PEOPLE'S DEMOCRATIC REPUBLIC OF ALGERIA

MINISTRY OF HIGHER EDUCATION AND SCIENTIFIC RESEARCH

ABD EL HAMID IBN BADIS MOSTAGANEMUNIVERSITY

FACULTY OF FOREIGN LANGUAGES

DEPARTMENT OF ENGLISH

Investigating the Effects of Video-Based Learning on Students' Cognitive Load

Case of First Year LMD Students in the Department of letters and Foreign Languages at Si El-Haoues University Center, Barika, Batna

Thesis Submitted in Partial Fulfillment of the Requirement for the Degree of Doctorate in Didactics and Applied Linguistics

Presented By: Asma HOUICHI **Supervised by: Dr. Dallel SARNOU**

Board of Examiners:

Prof. Hanane SARNOU	University of Mostaganem	**Chairperson**
Dr. Dallel SARNOU	University of Mostaganem	**Supervisor**
Prof. Souad HAMERLAIN	University of Mostaganem	**Examiner**
Prof. Belabes OUARRAD	University of Sidi Bel Abbes	**Examiner**

2022

Declaration

I hereby declare that this submission is my own work to the best of my modest knowledge. Any contribution to this reserved research by others I have worked with is explicitly acknowledged. I also certify that the intellectual content of this thesis is the product of my own work except for the sources and assistance received from others which are accredited.

Asma HOUICHI

Abstract

Technology has affected all aspects of our lives including the way of learning and teaching. Nowadays, it plays a great role in facilitating many activities and developing multiple skills. In the field of foreign languages teaching and learning, in particular, a number of approaches, methods, and techniques have brought about a myriad of significant changes along with the evolution of technology so that teachers may benefit from the use of new trends in their classroom. These trends, particularly those related to multimedia, can be harnessed to improve the efficiency of foreign language teaching and learning by lessening the load students experience while processing new information. In this connection, the present study aims to investigate the effects of integrating video-based learning as a tool to minimize the cognitive overload of EFL first-year LMD students' compared to text-based learning at Si El Haoues University Center, Barika. The study entailed a quasi-experimental design via a mixed-methods approach. To carry out this research, the sample included 101 students conveniently selected: 50 and 51 participants for each experimental and control group, respectively. The former was taught using video-based learning, while the latter was taught via text-based learning. To gather the required data, four tools were used; a post-test was administered in order to measure the participants' academic performance; a self-reported questionnaire (NASA-TLX) was given to measure the participants' mental workload they have experienced while watching the video; a post-treatment questionnaire was administrated to the experimental group to delve into their perceptions of the treatment and, lastly, reflective journals were conducted by the researcher throughout the experiment to journal whatever related to the experiment. For five weeks with six sessions of experimentation, post-test findings demonstrated a significant difference between the students' level of cognitive load, and thereby their academic performance. Furthermore, members of the experimental group perceived the treatment as highly satisfying. The interpretation of the findings indicated that there was a relationship between students' understanding of the content presented via videos and their level of cognitive load. As matter of fact, the researcher contends that videos represent an effective tool to deliver courses while seeking to reduce students' cognitive overload and to improve their academic performance.

Keywords: cognitive load, EFL learners, video-based learning, text-based learning.

Dedication

I dedicate this work to:

My dear loving parents, "**Fayrouz** and **Abd El-Hamid**" thank you for giving me all the love, encouragement, and support throughout my whole life. You have always been there to pursue my educational career, no matter the hard circumstances.

My caring siblings; Imen, Islam, Ilyes, and Assil

My lovely **Dr. "Tahari Nadjia",** who has been my best friend throughout my life and

Dr. "Tahari Aissa", who has unquestionably believed in me and endorsed me toachieve my ambitions.

All my family members, for their support and encouragement.

The two beloved persons who have meant and still mean a lot to me. My maternal grandmother and grandfather who raised me and whose love for me knew no bounds. I will never forget you and I will make sure your memory lasts as long as I live. I love you and miss you beyond words.

Acknowledgements

I would like to thank Allah for His blessings and for strengthening me. He has been the source of my inspiration, wisdom, knowledge, and understanding.

Undertaking this PhD has been a truly life-changing experience for me, and it would not have been possible without the valuable guidance of a number of persons to whom I would like to express my gratitude for their contributions to the success of the present study in many ways.

Warmest appreciation goes to the esteemed board of examiners, **Prof. "Hanane Sarnou" Prof. "Souad Hamerlain"**, and **Prof. "Belabes Ouarrad"**, for their time and efforts to supply constructive comments and evaluations through which this modest work was ameliorated and refined.

First and foremost, I am extremely grateful to my supervisor, **Dr. Dallel Sarnou** for her helpful advice, consistent support, and guidance during the running of this project. Her immense knowledge and wealth of experience have inspired me throughout my academic research. Without her encouragement, enthusiasm, and patience this work would not have been achievable. It has been an honor to be her doctorate student.

I would like to express my sincere gratitude to **Prof. Sarnou Hanane**. Her treasured advice and wise guidance have aided me throughout all the years of my doctoral studies. I would also like to evince my thanks to the teachers' team of the "DSPM" Lab at Abd El Hamid Ibn Badis University, for their insight and knowledge. I would like to offer a special thanks to **Dr. Tahari Nadjia**; Batna University and **Dr. Tahari Aissa**; Blida University for their assistance at every stage of the research project as well as for their unwavering support and belief in me.

My deepest appreciation goes to the participants who took part in the research and made it possible. I would like to extend my gratitude to the teachers, colleagues, and the administrative staff at Barika University Center for their assistance and generosity.

List of Acronyms and Abbreviation

APA: the American Psychological Association.

BFG: Big Friendly Giant.

CAT: Computer Axial Tomography.

CL: Cognitive Load.

CLT: Cognitive Load Theory.

CLT: Communicative Language Teaching.

CLTML: Cognitive Load Theory Multimedia Learning.

EFL: English as a Foreign Language.

ELT: English Language Teaching.

FLT: Foreign Language Teaching.

ICTs: Information **C**ommunication Technology.

LMD: License, Master, Doctorate.

MRI: Magnetic Resonance Imaging.

NASA-TLX: NASA Task Load Index.

Net-Gen: Net Generation.

PET: Positron Emission Tomography.

SPSS: Statistical Package for Social Sciences.

TEFL: Teaching English as a Foreign Language.

TESL: Teaching English as a Second Language.

UNESCO: the United Nations Educational Scientific and Cultural Organization.

VLE: Virtual Learning Environment.

WWW: World Wide Web.

List of Tables

Table 2.1 Video Materials Description 108
Table 3.1 General English Levels According to Placement Test 135
Table 3.2 Placment Test Description Statistics 136
Table 3.3 Placement Test Experimental group/Control Independent Sample T-Test 137
Table 3.4 Descriptive Statics of the First Post-test of the Experimental and Control Groups140
Table 3.5 Independent T-Test of the First Post-test of the Experimental/Control Groups 141
Table 3.6 Descriptive Statistics of the Second Post-test of the Experimental and Control Groups 142
Table 3.7 Independent T-Test of the Second Post-test of the Experimental and Control Groups 143
Table 3.8 Descriptive Statistics of the Third Post-test of the Experimental and Control Groups 144
Table 3.9 Independent T-Test of the third Post-test of the Experimental and Control Groups 145
Table 3.10 Description of the Fourth Post-test of the Experimental and Control Groups 146
Table 3.11 Independet T-Test of the Fourth Post-test of the Experimental and Control Groups 147
Table 3.12 Descriptive Statistics of the Fifth Post-test of the Experimental and Control Groups 148
Table 3.13 Independent T-Test of the Fifth Post-test of the Experimental and Control Groups 149
Table 3.14 Descriptive Statistics of the Sixth Post-test of the Experimental and Control Groups 150
Table 3.15 Independent T-Test of the Sixth Post-test of the Experimental and Control Groups 151
Table 3.16 NASA-TLX Data Summary for Session One 159
Table 3.17 NASA-TLX Data Summary for Session Two..... 160
Table 3.18 NASA-TLX Data Summary for Session Three..... 161
Table 3.19 NASA-TLX Data Summary for Session Four 162
Table 3.20 NASA-TLX Data Summary for Session Five..... 163
Table 3.21 Summarized Data of the Teacher's Reflective Journals 175
Table 3.22 Cronbach Alpha Reliability..... 181

List of Figures

Figure 2.1 Screenshot of the Video Used in the Pilot study..... 110
Figure 2.2 Screenshot of the Video Used in the First Session..... 111
Figure 2.3 Screenshot of the Video Used in the Second Session 112
Figure 2.4 Screenshot of the Video Used in the Third Session..... 113
Figure 2.5 Screenshot of the Video Used in the Fourth Session 114
Figure 2.6 Screenshot of the Video Used in the Fifth Session 115
Figure 2.7 1 Screenshot of the Video Used in the Sixth Session..... 116
Figure 3.1 Placement Test Means..... 136
Figure 3.2 Weighted Subscale Ratings of the Workload for Session One..... 159
Figure 3.3 Weighted Subscale Ratings of the Workload for Session Two 160
Figure 3.4 Weighted Subscale Ratings of the Workload foe Session Three..... 161
Figure 3.5 Weighted Subscale Ratings of the Workload for Session Four..... 162
Figure 3.6 Weighted Subscale Ratings of the Workload for Session Five..... 163
Figure 3.7 Weighted Subscale Ratings of the Workload for Session Six 164
Figure 3.8 Participants' Gender..... 182
Figure 3.9 English Learning Experience at the University 182
Figure 3.10 Watching English Videos 183
Figure 3.11 Kinds of Videos..... 183
Figure 3.12 Learning Through Videos..... 184
Figure 3.13 Learners' Perceptions towards Watching English Videos..... 184
Figure 3.14 Students' Perceptions toward Watching Educational Videos 185
Figure 3.15 Students' Perceptions of Educational Videos Compared to Lecturing..... 188
Figure 3.16 Students' Perceptions of their Cognitive Load when Watching Videos..... 191

List of Appendices

Appendix A Permission to Conduct a Research

Appendix B Placement Test

Appendix C Consent to Participate in a Research Study

Appendix D Post-test of the Pilot study "How can more women get into politics?"

Appendix E First Post-test "Can and will: Gwyn Haslock"

Appendix F Second Post-test "The BFG"

Appendix G Third Post-test "Windsor Castle"

Appendix H Fourth Post-test "Yusra Mardini, a young refugee"

Appendix I Fifth Post-test "International Women's Day – We are women"

Appendix J Sixth Post-test "Routemaster''

Appendix K The NASA Task Load Index

Appendix L Rating Scale Definitions

Appendix M Pilot Testing the Likert Scale Questionnaire

Appendix N Students Questionnaire

Appendix O Reflective Journals Checklist

Table of Contents

Abstract I

Dedication II

Acknowledgements III

List of Acronyms IV

List of Tables VI

List of Figures VII

List of Appendices VIII

Table of Contents IX

General Introduction 1

1. **Background of the Study** 1
2. **Significance of the Study** 3
3. **Research Questions** 3
4. **Research Hypothesis** 3
   - 4.1. **Null Hypothesis:** 4
   - 4.2. **Alternative Hypothesis** 4
5. **Objectives of the Study** 4
6. **Research Methodology** 4
   - 6.1. **Research Instruments** 4
   - 6.2. **Population and Sampling Techniques** 5
7. **Conceptual Definitions of Key Terms** 6
   - 7.1. **Video-Based Learning** 6
   - 7.2. **Cognitive Load Theory** 7
8. **Organization of the Thesis** 8

Chapter One: Theoritical Background 9

- **1.1 Introduction** 11
- **1.2 Section One: Cognitive Load** 11
  - **1.2.1 Cognitive Psychology** 11
  - **1.2.2 Human Memory Mechanisms** 13
  - **1.2.3 Definition of Memory** 14
  - **1.2.4 Types of Memory** 14
    - **1.2.4.1 Sensory Memory** 14
    - **1.2.4.2 Working Memory** 15

1.2.4.3 Long-Term Memory 17
1.2.5 Memory Problems 19
1.2.6 Information Processing 19
1.2.7 Definition of Cognitive Load 21
1.2.8 Cognitive Load Theory 22
1.2.9 History of Cognitive Load Theory 24
1.2.10 Types of Cognitive Load 25
1.2.10.1 Intrinsic Cognitive Load 26
1.2.10.2 Extraneous Cognitive Load 27
1.2.10.3 Germane Cognitive Load 29
1.2.11 The Way Cognitive Load Works 30
1.2.12 Measuring Cognitive Load 31
1.2.13 Reducing the Cognitive Load 34
1.3 Section Two: Video-Based Learning 40
1.3.1 Technology in Language Teaching and Learning 40
1.3.2 The Importance of Technology in Language Teaching and Learning 43
1.3.3 Teachers' Attitudes towards Technology 46
1.3.4 Students' Attitudes towards Technology 48
1.3.5 Video as a Multimedia Learning Tool 49
1.3.6 Types of Videos 51
1.3.7 Listening Skill and Multimedia 52
1.3.7.1 Listening and Comprehensible Input Theory 53
1.3.7.2 Multimedia Material Supporting Listening 54
1.3.8 Strategies for the Incorporation of Videos in the Classroom 57
1.3.9 Techniques for Video Implication in the Classroom 61
1.3.9.1 Active Viewing 61
1.3.9.2 Sound on and Vision off Activity 61
1.3.9.3 Freezing Framing and Prediction 62
1.3.9.4 Silent Viewing 62
1.3.9.5 Repetition and Role-Play 62
1.3.9.6 Reproduction Activity 62
1.3.9.7 Dubbing Activity 63
1.3.9.8 Follow-Up Activity 63
1.3.10 Teacher's Role in Video-Based Classroom 63
1.3.11 The Goals of Teaching with Videos 64
1.3.11.1 Authenticity 65

1.3.11.2 Culture 66
1.3.11.3 Motivation 67
1.3.12 Advantages of Video Use in EFL Classroom 68
1.3.12.1 Listening Skills 68
1.3.12.2 Speaking Skills 69
1.3.12.3 Content Comprehension 70
1.3.12.4 Vocabulary Retention 71
1.3.12.5 Language Proficiency 71
1.3.13 Potential Limitations to Video Use 71
1.4 Conclusion 73
Chapter Two: Research Methodology 74
2.1 Introduction 76
2.2 Research Design 76
2.2.1 Quasi-Experimental Research Design 77
2.2.2 Post-test Only Control Group Design 78
2.2.3 Quantitative and Qualitative Methods 81
2.2.3.1 Quantitative Methods 81
2.2.3.2 Qualitative Methods 82
2.2.4 Mixed-Method Approach 83
2.2.5 Triangulation Design 85
2.3 Research Setting 87
2.4 Participants 88
2.5 Data Collection Instruments 89
2.5.1 Placement Test 90
2.5.2 Post-test 91
2.5.2.1 Description of the Post-test 92
2.5.2.2. Post-test Scoring Scale 95
2.5.3 NASA-TLX Questionnaire 95
2.5.4 Post-Treatment Questionnaire 96
2.5.4.1 Questionnaire Validity 98
2.5.4.2 Questionnaire Reliability 99
2.5.4.3 Pilot Testing the Questionnaire 100
2.5.5 Reflective Journals 101
2.6 Data Collection Procedures 103
2.6.1 Placement Test 103

2.6.2 Post-test 104
2.6.3 NASA-TLX Questionnaires 104
2.6.4 Post-Treatment Questionnaire 105
2.6.5 Reflective Journals 106
2.7 Materials Used in the Study 106
2.7.1 Description of the Video Materials 106
2.7.2 Length of the Video Materials 107
2.7.3 Content of the Video Materials 109
2.8 The Experimental Experience 116
2.8.1 Pre-Experimental Phase 117
2.8.2 Experimental Phase 120
2.8.2.1 Session One 120
2.8.2.2 Session Two 121
2.8.2.3 Session Three 123
2.8.2.4 Session Four 124
2.8.2.5 Session Five 125
2.8.2.6 Session Six 126
2.8.3 Post-Experimental Phase 127
2.9 Data Analysis Procedures 127
2.9.1 Analysis of the Quantitative Tools 128
2.9.2 Analysis of the Qualitative Tool 128
2.10 Validity of the Research Design 129
2.10.1 Internal Validity 129
2.10.2 External Validity 130
2.11 Pilot Study 131
2.12 Ethical Consideration 132
2.13 Conclusion 133
Chapter Three: Data Analysis, Interpretations & Discussions 134
3.1 Introduction 135
3.2 Analysis of the Exploratory Phase Findings 135
3.2.1 Placement Test 135
3.3 Analysis of the Experimental Phase Findings 137
3.3.1 Analysis of Quantitative Data 138
3.3.1.1 Analysis of the Post-test 138
3.3.1.1.1 Hypothesis Testing 138

3.3.1.1.1.1 The Independent Samples t-tests 138
3.3.1.2 Discussion of the Post-Test Findings 152
3.3.1.3 The Analysis of the NASA-TLX Questionnaire 158
3.3.1.4 The Discussion of the NASA-TLS Questionnaire Findings 165
3.3.2 Analysis of Qualitative Data 167
3.3.2.1 Analysis of the Reflective Journals 167
3.3.2.2 Discussion of Reflective Journals Findings 176
3.4 Analysis of the Post Experimental Phase Findings 180
3.4.1 Analysis of the Post-Treatment Questionnaire 180
3.4.1.1 Questionnaire Reliability 181
3.4.1.2 Demographic Information 181
3.4.1.3 Section One 185
3.4.1.4 Section Two 188
3.4.1.5 Section Three 191
3.4.2 Discussion of the Post-Treatment Questionnaire Findings 193
3.5 Conclusion 200
Chapter Four: Pedagogical Implications, Recommendations 201
4.1 Introduction 202
4.2.1 Implications for Syllabus Designers and Policy Makers 202
4.2.2 Implications for Teachers 204
4.3 Recommendations 206
4.4 Limitations of the Study 209
4.5 Delimitations of the Study 210
4.6 Conclusion 210
General Conclusion 211
References……214
Appendices 237
Résumé 260
ملخص……261

General Introduction

1. Background of the Study

Technology has always been a fundamental part of the teaching and learning environment. At the present time, it is a vital part of the instructor's teaching tools in facilitating numerous activities and developing multiple skills. Since technology has become an integrated part of our daily lives, it is time to rethink innovative methods and approaches to incorporate technology into teaching and learning foreign languages. Consequently, EFL teachers may benefit from using new trends in their classroom activities, such as integrating audio-tracks, audio-visual aids, or videos. These trends can be harnessed to improve the effectiveness of foreign language learning skills.

Video-based learning is recognized as a powerful learning resource in online teaching activities. It has unique features that make it an effective learning method that can enhance and partly replace traditional learning approaches. Video-based learning can change the way of learning as well as the way of teaching. Also, it can help students visualize how something works, showing information and details difficult to explain bytext or photos. Besides, using videos attract students' attention and support different learning styles, specifically visual learners, thus achieving better learning outcomes (Dudeney & Hockly, 2012).

Video-based learning has a long tradition as a learning method in educational classes. It was initially used during the Second World War when soldiers were trained with a combination of audio and film strips. Later, by the late 1960s, educational television was used as a tool in classrooms, and in the 1980s, videotapes made it much easier to use videos in classrooms. In the mid 1990s, digital video CDs added multimedia control and assessment tools by using the video on a computer. Then by the 2000s, classrooms connected to the internet and interactive digital video and video conferences became possible. Since then, new technologies such as Smart phones and tablets in combination with social media such as Facebook have contributed to increasing social interaction and have made it easier to integrate video applications into education.

Videos, in fact, are one of the most interesting materials applied to language learning and teaching. Egbert (1991) suggests that integrating authentic materials such as videos in language instruction became quite necessary for foreign language learners to develop their

learning process. Sherman (2010) believes that the recent method to learn EFL/ESL is by using videos either in the classroom or at home. Therefore, just as in many English teaching situations, the teacher plays a crucial role in using the video as an aid for language teaching, for s/he has the main responsibility for creating a successful language learning environment.

Cognitive load refers to the total mental effort it takes to process information related to reasoning, problem-solving, and decision-making (Sweller, 1994). This information is stored in the working memory, which that is part of the short-term memory in which the former has a small capacity for holding information. In other words, cognitive load is related to the amount of information that working memory can hold at one time. Sweller (1994) believed that since working memory has a limited capacity, instructional methods should avoid overloading it with additional activities that do not directly contribute to learning.

The idea of cognitive load was first developed in 1998 by an educational psychologist called John Sweller in his publication "*Cognitive Load Theory, Learning Difficulty, and Instructional Design*". Sweller (1994) asserts that because short-term memory is limited, learning experiences should be designed to reduce working memory load in order to promote schema acquisition. The Cognitive Load Theory (henceforth CLT) was described as a theory that aims to understand how the cognitive load produced by learning tasks can impede students' ability to process new information and create long-term memories.

Cognitive load is typically increased when unnecessary demands are imposed on a learner, making the task of processing information overly complex such as the unnecessary distractions of a classroom. When the cognitive load is managed well, students can learn new skills easier than when high cognitive load interferes with the creation of new memories (Paas, Renkl, & Sweller, 2003). The theory has been designed to afford guidelines intended to support the presentation of information in a way that encourages learner activities that optimize intellectual performance.

Being a powerful learning resource, the current research will investigate the impacts of video-based learning presentations on the cognitive load of EFL learners since it is related to the amount of information that working memory can hold.

2. Significance of the Study

In this research study, we will spotlight video-based learning presentations effects on EFL learners' cognitive load. The study identifies an effective way of presenting information to ensure learners' comprehension and ability to use their knowledge to solve additional problems like the ones related to comprehension and acquisition. The specific focus of the study is how the mode of presentation and, consequently, cognitive load affects the learners' language acquisition. In other words, compared to the traditional modes of presentations, video-based learning presentations are estimated to minimize the extraneous information and highlight germane information so that the learners' cognitive load is not overtaxed and the learning process is not thereby impaired. This research, furthermore, is designed to reveal the teachers' and learners' perceptions of the implementation of such presentations in EFL classrooms. Moreover, the rationale behind this examination is to consider the integration of video-based learning presentations as far as the benefits they offer are concerned on EFL learners' cognitive load in particular and their academic achievement in general.

3. Research Questions

The main research questions that provoked this research study are:

1) To what extent does the use of video-based learning presentations affect the cognitive load of EFL learners?
2) How would watching videos influence the cognitive load of EFL learners?
3) How would teachers perceive video-based learning?
4) What could be the learners' attitudes towards video-based learning?

4. Research Hypotheses

Because of the widespread of educational videos available online and offline and the debate on their effectiveness, this study will investigate and examine the effects of video-based learning on the cognitive load of EFL learners. Motivated by this query, the study hypothesizes that:

a. Null Hypothesis

- If video-based learning presentations are integrated, there will be no significant differences in EFL students' cognitive load in the experimental group compared to students in the control group.

b. Alternative Hypotheses

- If video-based learning presentations are integrated, there will be significant differences in EFL students' cognitive load in the experimental group compared to students in the control group.
- If video-based learning is used in the classroom, teachers will positively perceive it as an effective tool for language learning.
- If video-based learning is used in the classroom, EFL learners will have positive perceptions of language learning.

5. Objectives of the Study

The academic objectives of the current research study are as follows:

a. To investigate the extent to which video-based learning affects EFL learners' cognitive load capacity as well as their academic performance and whether EFL teachers could rely on it as an effective technique for language teaching and learning.

b. To unveil the significance of using videos in the classroom and their influence on EFL learners' cognitive load.

c. To reveal both EFL learners' and teachers' reactions toward Video-Based learning on reducing the cognitive load.

6. Research Methodology

a. Research Instruments

The process of gathering data in this investigation will be based on a combination of both qualitative and quantitative tools for collecting data in order to answer questions and test hypotheses, since this integration will provide a better understanding of the case than either of each alone and its nature will be experimental, this means that two groups will bechosen for this study (the experimental group and the control group).

First, quantitative tools based on numerical data will be presented statically, including post-test design in order to investigate the effect of video–based learning presentations on the cognitive load of learners. Accordingly, control and experimental presentations are set to determine the effect of the video-based learning presentation on learners' recall of the information presented. The study is designed to measure each learner's performance on the control against their own performance in the experimental presentation. Thereby the NASA-TLX questionnaire was deployed in order to account for differences in experience, cognitive capacity, enthusiasm, and understanding. Additionally, the cognitive load questionnaire (NASA-TLX) is to be conducted after each learning activity to both groups. Another questionnaire (post-treatment questionnaire) is used for learners of the experimental group in order to know their attitudes and reflections vis-à-vis the integration of video-based presentations.

Second, a qualitative tool will be used in terms of teachers' reflective journals based on a checklist including a set of features to be followed. An in-depth description of the current learning situation will be provided; their reflections, opinions, students' progress and improvement concern the implementation of video-based learning.

Mixing both methods, as a consequence, will provide a more holistic picture of the outcomes.

b. Population and Sampling Techniques

The selected population for this study is English as a foreign language learners (EFL) first-year LMD students in the department of Letters and Foreign Languages at Barika University Center in particular. The reason behind this choice is the fact that since the purpose of the study is to investigate the effects of video-based learning on learners' cognitive load, it would be better to test its effectiveness on primary levels (beginners); therefore, if this technique shows effectiveness, video-based learning would be suggested to be part of the set of tools for language teaching and learning for this population and for higher levels, and even other subjects.

The sample is selected conveniently; one class represents the experimental group that receives the treatment that integrates of the video-based learning presentations, and another class represents the control group which is unlike the experimental group taught through the text-based presentations.

7. Conceptual Definitions of Key Terms

7.1. Video-Based Learning

Video-based learning literally refers to learning experiences facilitated through video. With its ability to combine camera footage, animation, graphics, text, and audio, videos create a multisensory learning experience, unlike any other e-learning format. Because of this, it is no surprise that video-based learning is quickly becoming a dominant standard of online training. Recently, video usage has enhanced over the past decade to become one of the most common forms of learning. P. Chandler (2009) identifies educational video as an effective strategy that enables learners to gain knowledge because of its capacity to present multiple representations, dynamic and meaningful learning content (P. Chandler, 2009).. Asokhia (2009) emphasizes that video materials are a form of audio-visual aidsthat allow students to learn a foreign language by simultaneously listening and watching.

Along the same line of thought, videos are considered vital tools in foreign language teaching due to their association with communicative language teaching in addition to their role in facilitating language learning (Richard E. Mayer, 2005). In fact, it is documented that the use of video materials in EFL classes would present the target language naturally, facilitate learning, and motivate students with a lack of practice opportunities and exposure to native speakers. Moreover, it appears that EFL students who have studied English language courses in formal settings suffer from less use of the language and the understanding of its use in normal communication either in the written orthe spoken mode. As a result, due to the growing focus on communicative techniques, the use of videos in English classes has increased rapidly in recent years. For example, the role of video materials in bringing authenticity, motivation, and variation to the classroom that traditional textbooks cannot offer, has been explored in several studies (Sherman, 2003). The following sections outline the different goals of using videos in EFL classes.

7.2. Cognitive Load Theory

In cognitive psychology, cognitive load refers to the total amount of working memory resources used. That is to say, cognitive load is the total mental effort it takes to process information related to learning, reasoning, and decision-making in any one instant (Chandler & Sweller, 1991). The previous processes are the same aspects an individual's brain uses, for example, to peruse a material that is stored in the working memory. Cognitive load reveals a person's working memory capacity since it is susceptible to overloading while handling difficult information (Sweller, 1994). Cognitive load is, fundamentally, a resource demand by the information and brain. Working memory has an essential role in a person's learning process, but it has a limited capacity; it is open to overload, mainly when students are learn new complicated ideas. In such a case, the learner has to apply additional efforts to process the information.

As stated in the Annual Conference Society for Technical Communication 2006), Tracy and Albers (2006) declare that "cognitive load refers to the overall amount of mental activity on working memory at an instance in time" (Tracy & Albers, 2006); if a person is required to hold lots of items in short term memory, he or she will not succeed because short-term memory is limited in the number of elements it can hold simultaneously. However, usability is increased when a person's working memory is accessible to concentrate on the information to be used (Tracy & Albers, 2006).

Cognitive Load Theory, however, is based upon the idea that individuals' working memory can only deal with a limited amount of information at one time. The theory suggests that if the cognitive load exceeds learners' processing capacity, the task will not be completed successfully (Sweller, 1994). That is to say, the theory asserts that learning is vulnerable when working memory capacity is exceeded in a learning task. Sweller (1994) describes the idea as: information should be presented at a pace and level of difficulty that corresponds to the way the human brain processes information.

John Sweller built a theory with a belief that learners' cognitive load increases because they have to process many factors at a time beside the actual knowledge they are trying to acquire. This makes it difficult for them to pay attention to necessary information and makes learning unnecessarily difficult. Consequently, learning becomes less effective because learners are incapable to pay necessary devotion to learning and memorizing due

to the increasing cognitive load (Chandler & Sweller, 1991). The CLT presents special ways in which teachers can decrease the students' cognitive load. Additionally, it recommends diverse teaching techniques and it ensures the formation and retention of new memories. The theory suggests that learners can learn effectively and retain information for a long time if the learning conditions and their cognitive nature are in perfect alignment with each other (F. Paas et al., 2003).

8. Organization of the Thesis

The present dissertation includes two main parts: theoretical and practical. First, a general introduction will provide an overview of both the theoretical and the practical underpinnings of the research. The first part will be the theoretical background, that is the first chapter, and it will contain two sections affiliated to the dependent variable (Cognitive Load) and the independent one (video-based learning). The second fraction is the practical part which will contain three chapters; one is dedicated to a detailed description of research methodology while the following chapter presents the results and interpretations, and the last chapter would provide a set of recommendations, implications and the general conclusion.

The first chapter presents an overview that will center upon exploring the theoretical background. The first section of the chapter one will be dedicated to cognitive load as it will deal with its definition, history, theory, types, measurement, and its importance in language learning etc. The next section will be devoted first to technology and the digital era in general, then to reviewing video-based learning features and strategies.

The second part of this research is about the field work. The second chapter will concern the practical phase through which data will be collected qualitatively and quantitatively via a variety of instruments in order to test the suggested hypothesis. As for the third chapter, the expatiation of results, data analysis and interpretation in relation to the theoretical background of the study will be handled in this chapter. At last, in chapter four, different pedagogical implications and recommendations will be proposed as far as the integration of the video-based learning.

Chapter One

Theoretical Background

Chapter One: Theoretical Background

1.1 Introduction

1.2 Section One: Cognitive Load

1.2.1 Cognitive Psychology

1.2.2 Human Memory Mechanisms

1.2.3 Definition of Memory

1.2.4 Types of Memory

1.2.4.1 Sensory Memory

1.2.4.2 Working Memory

1.2.4.3 Long-Term Memory

1.2.5 Memory Problems

1.2.6 Information Processing

1.2.7 Definition of Cognitive Load

1.2.8 Cognitive Load Theory

1.2.9 History of Cognitive Load Theory

1.2.10 Types of Cognitive Load

1.2.10.1 Intrinsic Cognitive Load

1.2.10.2 Extraneous Cognitive Load

1.2.10.3 Germane Cognitive Load

1.2.11 The Way Cognitive Load Works

1.2.12 Measuring Cognitive Load

1.2.13 Reducing the Cognitive Load

1.3 Section Two: Video-Based Learning

1.3.1 Technology in Language Teaching and Learning

1.3.2 The Importance of Technology in Language Teaching and Learning

1.3.3 Teachers' Attitudes towards Technology

1.3.4 Students' Attitudes towards Technology

1.3.5 Video as a Multimedia Learning Tool

1.3.6 Types of Videos

1.3.7 Listening Skills and Multimedia

1.3.7.1 Listening and Comprehensible Input Theory

1.3.7.2 Multimedia Material Supporting Listening

1.3.8 Strategies for the Incorporation of Video in the Classroom

1.3.9 Techniques for Video Implication in the Classroom

1.3.9.1 Active Viewing

1.3.9.2 Sound On and Vision off Activity

1.3.9.3 Freezing Framing and Prediction

1.3.9.4 Silent Viewing

1.3.9.5 Repetition and Role-Play

1.3.9.6 Reproduction Activity

1.3.9.7 Dubbing Activity

1.3.9.8 Follow-Up Activity

1.3.10 Teacher's Role in Video-Based Classroom

1.3.11 The Goals of Teaching with Videos

1.3.11.1 Authenticity

1.3.11.2 Culture

1.3.11.3 Motivation

1.3.12 Advantages of Video Use in EFL Classroom

1.3.12.1 Listening Skills

1.3.12.2 Speaking Skills

1.3.12.3 Content Comprehension

1.3.12.4 Vocabulary Retention

1.3.12.5 Language Proficiency

1.3.13 Potential Limitations to Video Use

1.4 Conclusion

1.1 Introduction

The first chapter offers significant information in order to have a comprehensive understanding of the research topic and the general context of the study. Moreover, it represents an overview that will center upon exploring the theoretical background. This chapter is divided into two main parts: 1) an overview of cognitive load, and 2) video-based learning. The first section is devoted to gain a satisfactory understanding of the cognitive load types, measurement, and functioning, with a particular emphasis on its reduction. In the second section, an attempt was made to include a review of some theoretical and empirical insights to identify the main features of video-based learning affecting the cognitive load.

1.2 Section One: Cognitive Load

1.2.1 Cognitive Psychology

For many decades, behaviorism was the most prominent movement in psychology. Behaviorists avoided the examination of cognitive phenomena because it was complex to define and measure (Gardner, 1985). Rather, they studied external and visible behaviors that were more open to scientific analysis. Cognitive psychology came as a revolution against behaviorism. This becomes evident when examining the basic assumptions of the cognitive movement. While behaviorists avoided studying the mental world and denied its existence, firmly, cognitivists acknowledged the existence of mental processes and focused their examination on them (Neisser, 2014). While Behaviorism considers the mind as a passive organ that functions according to simple rules of conditioning, cognitive psychology sees the mind as active, as selecting information from the environment, relating it to prior knowledge, and acting on the results of such processing.

During the 50's, revolutionaries began to work on cognitive psychology. Ulric Neisser, in 1967, was the first one who used the term cognitive psychology and published the first book on this issue. Cognitive psychology, according to him is "the study of knowledge representation and use in human beings" (Neisser, 2014, p. 4). It is concerned with the scientific study of the mind as an information processor and understanding how people represent, process, and store information. The American Psychological Association

(APA) defines cognitive psychology as being the study of higher mental processes such as attention, language use, memory, perception, problem-solving, and thinking (VandenBos, 2007). As a scientific study of mind and mental functioning, the core focus of modern cognitive psychology is on studying how people acquire, process, and store information within the human brain. Therefore, cognitive psychologists are most concerned with studying how individuals think, perceive, remember, forget, solve problems, focus, and learn.

Three major reasons were responsible for the rapid growth of this new perspective. The first reason was the failure of behaviorism to account for findings in areas such as language acquisition. For example, all children around the world have an innate capacity to generate language spontaneously and to utter the basic phonetic elements of language, and this capacity may not be under environmental control. The invention of new measuring tools to examine cognitive activities was the second reason for the rise of cognitive psychology. Mental processes during the era of behaviorism were not directly measured. After the rise of the cognitive movement, new devices emerged to provide a more accurate picture of mental processes. These tools included Positron Emission Tomography (PET), Computerized Axial Tomography (CAT), and Magnetic Resonance Imaging (MRI). Possibly, the thing that contributed most considerably to the decline of behaviorism was the rise of computers. The latter encouraged psychologists to start thinking more about them and realize that like a computer, the mind could be viewed as a device that represents and transforms information. Thus, computers accelerated the adoption of the information processing view in psychology particularly and in other cognitive science fields generally (Friedenberg & Silverman, 2011).

According to Neisser (2014), the term "cognition" refers to "all the processes by which the sensory input is transformed, reduced, elaborated, stored, recovered, and used" (p.4). He added: "it is concerned with these processes even when they operate in the absence of relevant stimulation, as in images and hallucinations. Such terms as sensation, perception, imagery, retention, recall, problem- solving, and thinking, among many others, refer to hypothetical stages or aspects of cognition" (Neisser, 2014). With that description, it is evident that cognition is involved in everything done by human beings; that is to say, every psychological phenomenon is a cognitive phenomenon, so it is concerned with all human activities rather than some fractions of it. The basic reason for studying cognitive

processes has become as clear as the reason for studying anything else. Cognition, like other psychological processes, can validly be studied in terms of the underlying neural events. Neisser (2014) claimed that human behaviors and consciousness depend on the brain's activities in relation to other physical systems. For instance, he asserts that everyone would agree that human beings store a great deal of information about their past experiences, and it is clear that this information must be physically embodied somewhere in the brain.

As opposed to other approaches in cognitive science that study animal and machine modes of information processing, cognitive psychology focuses on human information processing. Cognitive psychologists adopt the scientific method as their main tool of investigation and hypotheses are tested by analyzing data that has been obtained from controlled experiments (Friedenberg & Silverman, 2011). In the classical view of information processing, process models carry two assumptions. First, they are supposed to be sequential, i.e. information lying within one stage is processed before it is produced because information cannot be processed simultaneously in various stages. Second, while excluding input and output, the processing that occurs within one stage is independent of the processing that occurs within another stage (Gardner, 1985). Later on, the connectionist view challenged these assumptions of information processing and adopted a completely different architecture as the basis of cognition. Process models are an important part of the cognitive perspective. They are a powerful conceptual tool for understanding human information processes. In fact, the next section is devoted to describing a major processing domain in cognition; this is "memory".

1.2.2 Human Memory Mechanisms

Memory is how individuals perceive, store, retain, adapt to, and use the information delivered by their senses, language, and perception of the world (Sobel & Li, 2013). Memory has various types, including the type that lasts forever and the type of memory concerning sights we have seen and sounds we have heard. Also, there is a memory of tastes, and that of scents, and of sensations on our skin. These are memories of knowledge and events perceived directly through senses. However, these kinds of memory differ from those that humans acquired through the involvement of language. There are, as well, the

types of memory individuals are intentionally aware of, such as information of the email, phone number, in addition to this, the knowledge about a foreign language that is studied.

1.2.3 Definition of Memory

Memory, according to Friedenberg and Silverman (2011), "is the capacity to retain information over time. Memory is important to any information processing system, animal or machine, because it underlies the ability to learn; "memory allows people to store their past experiences and draw on them" (p.125-126). Memory is a crucial aspect of the cognitive skills; hence, any damages in memory will affect the other skills in general and learning in particular. Friedenberg and Silverman point out that there are a few qualities of the individual memory systems. They may consist, first, duration, which pertains to how long information remains feasible and viable in a memory system. The second characteristic is capacity that relates to the quantity of information that the memory system can hold. The next feature is coding, which refers to the specific kind of information the system contains (Friedenberg & Silverman, 2011).

Similarly, as cited in (Spielberger, 2004), "memory is one of people's most obvious cognitive abilities. Of all the mental abilities, people report complaints about this ability more often than about any other ability, probably because it is fundamental to most everyday tasks. Also, memory decline can be obvious when a person is attempting to recall necessary information such as trying to remember a phone number" (p.374). In simple words, memory seems to be a property of the human mind which refers to the ability to retain information and knowledge.

1.2.4 Types of Memory

Researchers have been debating the classification of memories for decades. What most experts believe is that humans have at least three different types of memory. All other subcategories of memory tend to fall into one of these three types.

1.2.4.1 Sensory Memory

In their book (2013), *The Cognitive Sciences,* Carolyn P. Sobel and Paul Li discussed the three types of memory. Starting with the sensory store, they note that "the sensory register of course records information coming from all the senses. It stores the

information after the stimulus has ceased but only very briefly, these senses received the most attention so far as vision and hearing" (p.68). In the same line of thought, Friedenberg and Silverman (2011) define the sensory memory as "a repository for incoming sensory information" (p.126). They add: "Raw, unanalyzed data that are derived from the senses are held here very briefly" (p.126). They believe that "the purpose of sensory memory is to maintain the representation of a stimulus long enough so that it can be recognized" (p.126). From these claims, it is apparent that sensory memory stores limited amounts of information for very short periods of time. That information is a preliminary impression of the external stimulus and decays quickly unless it experiences further processing.

Researchers continued to identify multiple forms for this kind of memory; they found that there is one for each of the five senses. Each of these forms has different characteristics. For instance, iconic memory pertains to the short persistence of a visual impression, and it lasts only for about 250 to 300 milliseconds. The information interpreted by the auditory system is stored for longer period than the first in the echoic memory because it is impossible to process a whole sentence, to understand its meaning, until one heard it all. The information perceived through the senses remains long enough, yet, for someone to pick out those aspects he or she needs to process (Shrestha, 2017). Nevertheless, not every single detail of what is happening at any given situation requires someone's awareness and attention. Therefore, once the elements of sensory information stored briefly, they will move to short-term memory.

1.2.4.2 Working Memory

The working memory is also known as short-term memory; these terms are used interchangeably. In 2011, Friedenberg and Silverman stated, "the information is briefly stored there. However, the duration of items residing in working memory is much longer than that of items residing in sensory memory. Working memory retains less information; its capacity is unlike the unlimited capacity of the visual icon" (p.127). With that being said, short-term memory stores information for longer periods of time, yet it is of a relatively limited capacity. The duration of time information remains in the short-term store depends on whether it undergoes rehearsal or not (Friedenberg & Silverman, 2011). Moreover, they added that "working memory is limited to storing just a small number of items. While information in the different sensory stores is specific to modality, coding in working memory can be acoustic, semantic, or visual" (p.127-128). Working memory

keeps information from few seconds up to one minute or two, and it has a limited information capacity. It is a place where information might be temporarily stored in order to be operated on by cognitive skills (Friedenberg & Silverman, 2011).

Supporting the previous claim, the short-term memory acts as a controller serving in new information and selecting specific processes for drawing information out of the long-term memory in order to explain the role of short-term memory. Thus, the prevailing technique individuals use to maintain information in short term storage is rehearsal. Friedenberg and Silverman (2011), reported "rehearsal is the mental repetition or mental practicing of some to-be-learned material. It is usually manifested as implicit speech or talking to oneself" (p.128). What a person does when he or she needs to remember someone else' address or email but cannot note it down. Friedenberg and Silverman added, "Rehearsal refreshes items in short-term memory; it keeps them active and prevents them from decaying" (Friedenberg & Silverman, 2011, pp. 128-129). That is to say, rehearsal is the repetition of items of information over and over again in the relatively permanent memory and every time an item is rehearsed is supposed to be committed into a relatively permanent long-term store.

In the same context, Wixted (2004) questioned why people forget even simple information and how they can keep themselves from forgetting?. Sometimes information does not reach long-term memory representation and leaves short-term store. This information will be lost forever since new items will constantly be coming in and drive out previous information from the limited short-term store. Forgetting in short-term store entails that there are simple information such as an address, an e-mail or names of people; individuals effortlessly forget after a short period of time. Working memory in language learning can be traced back to the 80's, Daneman and Green (1986) who showed how this aspect helped elementary school learners to get use of words. Furthermore, it was discussed in the chapter of interrelations of language and cognitive development (2014), the book of *Encyclopedia of Language Development:*

> *Once children are old enough to form and process utterances usually 18 to 30 months, limitations on working memory will affect comprehension, production, and learning. In pre-school and school-aged children, verbal working memory predicts word learning and reading comprehension. Interpretation of this correlation is difficult, however. Verbal working memory seems to be a*

specialized resource for language processing. However, there is some evidence that working memory for musical sequences and for non-native speech correlates with language abilities including word learning. Learning and memory for linguistic sequences is distinct from learning and memory of nonlinguistic sequences. There is some relation between working memory resources and language abilities, including language learning, but the nature of the relation is not well specified (Brooks & Kempe, 2014, p. 287).

1.2.4.3 Long-Term Memory

Individuals are capable of remembering information for longer than just a couple of seconds. Many people can remember quite brightly events from their childhoods, their own names, where they lived as a children, how to ride a bicycle. Furthermore, they can retain information of where they were five minutes ago or even information learned years ago, where they went in summer holidays last year, are all supposed to belong to the long-term memory. Michelon (2012) claimed that long-term memory is another memory storage which is capable of storing data for lengthier periods of time.

Having briefly considered the sensory register and short-term memory systems, an endeavor is turned to the last component of the system; long-term memory. Long-term memory has a large information capacity and it is capable of storing information for a much extended period of time. Long-term store is supposed to be an infinite, relatively permanent storage system (Sobel & Li, 2013). Yet, how does information pass into long-term memory? Atkinson and Shiffrin indicate that "information in the short-term store is constantly being transferred in some measure to the long-term store but that control processes the individual engages in affect the transfer" (as cited in Sobel & Li, 2013, p.73).

In the same context, people try to retrieve memories so as to connect them to new information, thus, reinforcing them. i.e. the more often individuals retrieve a specific piece of information, the stronger their memories traces become (Sobel & Li, 2013). Moreover, information has to be held first in short-term memory for some time, and then transferred to long-term stores. On the one hand, when people rehearse items, the transfer of those items occurs. On the other hand, in order to achieve long-term storage, information has to be held in short-term memory first.

Long-term memory has a number of distinct sorts. Friedenberg and Silverman (2011) point out that the first sort is Procedural memory; "it holds procedural knowledge. It is memory for skill, it is demonstrated by doing, and arises without conscious recall" (p.131). In other words, when a person recognizes that sometimes he or she learns a skill and how to perform it, such as riding a bicycle, and forgets how to do it, the unconscious nature of this memory becomes clear and shows improvement when he or she attempts to perform the action; this type of memory is referred to as implicit memory (Friedenberg & Silverman, 2011).

Declarative memory is the next type of long-term storage. Friedenberg and Silverman note that "it is memory for facts and events, it is demonstrated by speaking, and arises with conscious recall" (p.131). There are two kinds of declarative memory. The first kind called semantic memory. This is "knowledge of facts and general knowledge of the sort learned in school" (Friedenberg & Silverman, 2011, pp. 131-132). It reflects someone's general world knowledge. It consists of their memory facts that are not distinctive to them and not recalled in any specific temporal situation. The second kind is episodic memory; it is viewed by Friedenberg and Silverman (2011) as personal experiences that "contain episodes, or personally experienced events. Individuals are consciously aware of declarative information which is sometimes referred to as explicit memory" (p.132). This means that episodic memory represents personally experienced events or episodes, which are the kind of memory people use when they learn meaningless lists of words, or when they need to recall something that occurred to them at a particular time or in a particular context (Friedenberg & Silverman, 2011).

Another question Friedenberg and Silverman (2011) discussed is about capacity, i.e. how much individuals retain in semantic long-term memory. Humans can remember everything they have ever experienced in their entire lives, yet they simply have difficulties when it comes to recalling. Therefore, this lack of ability to remember could be due to a failure in getting it out (Friedenberg & Silverman, 2011). Landauer (1986), approximates that "the average adult has about a billion bits of information in memory and a storage capacity that is perhaps one thousand to one million times greater than that" (as cited in Friedenberg and Silverman). Nevertheless, Friedenberg and Silverman (2011) doubt this estimation because they believe that the failure to recall information in a memory test can be owing to either retrieval breakdown or decay.

The next feature that Friedenberg and Silverman explains is coding; they accept as true that "information in long-term memory is represented in various formats. Implicit memories may be stored in the form of production rules. Explicit memories may be stored as networks of connected nodes, that represent facts or events which are linked to others" (Friedenberg & Silverman, 2011, p. 133).

1.2.5 Memory Problems

One of the problems related to memory in which human beings usually face is language loss. Levy (1994) demonstrated that language loss may occur in a variety of situations. For example, when someone is bilingual, he or she tends to use one of the languages thoroughly rather than the other. Sobel and Li (2013) noted that "the language used significantly less may become less available to the individual. A loss of the individual's native language is referred to as first language attrition; the loss of a language acquired subsequent to one's native language is known as second language attrition" (p.299-300). Many humans encounter this type of language loss when they learn a language but fail to make use of it because this language seems to disappear and fade after they have left school.

In addition, Sobel and Li (2013) point out that "language loss occurs in people who have suffered brain damage either through disease, such as Alzheimer's disease or brain tumor, or through trauma, such as a stroke or a blow to the head. The condition these people exhibit is known as aphasia. As an infant is one who has not yet developed a linguistic system, an aphasic is one who, through brain damage, has lost some or all of the linguistic system he or she once had in fully developed form" (Sobel & Li, 2013, p. 300).

1.2.6 Information Processing

Though the information that learners have to process differs on many dimensions, the extent to which appropriate elements interact is a critical aspect. Sweller indicates that information varies on a range from low-element interactivity to high-element interactivity. Chandler and Sweller (1991) insisted that each element of low-element interactivity material can be understood and learned individually without consideration of any other elements. Human cognitive construction has met this requirement by its combination of working and long-term memory. Working memory, as stated earlier, is the part of the

person's brain in which all conscious cognitive processing occurs (Foster, 2009); it is able to dominate everything related to learning. Friedenberg and Silverman (2011) argue that working memory has a small capacity; it can handle only a very limited number, that is from four to five bits of information at one time with a short duration which last only around ten seconds. This number is far below the number of interacting elements that occurs in most substantive areas of human mental activities. Alone, working memory would only allow quite minor human cognitive activities.

Unlike working memory, long-term memory appears to have an unrestricted capacity. It provides humans with the ability to greatly expand the processing ability (Sobel & Li, 2013). This memory store can contain huge numbers of schemas; which are mental structures that are used to organize and structure knowledge. Foster (2009) argued that schemas integrate multiple elements of information into a single element with a specific function. It can be brought from long-term to working memory. Human beings are able to construct new schemas in working memory so they can be incorporated into existing knowledge in long-term memory. The existing knowledge in long term memory is brought into working memory to aid individuals understand the world.

Working memory might, for example, only deal with one element that may consist of a large number of lower levels interacting elements. Sometimes learning involves great effort. That is because working memory is quite vulnerable to overload (F. Paas, Renkl, & Sweller, 2003), which occurs as persons study increasingly complex subjects and perform increasingly complex tasks. This complex set of interacting elements can be manipulated in working memory because of schemas held in long-term memory. Sweller believed that high cognitive load is also strongly influenced by the number of elements in working memory that interact with each other. Those interacting elements may far exceed working memory capacity if each element must be processed simultaneously. Their incorporation in a schema means that only one element must be processed. Through this process, human cognitive architecture handles complex materials that exceed the capacity of working memory. Accordingly, element interactivity; the manner in which information is presented to learners and the learning activities required for learners can also impose a cognitive load (F. Paas et al., 2003).

1.2.7 Definition of Cognitive Load

Scientists (Chandler & Sweller, 1991; Fred G Paas, 1992; Sweller, 1994) agreed that a given information holds something called "*Cognitive Load"* (CL) when it comes into the individual's brain via the working memory. In cognitive psychology, cognitive load refers to the used amount of working memory resources. That is to say, cognitive load is the total mental effort it takes to process information related to learning, reasoning and decision-making in any one instant (Chandler & Sweller, 1991) which are the same aspects an individual brain's use to peruse a website or use an app that are stored in the working memory.

Cognitive load reveals a person's working memory capacity since it is susceptible to overloading while handling difficult information (Sweller, 1994). Cognitive load is, fundamentally, a resource-demand by the information and brain. Working memory has an essential role in a person's learning process, but it has a limited capacity; it is open to overload, mainly when learners are learning new complicated ideas. In such a case, the learner has to apply additional efforts to process the information.

As stated in the Annual Conference Society for Technical Communication 2006), Tracy and Albers (2006) declared that "cognitive load refers to the overall amount of mental activity on working memory at an instance in time" (Tracy & Albers, 2006); if a person is required to hold lots of items in short term memory, he or she will not succeed because short-term memory is limited in the number of elements it can hold simultaneously. However, usability is increased, when a person's working memory is accessible to concentrate on the information to be used (Tracy & Albers, 2006). For instance, online documentation provides a restricted view of long documentation. Several website designs are barriers to be overcome; they compel a high cognitive load with poor navigation. Nonetheless, users have to concentrate on the information that of interest to them because the cognitive resources are drawn away from their primary task of finding and comprehending the site's information.

Supporting Sweller's views, Yang (2014) argues that knowledge has to be triggered to be retrieved from the long-term memory and then information is processed in the working memory; thus, a relation is established between the received message and the prior one. Comprehension and retention of the input can be enhanced through further

explanations and illustrations. Since the working memory capacity is restricted, simultaneous transmission of inputs via several channels would overload a learner's memory capacity and negatively affect comprehension. Consequently, the general cognitive load should not exceed the general working memory capacity.

1.2.8 Cognitive Load Theory

Cognitive Load Theory (henceforth CLT) has become one of the most popular teaching theories over the last years. It is considered as the "next big thing in teaching". Sweller's theory enables both teachers and learners, respectively, to teach and learn effectively by reducing the cognitive load. According to Sweller (1994), CLT is based upon the idea that individuals' working memory can only deal with a limited amount of information at one time. The theory suggests that if the cognitive load exceeds learners' processing capacity, the task will not be completed successfully (Sweller, 1994). That is to say, the theory asserts that learning is vulnerable when working memory capacity is exceeded in a learning task. Sweller (1994) described the idea as, information should be presented at a pace and level of difficulty that corresponds to the way the human brain processes information.

This particular theory suggests that learning takes place best under circumstances aligned with human cognitive design. George Miller's information processing research shows that working memory can contain a limited number of elements simultaneously; it is seen as short and finite, while long-term memory is seen as infinite (as cited in Friedenberg & Silverman, 2011). With that being said, knowledge should be moved to long-term memory because when learners are exposed to new materials, they can draw on this prior knowledge so that the cognitive load is reduced. Nonetheless, working memory failures are due to its overloading; learners are not capable to retreat on the long-term memory because of an incomplete knowledge (Sweller, 1988). This failure may include incomplete recall, failing to follow instructions, and task abandonment. However, if teachers understand how this theory can be applied in the classroom, they can plan their lessons in a way that takes into account cognitive load.

Sweller's theory was designed to supply strategies in order to assist the presentation of information in a manner that encourages learners' activities to optimize intellectual performance (Chandler & Sweller, 1991). It employs aspects of information processing

theory to emphasize the inherent limitations of concurrent working memory load on learning during instruction. John Sweller built a theory with a belief that learners' cognitive load increases because they have to process many factors at a time beside the actual knowledge they are trying to acquire. This makes it difficult for them to pay attention to necessary information and make learning unnecessarily difficult. Consequently, learning becomes less effective because learners are incapable to pay necessary devotion to learning and memorizing due to the increasing cognitive load (Chandler & Sweller, 1991).

According to F. Paas et al. (2003), theorists, exclusively, were able to produce a variety of new instructional designs and procedures. While the information that learners process varies on many dimensions, the extent to which significant elements interact is a critical feature. This means that the information differs on a range from low to high in element interactivity (F. Paas et al., 2003). Each element of low interactivity material can be learned individually without the consideration of any other elements because each item can be understood and learned with no reference to any other items. High interactivity material, like low-elements interactivity, can be learned individually; however, they cannot be understood until all of the elements are processed simultaneously (F. Paas et al., 2003). For example, *low interactivity* can be seen when learning a new language; learners can learn the meaning of each word one at a time. For *high interactivity*, driving a car is where a person needs to manage multiple interacting elements all at once until it all becomes mechanical. With all that being said, there is a certain amount of data that the person can hold onto, the more the information gets delivered at once, the less it is retained.

The CLT presents special ways in which teachers can design effective instructions that decrease the students' cognitive load. Additionally, it recommends diverse teaching techniques and it ensures the formation and retention of new memories. The theory suggests that learners can learn effectively and retain information for a long time if the learning conditions and their cognitive nature are in perfect alignment with each other (F. Paas et al., 2003). This means that an individual brain is capable of doing many things at a time. Sweller's theory proposes that instructors should design learning experiences to ensure the formation of new memory schemas by reducing the load on learners' working memory (Sweller, 1994). Since short-term memory is limited by doing so many things at a time, extra-pressure leadsto the augmentation of cognitive load. In addition, teachers have to be specific about what is being taught, the sequence of learning and the nature of the learning. Learners, on another hand, need to be clear about the particular thing that they

have learned (Sweller, 1988). Consequently, instructors have to consider this theory in order to lower the demands on the learner's processing capabilities so that building comprehension and bring about a more effective transfer of information into long-term memory.

1.2.9 History of Cognitive Load Theory

The history of Cognitive Load Theory can be traced to the beginning of Cognitive Science. In fact, during the Second World War, the military army was faced with the task of training huge numbers of soldiers. Skinner's theories were integrated into this training; among them the theory of stimulus-response. After the war, the successful military training design was replicated in business and in education. Benjamin Bloom's learning taxonomy was one learning theory that was the result of the military model training; the latter describes three types of learning; cognitive, psychomotor, and affective. During the 1960s, Piaget considered cognitive development in children. Learning theories were heavily influenced by digital computer growth in the 1970s. Constructivist theories dominated the 1980s and 1990s.

Dissimilar to these theories, the theory of Cognitive Load was developed by the English educational psychologist at the University of New South Wales John Sweller in the late 1970's during his work with students and problem-solving experiments (Sweller, 1988). Since then, the theory has received much attention and it has been refined and clarified by various researchers. John Sweller's Cognitive Load Theory models deal with how the brain processes and stores information, as well as how the brain can only handle a limited amount of new information at a time (Schnotz & Kürschner, 2007). *Psychologist researchers* also describes Cognitive Load Theory as the theory that seeks to recognize how the cognitive load created by learning tasks can impede students to process new information and to produce long-term memories (Schnotz & Kürschner, 2007; Sweller, 1994). Having said that, the cognitive load increases because individuals have to process a lot of aspects at once along with the actual knowledge they are trying to acquire. This makes it hard for them to pay attention to the necessary information and make learning difficult. Consequently, the learning becomes less effective because they are unable to pay the necessary devotion to learning and memorizing due to the increased cognitive load.

Though CLT did not appear until the late of the 20th century, it had its beginnings with the work of George Miller's paper of 1956, "The Magical Number Seven, Plus or Minus Two: Some Limits on Our Capacity for Processing Information". Miller (1956) was the first to propose that the working memory capacity has inherent limits. The experimental results of Miller suggested that humans are generally able to hold only seven plus or minus two units of information in their working memories (Miller, 1956). Chase and Simon, in 1973, were the first to use the term "chunk"; humans see chunks as patterns and relate them to other patterns, which form knowledge. This chunking of memory components has also been described as schema construction (Clark, Nguyen, & Sweller, 2011). Then in 1976, Sweller wrote: "the effect of task complexity and sequence on rule learning and problem-solving" (Sweller, 1988), to state that learners learn better when they perform worked examples than when they try to find the solutions to the problems all by themselves. This research is now widely used and it is based on a set of principles that are used to design more efficient instructions (Sweller, 1994).

In the late 1980s, while studying problem-solving, Sweller developed the cognitive load theory. He identified that learners often use a problem-solving strategy called means-ends analysis that requires a relatively great amount of cognitive processing ability which may not be devoted to schema construction (Sweller, 1988). Sweller suggests that instructional designers should reduce this additional cognitive load by designing instructional materials that do not involve problem-solving (Chandler & Sweller, 1991). Information may only be stored in long term memory after being processed by working memory (Schnotz & Kürschner, 2007); however, it is extremely limited in both capacity and duration; these limitations will hinder learning. In the 1990s, cognitive load theory was applied in several contexts. The empirical results from these studies led to the demonstration of several learning effects: the completion-problem effect; modality effect; split-attention effect; worked-example effect; and expertise reversal effect (Clark et al., 2011).

1.2.10 Types of Cognitive Load

Sweller's CLT provides wide implications for instructional design in which they control the conditions of learning within the instructional materials and environment (Chandler & Sweller, 1991). The theory provides empirical guidelines that assist

instructional designers to reduce the extraneous cognitive load during learning so as to change the learner's attention toward germane materials, hence increasing germane cognitive load. In fact, this theory differentiates between three main types of cognitive load and they all complement each other.

1.2.10.1 Intrinsic Cognitive Load

The information that learners ought to process varies on a range from low to high-element interactivity. Without consideration of any other elements, each element of low-element interactivity material can be understood and learnt individually (Sweller, 1994). That is to say, each item can be understood and learnt without reference to any other items. Quite the reverse, high-element interactivity material can be learnt individually, but after all the interactions have been processed simultaneously. Element interactivity leads to the initial category of cognitive load which is intrinsic cognitive load.

Originally, the term was used in the early 1990s by Chandler and Sweller. Intrinsic cognitive load represents the inherent difficulty involved in particular activities or materials. A number of tasks are harder to gain mastery over than others (Chandler & Sweller, 1991). As a matter of fact, if the activities are complex, they can cause an intrinsic cognitive load. This type is related to the subject matter of the activity or the problem itself that the learner finds difficult and challenging; the number of elements interacting with each other that must be processed simultaneously make the task more complicated. Since learners need to attend a large number of elements at once, the intrinsic load would be higher than in the case of low number of elements. Given the fact that working memory is limited, long-term memory is not; the more elements the learner holds in long-term memory schemas, the easier the learning activity will be, because when dealing with new information, working memory will be limited (F. Paas et al., 2003). Subsequently, an activity will have an intrinsic load affected by the complexity of the activity, the expertise, and the working memory capacity of the learner.

John Sweller highlights that this particular load depends upon two factors: the ability to comprehend new information along side with the difficulty of that information being presented. This type of load is extremely difficult to be avoided or eliminated due to its complex nature. Evidently, it is hard and challenging to achieve a difficult task than solving a simple problem. Yet, that complexity cannot be changed, but it can be handled

according to the learner's prior knowledge concerning the material, aptitude, and the capacity for learning (Sweller, 1994).

Cognitive load theorists such as Paas Fred, Renkel and John Sweller, in 2002, realized that there must to be ways of reducing intrinsic cognitive load; otherwise difficult materials could never be learnt. They adapted the theory so as to argue that intrinsic cognitive load can be reduced, but it is impossible to simultaneously maintain a full understanding (F. Paas et al., 2003). According to John Sweller, the intrinsic cognitive load can "only be altered by changing the nature of what is learned or by the act of learning itself" (Sweller, 2010). This means that the inherent difficulty may not be changed by an instructor. Nonetheless, some schemas may be broken into individual sub-schemas and taught in separation to be afterward brought back together and described as a united whole; the small bit that has been learnt by the reduction can be integrated with other small bits learnt that will consequently enhance learning.

1.2.10.2 Extraneous Cognitive Load

Extraneous or ineffective cognitive load is the form of load produced when learners have to meet additional requirements and demands of teachers. According to Sweller (1988), it is the extra load that is imposed by inadequately designed instructional material; it is the set of needless details that affect the individuals' cognitive capacity. This sort of load represents anything included but does not directly contribute to learning goals (Clark et al., 2011). It is the product of extraneous and irrelevant pieces of information given to learners. For instance, in an online article, one may find several advertisements and pictures that do not serve the actual purpose and are integrated only to make the article more attractive. These are the unnecessary pieces of information that interfere the learning process and cause an extraneous load.

Besides, the load can be the outcome of ineffective and unproductive methods of teaching which mislead the learner and make learning needlessly confusing and complicated (Schnotz & Kürschner, 2007). As the name implies, it is the extra load that does not help learning. Extraneous load, moreover, can be the outcome that arrives with background noise (Clark et al., 2011); for example, when someone is trying to study and he or she is disturbed by the cars honking, loud music or talking. These different noises act as obstacles to the achievement of the activity and are deemed as ineffective load. Thus, the

concept being studied becomes more complex and difficult to grasp. Similarly, the distracting information often unintentionally misdirects learners and sets them off on the wrong path.

Chandler and Sweller (1991) believe that numerous conventional instructional procedures enforce irrelevant cognitive load because those instructional procedures were not developed with any consideration or knowledge to the structure of information and the cognitive construction. For instance, in an explanation, those instructional procedures that require learners to engage in a search for a problem solution are expected to impose a serious extraneous cognitive load because working memory resources have been used for activities that are irrelevant to schema acquisition and automation.

Since this category of cognitive load is produced by the manner in which information is presented to learners and is under the control of instructional designers, it can be attributed to the design of the instructional materials. Cognitive load theorists proposed that differences in performance were owing to higher levels of the cognitive load imposed by the format of instruction (Chandler & Sweller, 1991). This means that high intrinsic cognitive load requires materials designed so as to reduce the extraneous load.

Initially, the theory was concerned with extraneous cognitive load that was under the control of instructional designers. Sweller (1994) thought that designers can reduce the load by employing more effective teaching methods and techniques. Extraneous cognitive load is primarily important when intrinsic cognitive load is high because the two types of cognitive load are additive. That is to say, if intrinsic cognitive load is low, levels of extraneous cognitive load may be less important because total cognitive load may not exceed working memory ability. As a result, instructional designers intended to decrease cognitive load when element interactivity is high. However, when element interactivity is low, decreasing the load on working memory has little or no effect (Clark et al., 2011). On another hand, cognitive load theorists stated that it is not always essential to reduce the extraneous cognitive load to aid learning, there is evidence that moderate extraneous load in some cases can serve learners (Schnotz & Kürschner, 2007).

1.2.10.3 Germane Cognitive Load

Unlike the first two forms of cognitive load, according to Sweller, germane or effective cognitive load is the mental capacity that is directed towards incorporating the new information with the existing knowledge. This form of load is the outcome of the constructive method of handling information, in a way that aids learning (Clark et al., 2011). In other words, germane cognitive load refers to the work that is put into constructing a long-lasting store of knowledge or schema; i.e. the processing, construction and automation of schemas. Germane cognitive load involves developing patterns of thoughts and behaviors to organize categories of information; the more practiced the use of these behavioral schemas becomes, the more effortless the behavior becomes.

Germane cognitive load was discovered after the cognitive load theory. In 1994, Dutch researchers such as Fred Paas and Jeroen van Merrienboer found that work examples which differ considerably in variability, will increase learners' cognitive load compared to work examples that are alike. They labeled this form of cognitive load germane cognitive load because it was a useful load to schema acquisition and automation (F. Paas et al., 2003). Sweller (1994), said that like extraneous cognitive load and unlike intrinsic cognitive load, germane cognitive load is affected by instructional designers. The manner in which information is presented to learners and the learning tasks required from learners are features relevant to levels of germane cognitive load. While extraneous cognitive load interferes with learning, germane cognitive load improves learning.

Until the 1998, in an article by Sweller, Van Merriënboer and Paas, there was a concentrating put on the reduction of extraneous cognitive load and promotion of germane load. These researchers looked for ways of redesigning instructions to redirect what would be irrelevant load and focused toward schema construction; germane load. Accordingly, F. Paas et al. (2003) asserted that instructional designers need to decrease extraneous cognitive load and redirect learners' attention to cognitive processes that are directly significant to the building of schemas. The purpose, therefore, of reducing extraneous cognitive load is to free working memory capacity for germane load; learning will not progress if the reduction of extraneous load is done just to reduce mental work. Germane cognitive load can be improved through the use of mnemonics; i.e. memory aids which are tools that help in remembering an idea with a pattern of letters, numbers, or relatable associations. It may include acrostics; a piece of writing in which a particular set of letters

(the first letter of each line, word, or paragraph) spells out a word or phrase with special significance to the text, or rhyme schemes; the pattern according to which end rhymes (rhymes located at the end of lines) are repeated in works poetry. Using these techniques learning would be uncomplicated and effortless (Clark et al., 2011). Since the brain has specialized tools to handle information in the sense that the cognitive load indicates the power needed to do the task, this significantly will accelerate the process of learning.

1.2.11 The Way Cognitive Load Works

When working memory is overloaded, the learning process can be slowed down, confusion caused and frustration is created (Levy, 1994). This is why older people find learning something new frustrating due to cognitive overload. Aging is one of the many factors that are known to decrease the efficiency of working memory, and if variables are imposed upon a person who has no frame of reference to aid with germane load, results are likely to be a cognitive overload. Likewise, children are vulnerable to cognitive overload because they have very little information stored in their long-term memory to provide new information with a frame of reference (Friedenberg & Silverman, 2011). Sweller and his colleagues highlighted that intrinsic cognitive load is not something a teacher can control, but extraneous load should be minimized to free up working memory (F. Paas et al., 2003). In contrast, instructional techniques that aid germane cognitive load should be maximized in order to free up working memory so as to facilitate germane load; these techniques may include the use of short preparatory explanations, reinforcing new information, verbal and visual and chunking content into segments (Clark et al., 2011).

Cognitive load, depending on its sort, can either be unfavorable or useful in learning. So, effective learning process involves managing intrinsic cognitive load, optimizing cognitive extraneous load and promote germane cognitive load (Clark et al., 2011). First, extraneous load needs to be reduced or increased based on a number of factors; attentional demands for an activity, if the learner has attentional difficulties, type of the activity, etc. Second, intrinsic cognitive load is difficult to understand in the real world. Through simplifying the content it might be clear, but it may also obstruct memory. Last but not least, germane cognitive load should be further optimized by using efficient

study methods; pure number of an increased germane load may not help. However, increased germane cognitive load with a proper strategy will help.

Intrinsic, extraneous, and germane cognitive loads are additive in which the overall load cannot go beyond the working memory resources accessible if learning is to occur. Sweller's theory suggest that the relations between the three types of cognitive load are asymmetric. Intrinsic cognitive load supplies a base load that is irreducible other than by constructing extra schemas and automating previously acquired schemas. After the resources have been allocated to deal with intrinsic cognitive load, any remaining working memory capacity is allocated to deal with both extraneous and germane cognitive loads.

1.2.12 Measuring Cognitive Load

The measurement of cognitive load is usually regarded as a complex task, even a few researchers argue against the use of distinct measures for the different load types. In the 1980s, in order to clarify experimental outcomes, the cognitive load was used as a theoretical construct; however, very little effort was made to measure the load directly (Sweller, 2018). This means that the construct was assumed rather than measured. The theory was used to predict differential learning using particular instructional designs. Besides, it had not been identified the difference between extraneous and intrinsic cognitive load but the consequences were owing to extraneous cognitive load. At that time, according to Sweller (1988), the only distinct indicator of the cognitive load was the use of computational models with quantitative variations between models used as cognitive load alternatives.

There are two different techniques to measure cognitive load. The one that subjectively measures the load in which it expects the learner to analyze the cognitive process and assess the cognitive load and the other is the direct measurement of cognitive load in which the learner unconsciously reacts to the cognitive load (Smith, 2008). As cited in Smith (2008), Brünken, Plass, and Leutner (2003) point out that there are two main ways to measure cognitive load. First, the objective/subjective measurement that refers to the methods for data collection. Second, the direct/indirect measurement that refers to the causal relationship between the method and the participants.

In his article "*Measuring Cognitive Load*", Sweller (2018) indicates that in the early 1990s Fred Paas introduced the initial rating scale measure of cognitive load. Mainly, the rating scale is used to measure extraneous cognitive load and it has shown that instructional designs assumed to reduce cognitive load as measured by the scale alongside increasing performance test scores. The categories of cognitive load are not distinguished by the rating scale of Paas. Sweller wants to say that "when intrinsic load was introduced, the scale could just as easily be used to successfully measure intrinsic load" (Sweller, 2018, p. 1). When a simple and low element interactivity information is used, intrinsic cognitive load would be occurred as long as the extraneous cognitive load was not introduced.

The Dual-Task, for instance, is one method to measure cognitive load; it has various benefits. To start with, the dual-task is that both primary and secondary tasks are presented simultaneously. This means that the load is measured at the exact time that it is intended to the learner, while other subjective measures can be applied after learning only. Next, studies on working memory have proven that there are various secondary tasks linked to various process steps of information processing. These different tasks pinpoint the way of the process steps the cognitive load is imposed (Baddeley, 1986) as cited by (Smith, 2008). Since the dual-task analysis is carried out within precise subject designs; these variant instructions provoke the measurement of cognitive load and make the measurement separate from individual differences that will influence learning results. As cited in (Smith, 2008), Lansman & Hunt,1982 on measuring cognitive load, demonstrate that the challenges of the dual-task method lie in the methodological and technical issues that have to be taken into consideration.

There are alternatives to the Paas scale. Secondary tasks, for example, are one of the most common alternatives; it involves learners to engage in a different task that is secondary to the primary one (Sweller, 2018). Sweller added that the reduced performance on the secondary task indicates that the initial task compels an increased working memory load. Moreover, developing psychometric scales should differentiate between extraneous and intrinsic cognitive load but it is not always the case. Paas et al. (1994), as cited in Smith (2008), declared that the secondary task involves the same cognitive resources as the primary tasks so that its performance will be independent from the primary task

performance. Paas (1994) added that the measure needs to be reliable, valid and so simple to not hold back simultaneous learning processes.

Fred GWC Paas and Van Merriënboer (1993) developed a construct called "relative condition efficiency"; this concept is used to measure perceived mental efforts; it provides relatively simple means of comparing instructional conditions. Furthermore, it joins mental effort ratings with performance scores. Paas and Van Merriënboer exploited the construct to compare the different instructional conditions; worked examples, completion problems, and discovery practice. They concluded that learners who studied worked examples were efficient more than those who used the problem completion strategy (Fred GWC Paas & Van Merriënboer, 1993).

There are many several methods of measuring the cognitive load of users, ranging from direct measurement of neurophysiological response to post-event questions (Tracy & Albers, 2006). Tracy and Albert said that there are many techniques to measure the physical responses which are accurate but they are also expensive and need special equipment and training. An alternative to these expensive methods of cognitive load measurement is the use of subjective scales. F. Paas et al. (2003) maintained that the subjective scale is easily applied within a simple usability test. In 1992, Paas asked participants for an indication of their mental effort during a learning task. Skulmowski and Rey (2017) affirmed that the mental effort item developed by Paas (1992) was used in various examinations to compute the instructional efficiency of learning.

Another method of cognitive load measurement is the NASA Task Load Index (NASA-TLX) that is survey-based, which has been recently used in studies concerning embodied learning and problem-solving (Skulmowski & Rey, 2017). Tracy and Albers (2006) assert that, while completing several tasks, the NASA-TLX test evaluates the workload experienced during an established six rating scales; mental demand, physical demand, temporal demand, performance, effort, frustration. They added that the concept of the NASA-TLX does not test the users while they are in the process of completing the task. Recently, the available cognitive load surveys include items aimed to measure the three distinct load types; intrinsic, extraneous, and germane (Skulmowski & Rey, 2017). This type of test forces the user to rely on what he or she remembers and provides an opinion based on memory. Yet, the test items of this instrument refer to instructions, explanations,

concepts, and definitions. This survey is suitable for instructional settings that rely strongly on verbal instructions.

Sternberg Memory Test initially intended to measure the speed for searching and retrieving information from short-term memory. Sternberg (1966) claims that numerous theories of short-term memory can be verified by changing the number of items on the list. Sternberg's test is simple; nevertheless, the speed of reactions varies with the cognitive load. A user responds slower for high load circumstances. Consequently, the overload will cause a major delay or forgetting of what was memorized (Sternberg, 1966). NASA-TLX according to Stenberg (1966) is a post-event test that captures the way people memorize the interaction; however, the Sternberg Memory task supplies the capacity to collect the users' responses throughout the interaction. Behavioral and physiological measures of cognitive load also are alternatives to subjective measures. For that reason, researchers have an extensive variety of tools for cognitive load measurement at their disposal. Nonetheless, some techniques are more suitable than others for particular situations.

1.2.13 Reducing the Cognitive Load

Cognitive overload is about receiving a lot of information at once. For some people, the outcome is frustration, anger or confusion. Nonetheless, for others with neurological problems or cognitive disabilities this can cause neurological events such as seizures, tremors, and loss of consciousness. The crucial point, here, is to avoid causing overload with overwhelming designs and large quantities of input because every action the user takes adds to their cognitive load. Reducing the load is not about making the content simple, but challenging learners without overloading their working memory (Richard E. Mayer, 2005). Designers are responsible for creating experiences that deliver the content in a way that is accessible, engaging and efficient.

Teachers can do several things to decrease the extraneous load and support the construction of germane load. Two questions need to be answered before materials presentation: what is the best way of presenting the information, and what is the best way of reducing the extraneous load? Teachers should use the best methods of presentation. Also, they need to consider the design of the classroom as it can influence students' psychology as well as keeping other features of the classroom environment in mind when working with the cognitive load theory. Rearranging classroom settings, for example, offer

a collaborative learning environment. However, classroom distractions can lead to the development of extraneous load. Technology has changed the way learners used to learn. Yet, technological distractions must be avoided. Group work also entails various distractions; learners will have to understand group dynamics. Hence, the extraneous load uses some of the working memory that is involved to produce intrinsic and germane loads. The major objective of the theory is to minimize the extraneous load by creating a learning environment that does not set extra pressure on working memory (Clark et al., 2011).

Learners have to transfer information from *working memory* to *long-term memory* so that the information should be presented in a way that it decreases the irrelevant load and promotes germane load. Richard E Mayer and Moreno (2003) conducted a research that aimed at reducing *cognitive load in multimedia learning*. The research study was built on the theory of cognitive load and stands on three assumptions: firstly, humans have separate information processing channels (Dual Channel). Secondly, there is a limited amount of processing capacity accessible (Limited Capacity). Lastly, learning requires significant cognitive processing (Active Processing).

For the design of multimedia learning environments, three aims were developed. First, extraneous cognitive processing; the most common problem to multimedia learning, should be reduced. In this case, the learner engages in an extraneous cognitive processing that is not pertinent to learning the essential material. Since the amount of cognitive capacity is limited, learners may not have sufficient remaining capacity for essential and generative processing because they were engaged in large amounts of extraneous processing. Second, it is necessary to help learners to handle essential processing so that it does not overload their cognitive system. Cognitive capacity can be used for essential processing that is mentally organizing the essential material and integrating it with prior knowledge. In some cases, nevertheless, the needs of essential processing may exceed the learners' cognitive capacity in which the materials are complex, unfamiliar, or presented at a fast pace resulting in essential overload. Finally, the learner has an available capacity to engage in generative processing after eliminating extraneous processing and manages essential processing (Richard E Mayer & Moreno, 2010).

Richard E. Mayer and Roxana Moreno (2010) provided a set of techniques to reduce the extraneous cognitive load and to manage the intrinsic cognitive load during multimedia learning. The first technique that reduces cognitive overload is the modality

principle. In some situations, unfamiliar and hard materials are presented at a rapid pace. In this case, one channel is overloaded with essential processing demands creating what Sweller (1994) called "split-attention effect" because learners' visual attention is divided between different information. Mousavi, Low, and Sweller (1995) argue that if all of the information are processed visually, the visual channel overloads. The eyes get too much simultaneous information, but few of this information can be processed in the visual working memory. However, using narration transfers some of the information to the verbal channel thereby spreading the load between the channels and improving processing capacity. The processing demands on the visual channel are thereby reduced, so learners are better able to pick important features of animation for additional processing (Richard E Mayer & Moreno, 2003). In this way, the words are processed in the verbal channel, whereas the animation is processed in the visual channel. "The modality principle may help in managing essential processing by distributing the cognitive processing across both information-processing channels" (Richard E Mayer & Moreno, 2010, p. 147).

Segmenting Principle is the next way to reduce cognitive overload. Both channels (visual and verbal) are overloaded with essential processing demands such as rich content, fast pace of presentation, and small prior knowledge that help learners organize the following content. Thus, learners may not have sufficient time to engage in deeper processes (Richard E. Mayer, 2005). By the time learners select relevant words and pictures from one segment of the content, the next segment begins, thereby cutting short the time needed for deeper processing. This situation leads to cognitive overload in which available cognitive capacity is not sufficient to meet the required processing demands. Sweller referred to this as a high-intrinsic load (Sweller, 1988). Segmenting is a possible solution to help learners understand so that the complex subject content is broken down into smaller, bite-sized and manageable chunks that are under the learners' control and devoted to memory (Richard E Mayer & Moreno, 2003). In this way, learners can mentally represent one segment of the system before moving on to the next and control the pace of learning to process the information more efficiently. Richard E Mayer and Moreno (2010) thought that learners are able to select words and images from the segment because they have time and capacity to organize and integrate the selected words and images. Subsequently, learners are ready for the next segment.

While segmenting seems to be a promising method to reduce cognitive overload, sometimes it might not be possible. Richard E Mayer and Moreno (2010) provided pre-training as an alternative technique for managing intrinsic cognitive load that assists learners to acquire prerequisite knowledge that will help them process the narrated animation. The pre-training principle allows learners to receive prior instruction concerning the components of the content. Thus, learners can process effectively a narrated animation. Richard E Mayer and Moreno (2003) declared that pre-training intends to provide pertinent knowledge in long-term memory; including the name, location, and behavior of the component before presenting a narrated animation that is difficult, fast-paced, or unfamiliar so learners need to assign less processing to the new incoming materials.

Sometimes learners seek to engage in both essential and incidental processing, which together exceed the learners' available cognitive capacity. However, adding interesting but irrelevant materials make learners use limited cognitive resources on incidental processing, leaving fewer cognitive capacity for essential processing. Accordingly, learners will be less likely to engage in the cognitive processes required for significant learning (F. Paas et al., 2003). To resolve this difficulty, designers should eliminate and delete extraneous materials from multimedia instructions (Richard E. Mayer, 2005). E-Learning aims at instructing the audience not amuse them. A screen full of icons, images, ads, background music, and decorative graphics may appear to make learning motivating but it disorder learners, it distracts them from what they are trying to learn and consumes their mental resources. Richard E Mayer and Moreno (2003) state that if the content does not support the instructional goals, it should be removed. According to them, making the narrated animation as concise and coherent as possible, learners will not be primed to engage in incidental processing but in essential processing. Cognitive processing capacity is limited and must be assigned to extraneous, essential, and generative processing. When extraneous materials are excluded, learners engage in less extraneous processing. This leaves more capacity for essential and generative processing and thus is more likely to lead to successful learning outcomes, this Mayer and Moreno called Coherence Principle (Richard E Mayer & Moreno, 2010).

Sometimes it is not feasible to delete and remove all the embellishments in multimedia content, Richard E Mayer and Moreno (2003) said that cognitive load can be

reduced by providing cues to the learner about how to choose and manage materials. For instance, through incorporating signals in the narration, such as outlines, highlights, headings, and pointer words that can help direct learners' attention toward the essential material, thus decreasing extraneous processing. This means that a signaled version guided learners' cognitive processes of selecting words by stressing key them in speech, selecting images by adding red and blue arrows to the animation, organizing words by adding an outline and headings, and organizing images by adding a map. Richard E Mayer and Moreno (2010) assert "Signaling principle leaves more capacity for essential and generative processing, and thus is more likely to lead to meaningful learning outcomes" (Richard E Mayer & Moreno, 2010, p. 140).

An additional instance of extraneous processing caused by inconsiderate design is that the essential materials are presented in a confusing way. Richard E. Mayer (2005), creating incidental cognitive load is to misalign words and pictures on the screen. That is to say that when learners receive separated information they must scan the screen to find which part of the graphic corresponds to the words. In this case, which called a separated presentation, learners have to engage in a great deal of scanning to figure out which part of the animation corresponds with the words, creating what is called incidental processing (Richard E Mayer & Moreno, 2003). This form of extraneous processing can be eliminated when the words are placed next to the part of the graphic they describe. Spatial principle or integrated presentation, according to Mayer and Moreno, **is** about placing the text close to the corresponding graphic which improves the transfer of information and allows the learner to devote more cognitive capacity to essential processing (Richard E Mayer & Moreno, 2010).

Redundancy is when a multimedia presentation consists of concurrent animation, narration, and on-screen text. In this case, which called redundant presentation an extraneous processing is created, because learners may attempt to settle the two incoming verbal streams and may have to scan the animation to find elements corresponding towards at the bottom of the screen. This is partially because it becomes more challenging to pay attention to repeated information, but also because the learner is looking for a minor distinction that might clarify the obvious repetition. Thus, priming incidental processing that reduces the capacity to engage in essential processing (Richard E Mayer & Moreno, 2003). Mousavi et al. (1995) state that eliminating redundancy is a practical technique to

reduce cognitive load; students understand a multimedia presentation better when words are presented as narration rather than as narration and on-screen text. That is to say that when the redundant on-screen text is removed, learners engage in less extraneous processing, freeing up cognitive capacity to be used for essential and generative processing. Nevertheless, Richard E Mayer and Moreno (2010) argue that there may be circumstances in which redundant on-screen text makes pedagogic sense, such as when learners are non-native speakers or when the words are technical terms or difficult to utter.

Sometimes the extraneous processing is caused by inconsiderate content of the instructional materials because learners must use plenty of cognitive capacity to grasp the whole narration in working memory until the animation is presented or vice versa. Richard E Mayer and Moreno (2003) provide a solution to this problem, they said that through synchronizing the presentation of corresponding visual and auditory material, learners will be able to mentally incorporate the verbal and pictorial material within each segment, thereby eliminating the need to hold the material in working memory over a long time. The extra cognitive capacity used to hold the representation in working memory can add to cognitive overload, it is referred to as temporal contiguity effect in which learners understand a multimedia presentation better when animation and narration are presented simultaneously rather than successively (Richard E Mayer & Moreno, 2010).

In conclusion, cognitive load is one of those things that never appear on a workflow chart and is rarely discussed in design meetings but it should be at the center of everything designed. Instructional designers need to be aware of the cognitive requirements their designs compel and ensure that learners can meet those necessities. They must also ensure that all aspects of the design focus on adding value to the learning experience. Being aware of cognitive load and how to reduce it will minimize the amount of effort it takes to design. Nevertheless, if the cognitive load is reduced too much, the total learning process would consist of too many small steps and would thus become excessively fragmented and long.

1.3 Section Two: Video-Based Learning

1.3.1 Technology in Language Teaching and Learning

Before the emergence of digital technology, education has developed over the centuries into a framework that uses paper-based materials in a number of complex ways to accomplish the task of creating and adopting knowledge and skills. Its future must therefore depend on extending the capacity for advanced use of digital technologies. According to Isman (2012), technology is the practical utilization of knowledge in a particular area. In other words, it is a manner of doing activities using technical processes, methods, and knowledge. In addition to hardware, like instruments and tools, technology use also includes organized relationships with other humans, machines, and the environment (Isman, 2012). Presently, education is all about how to learn and adapt to the potentials that information and communication technologies (ICTs) offer. Around the year 1992, the term ICTs was introduced. According to UNESCO (2002), ICT is the combination of "Informatics technology" and "communication technology". Being available to the general public, the e-mail has helped in the spreading of ICTs (Pelgrum & Law, 2003). Another set of available ICTs products, like teleconferencing, audio conferencing, television lessons, radio broadcasts, interactive radio counseling, and CD ROMs, have been used in education for various purposes (Sharma, 2003).

Leadbeater (2009) claimed that ICTs have become an essential component of modern society within a short period of time. He added, in addition to literacy and numeracy, basic skills and principles of ICTs should be learned as a part of the center of education (Leadbeater, 2009). Thus, technology has been integrated into the curriculum with the aim of facilitating the process of teaching and learning. Gilakjani (2017), describes technology integration in terms of the way educators effectively use technology to perform and reconfigure tasks. Along the same lines, Susikaran (2013) argues that technology integration is the use of technology to improve the educational environment. Through technology incorporation, teaching is supported by providing opportunities for learners to complete activities and assignments. Hence, technology has becomes a vital component of the learning process and a major concern for instructors as language teaching methods have changed due to the technology that teachers can use to improve learners' learning (Eady & Lockyer, 2013).

As mentioned earlier, ICTs, which are undeniable in teaching, learning, and research, have influenced the field of education (Yusuf, 2005). Therefore, the twenty-first century has reinvented the art of teaching. Technology now has the power to create, accelerate, enrich and deepen skills, motivate and engage learners, help link school experience with work practices, build economic practicality for workers of tomorrow, as well as strengthening teaching (Yusuf, 2005). From papyrus and paper, chalk and print to overhead projectors, educational toys, and television, even the basic writing technologies, all these were innovations in the past (Arifah, 2014). On another hand, computers have not been fully integrated into learning the conventional subject, because there has an assumption that education systems will need to prepare citizens for lifelong learning in an information society which has led to an increased interest in ICTs (Pelgrum & Law, 2003). Educators and learners used technology at that time to barely obtain data because there was only Web 1.0 which allowed users to access the data (Patel, 2013). Nonetheless, technological advancements have continued to evolve from time to time, leading to use improvements in the field of education. As a result, the 1990s were the decade of computer communications and information access, mainly with the prevalence and accessibility of internet-based services such as electronic mail and the World Wide Web (WWW). According to Becker (2000), since computers are considered as an essential educational tool in language teaching and learning, teachers have convenient access and some freedom in the curriculum to be adequately prepared. Furthermore, Ahmadi and Reza (2018) both indicated that computer-based tasks afford fast data and suitable materials for learners. The creation of information is being democratized - the process by which access to technology rapidly continues to become more accessible to more people - through personal websites, blogs, podcasts, and wikis. Moreover, social software - including communication and interactive tools often based on the internet - enables involvement in online communities that identify and share the data they need for themselves. Like previous innovations, the latest results of human initiatives, digital networked computer, mobile, and wireless devices can be integrated into educational practices without changing the primary goal of learning. Hence, it is gradually integrated with the global computer network to provide data services with seamless, location-independent access (Zemin, 2009).

Technology also has a profound effect on educational institutions. Networking between colleges and universities takes place within an educational framework that transcends the traditional institutional and even sectoral divisions. One of the unique

improvements can be seen through the introduction of blended learning (Yapici & Akbayin, 2012). The latter is the approach that combines online educational materials and opportunities for interaction online with traditional place-based classroom methods. According to Graham (2006), blended learning systems are a mixture of traditional face-to-face learning and online learning using computer instructions that learners do not have to attend class. (Ovilia & Asfina, 2017). With that being said, students are increasingly likely to take what they learn from one place to another, in the form of e-portfolios, and make decisions about how, when, and, where they engage in education. They can use a public website to find out about courses, contact instructors, access resources through an information portal or virtual learning environment (VLE), and take exams via a computer-based assessment system (Beetham & Sharpe, 2007). Ultimately, teachers have to rely on the use of technology to enhance students learning as a reason to invest (Noor-Ul-Amin, 2013).

Currently, several developments have taken place in the field of education regarding the growth of the new generation of learners in the digital world. Leadbeater (2009) argue that today's students are no longer seen as passive bystanders and recipients of knowledge and skills, but are seen as active participants in the learning process. They also see themselves as participants who create information and generate new ideas. Dawson, Cavanaugh, and Ritzhaupt (2008) maintain that the use of technology can create a student-centered learning atmosphere rather than the teacher who in turn provides positive opportunities. Furthermore, technology enables learners to learn independently and to acquire responsible behaviors as they are self-directed through the autonomous use of technology (Gilakjani, 2017).

According to McLoughlin and Lee (2008), teaching in the twenty-first century is based on three pedagogical principles. *Personalization* is the first principle, it means tailoring an activity to accommodate specific individuals. *Engagement* is the next principle; in which the activity will engage individuals. *Productivity* is the last principle; it allows individuals to produce and create. This implies that the framework permits learners to learn through authentic real contexts, carrying out tasks from start to finish, and solving problems as they occur, all of which are effective learning strategies (Luna Scott, 2015). Going specific, teaching English as a foreign/second language (TEFL/ TESL), Susikaran (2013) contends that chalk and talk teaching method is no longer sufficient to teach

English effectively in this evolving world, thus fundamental changes in teaching methods have occurred. Patel (2013) adds about technology implementation, that technology has significantly changed English language teaching (ELT) methods. That this to say, technology offers several alternatives as making teaching interesting and productive in terms of advancement. Arifah (2014) has described a range of advancements in English language teaching. For instance, vocabulary and language structures can be boosted through the application of multimedia texts. In simple words, multimedia can make use of print texts, videos, and the internet to increase the linguistic knowledge of learners. In addition to this, multimedia usage will give learners the opportunity to gather information, analyze, and interpret language and contexts through various materials (Arifah, 2014). As a matter of fact, learners can develop higher-order thinking skills when learning with technology. It can also be inferred that an effective mix of multimedia and teaching methodology is crucial to attracting the attention of learners towards English language learning.

1.3.2 The Importance of Technology in Language Teaching and Learning

Many studies on educational technology report that technology has a positive effect on both learners and teachers in the sense that it promotes the development of teaching methods along with students' knowledge (Timuçin, 2006). In other words, learners learn more effectively by using technological tools rather than the traditional teaching method, as it provides them with new alternatives that make teaching more efficient in terms of progress. According to Rosenthal (2013), educators can incorporate technology in the classroom from two different perspectives. First, from the cognitive approach, learners can get the opportunity to meaningfully increase their exposure to the language and build their own knowledge. Secondly, from the social approach, learners are given various opportunities for real social interactions and real-life practices. With that being said, the positive aspect of technology integration often encourages English as a foreign language (EFL) educators to apply its benefits in enhancing educational practices for English teaching. Several studies have documented the importance of technology for language learning.

Technology facilitates learners' learning and acts as a true educational mean that allows learning to take place. It seems to develop the academic ability of language learners. Baytak, Tarman, and Ayas (2011) conducted a research on the effects of technology on language learning. Their findings revealed that integrating technology into classes improved learners' learning. This improvement is most likely to be achieved, according to Lee (2000), through changing students' learning attitudes and enhancing their self-confidence. Besides, technology use boosts language proficiency of learners and their overall academic skills (Galavis, 1998).

One of the benefits of using technology is that it boosts learners' motivation, engagement, and social interactions. Genc Ilter (2009) indicated that technology use has a vital role in motivating educators and students alike to function in innovative ways. Along the same lines, Godzicki, Godzicki, Krofel, and Michaels (2013) conducted a research on the motivation and engagement of learners in the classroom. The results obtained revealed that when technology is used as an educational tool, learners are more likely to engage in classroom activities. Technology use has shown an improvement when it comes to students' motivation who mentioned that it makes learning more enjoyable, interesting, interactive, and helps them learn more (Godzicki et al., 2013).

In learning practices, the use of technology encourages collaboration and communication (Nevgi, Virtanen, & Niemi, 2006). Technology use improves learners' collaboration in learning activities (Al-Rahmi & Zeki, 2017). This goal can be achieved through the cooperation of learners in real tasks. It helps them to collect information and interact with resources like images and videos. In the same line of thought, Murphy, Schegg, and Olaru (2006) state that internet can not only serve as a source of reference but also as a tool of communication. For instance, technology enables students to get connected to the world outside the classroom, thus, create great work that will be sought by a large audience.

According to Bull and Ma (2001), technology provides language learners with unlimited materials and appropriate resources. Larsen-Freeman and Anderson (2011) supported the view that technology offers teaching opportunities and brings learning experience to the learners' world. Through the use of technology, learners can be provided with various authentic materials and can be motivated in language learning. Jeremy Harmer (2007) emphasizes that in order to achieve success in language learning, teachers

should encourage learners to find suitable activities through using technology. Gilakjani (2017) asserts that technology allows learners to gain access to a lot of information that their teachers cannot provide and control. The use of multimedia in the classroom, for example, makes use of print texts, video, and internet to develop the linguistic knowledge of learners. It also offers learners, according to Arifah (2014), an opportunity to gather information and provides them with various recourses to analyze and interpret language and contexts. Consequently, the true combination of multimedia and teaching methodology is necessary to attract learners' attention towards English language learning.

The use of technology has converted the existing language teaching methods (Solanki & Phil, 2012). Gilakjani (2017) agrees with the perspective that the method of teaching language has changed due to technology. This transition has accelerated a shift from teacher-centered to learner-centered approaches in language learning and teaching. Gilakjani (2017) argues that the use of technology could produce an educational environment centered on the student rather than the educator which in turn leads to constructive change. Digital learners' needs can be met through the adoption of new teachers' roles. They need to be facilitators, rather than spoon-feed learners, and should guide learners to increase their learning (Riasati, Allahyar, & Tan, 2012). According to Susikaran (2013), besides teaching methods, fundamental improvements have taken place in the classroom, since the teaching method of chalk and talk is not sufficient to efficiently teach English. For instance, the use of computer technology improves teachers' teaching and learners' learning (Bennett, McMillan-Culp, Honey, Tally, & Spielvogel, 2000). They Bennett et al. (2000) highlighted that using computer technology has created an active language class filled with meaningful tasks where students are responsible for their learning. Because as learners become more independent, teachers feel that they must motivate and encourage them to act and think autonomously.

The appropriate use of technology can bring a lot of benefits to both educators and students. In this regard, technology plays a significant role in improving learners' creativity and providing them with interesting, motivating, enjoyable, and exciting alternatives to learn a foreign language effectively. Students, on the one hand, can use technology to solve related learning problems and find methods to use what they have learned in effective and meaningful ways. On the other hand, technology offers interaction between teachers and

learners, provides comprehensible input and output, helps learners improve thinking skills, leads to student-centered classroom, and develops learners' autonomy.

1.3.3 Teachers' Attitudes towards Technology

The successful implementation of instructional technologies relies mainly on the attitudes of instructors, who ultimately determine how to implement them in the classroom. Teachers' attitudes serve as a key predictor of technology use in the educational environment (Tezci, 2009). According to Albirini (2006); (Samak & Tawfik, 2006), attitudes are believed to consist of three components: the affective component indicates the emotional state of a person about an attitudinal object; the cognitive component is related to the knowledge of the person about an attitudinal object; and the behavioral component representing the evident actions towards an attitudinal object. All of these components should be taken into consideration in order to obtain an accurate understanding of one's attitude. Nonetheless, understanding the attitudes of teachers have not always been a simple task depending on the fact that different factors can affect one's attitude.

According to Rogers' idea (1995), the shift from knowledge about technology to the formation of attitudes toward it and then to its implementation or rejection supports the general and widely accepted belief that attitudes affect behavior directly or indirectly (Orr, 2003). In this regard, teachers' attitudes serve the main role in incorporating new technologies into educational settings. Their positive attitudes are an important measure of willingness and the first step towards effective integration. As Baylor and Ritchie (2002) explain that, teachers should become effective agents to be able to take advantage of technology in the classroom. Likewise, teachers who have positive attitudes toward technology feel comfortable in using it and thus integrate it into their teaching (Kersaint, 2003). Bullock (2004) emphasizes that teacher attitudes can either enable or disable technology adoption; i.e. the success of any transformation to integrate technology into educational practice depends greatly on the support and attitudes of the intended user (Woodrow, 1992).

One of the pioneering studies was conducted by Jimoyiannis and Komis (2006) probing secondary education teachers' attitudes toward technology incorporation. The results indicate that there is a clear increase in teachers' attitudes toward technology usage for pedagogical causes. Albirini (2006) examined the attitudes of Syrian EFL teachers with

a focus on computer traits, computer competence, and computer access. This study's findings revealed that teachers with a positive attitude had the intention to learn about computers and to use them in their teaching practices. This is also consistent with the findings done in Turkey by Ng and Gunstone (2003), who have shown positive attitudes toward technology and computers. Another study, designed by Samak and Tawfik (2006) in Jordan, explored the factors affecting EFL teachers' attitudes towards technology integration. Findings revealed that teachers had a positive attitude towards technology usage.

Mumtaz (2000) clarified that teachers' attitudes toward technology use can vary from extremely positive to extremely negative depending on the combination of different factors (Mumtaz, 2000). Chai, Khine, and Teo (2006) could classify those factors into two groups; first, external environmental factors like technical concerns, resource availability, time constraints, educational software, training; second, the teacher's personal characteristics such as age differences, gender, teaching experience, self-confidence, ICT knowledge, ICT skills, and motivation. Via these factors, it could be concluded that the human nature such as gender and age, have an influence to change the non-heritably acquired characteristics of a person such as confidence and knowledge, which had the potential to change the attitudes of teachers.

The literature points out, for instance, a lack of consistent results on gender issues (Shapka & Ferrari, 2003). While Ertmer, et al (1999) declare that male teachers have slightly more positive attitudes than their female counterparts. Nevertheless, other studies reported little or no differences in teacher attitudes on the basis of gender (Koszalka, 2001). With regard to age factor, while some studies identified that there is no significant relationship between age and attitudes (Woodrow, 1992). Nonetheless, the results of other studies revealed that older teachers have more positive attitudes toward computers use than young teachers, yet had less computer literacy (Y. K. Choi, 1994). Accordingly, teaches' attitudes towards technology use, whether positive or negative, affect not only how teachers respond to technology in an educational setting or learning environment, but also the experiences of the learners who teach them. This, in turn, impacts the academic motivation of learners and their response to technology use (Teo, 2006). Thus, the success of learners' learning using technology would therefore depend basically on the attitudes of teachers and their willingness to embrace the technology (Teo, 2006). The last claim paves the way for the next element which isstudents' attitudes towards technology.

1.3.4 Students' Attitudes towards Technology

Today's learners are called "digital natives" (Prensky, 2001); likewise, Tapscott (1998) names them "net generation". These expressions describe the state of learners who are born in a unique world that is technology-based. Prensky (2001) claims that the new generation is exposed to a massive amount of information since infancy. Consequently, their way of thinking and processing information is faster. For that reason, teachers need to make a shift from the traditional teaching approaches in both content and methodology of learning. For example, in EFL classes where instructors still use the traditional approaches, the conscious awareness of technology improvement should encourage its use as a part of the EFL environment's demanding. If technology is applied in the classroom, the attitudes of both teachers and students towards this sort of innovation would change. Nonetheless, if the change is extreme and sudden and students perceive the experience negatively, they may resist these changes, which in turn would lead to poor academic performance.

Researchers Ashburn and Floden (2006) assert that both learners and instructors experience benefits in learning environments where technology is integrated. In other words, the use of technology in the classroom includes both teaching and learning because it supports teachers as well as guides learners. Hence, teachers are concerned with successful teaching that will engage learners in meaningful learning (Koehler, Mishra, Hershey, & Peruski, 2004). It was believed that the degree to which it is incorporated depends on the positive attitudes of users towards it no matter how sophisticated and powerful the state of technology is. Moreover, Sang, Valcke, Van Braak, and Tondeur (2010) investigated the influence of Chinese teachers' gender, teaching beliefs, teaching self-efficacy, computer self-efficacy, and computer attitudes on learners' potential to use technology. Their findings revealed that students' attitudes were significantly associated with all teacher-related variables, except for gender. That is to say, if teachers do not positively reflect technology, students would feel negative and exhibit negative attitudes towards it. Based on the aforementioned claim, attitudes towards technology play an influential role in determining the degree to which students use technology as well as help them in the future such as using it in their jobs (Teo, 2006, 2008).

The relationship between attitudes and behavior was examined by researchers who are interested in technology acceptance and adoption. According to Heinich, Molenda, Russell, and Smaldino (2005), technology usage increases the learning capacities of learners along with their motivation so that they become more involved in the learning process. They want to say that technology encourages learners to advance their learning and motivates them in a positive and innovative way. Sankaran, Sankaran, and Bui (2000); likewise, highlight the positive connection between learners' attitudes towards the technology-supported course format and their performance, i.e. the performance of students who prefer technology-supported courses did better than those who were presented in the lecture format. In the same line of thought, Khine (2001) endorses previous researches by arguing that affective attitudes, general usefulness, behavioral control, and pedagogical use are the main elements that determine technology use. Accordingly, learners' attitudes, whether positive or negative, impact the way they respond to the materials presented in a given learning environment.

1.3.5 Video as a Multimedia Learning Tool

Higher education learners in the twenty-first century vary from previous generations of traditional learners (Thornton & Kaya, 2013). In fact, the Net-Gen's has been easily manipulated all the pervasive digital media so that these media entered the worldwide classroom environments. In the ELT context, techniques are ranged from the use of manual or visual media such as blackboards, chalk, and markers to internet-based media and technologies such as audio-visual materials have gradually evolved. Hence, EFL/ESL teachers have to consider other innovations relevant to the teaching/learning setting in order to introduce them in the classroom. To be precise, it is significant to think of any motivating and effective strategies that help stimulate and support learners' learning. Technological advances have led to a renewed interest in the educational community in multimedia learning materials. Recent interests, for example, do focus on the educational merits of multimedia for developing learners' learning as audio-visual materials play a crucial role in stimulating and facilitating foreign language learning. According to Wright (1976), several media and techniques of visual presentation are beneficial to language learners. This means that as long as they are used in the right place and at the right time, all audio-visual resources contribute positively to language learning. In language learning and teaching processes, multimedia takes various forms, including words and pictures, and can

present printed and/or spoken content. Pictures may be either a static model, like illustrations, images, graphs, charts, or maps, or a dynamic model, like animations and videos (Richard E Mayer, 2011). With that being said, the use of educational multimedia can take several formats, such as learners watching and listening to a narrated animation, reading a science textbook, playing an educational video game, attending a PowerPoint presentation, or watching and listening to an educational video.

P. Chandler (2009) identifies educational video as an effective strategy that enables learners to gain knowledge because of its capacity to present multiple representations, dynamic and meaningful learning content (P. Chandler, 2009). In language learning, the use of videos in education can be traced back to the Second World War in training situations (A. C. Chandler & Cypher, 1948). Video materials have received a tremendous level of attention as they bring authenticity, reality, flexibility, and diversity to the EFL classes and curriculum development, in contrast to the traditional resources that may fail to adapt to the needs and interests of learners (Stoller, 1988). Recently, video usage has enhanced over the past decade to become the one of the most common forms of learning. Several experimental studies on the dynamic usage of audiovisuals in education have shown that students prefer educational video over text as they gain deep learning from video than from words alone (Richard E. Mayer, 2005). That is to say, in addition to spoken language, video materials are an incredibly intense medium that combines a wide range of visual elements and audio experiences.

Asokhia (2009) emphasizes that video materials are a form of audio-visual aid that allows students to learn a foreign language by simultaneously listening and watching. Along the same line of thought, video materials are considered vital tools in foreign teaching language due to its association with communicative language teaching in addition to its role in facilitating language learning (Richard E. Mayer, 2005). Furthermore, videos' usefulness lies in exposing foreign language learners to the natural uses of the language by native speakers present in movies, news, TV advertisement, broadcasts, professionally designed tapes, etc. Learners can learn paralinguistic traits such as gestures, body language, and different expressions through video aids. Videos, in addition, can carry the real language and culture into the EFL classes, i.e. learners can learn how individuals behave along with the aspects, customs, and values of the target culture by watching videos.

Audiovisual aids include two representations; first, visual that conveys information about objects and their relationship with other objects; second, verbal that communicates abstract meaning and special attributes of the information. A combination of both representations would increased the positive effect on learning (Schär, Kaiser, & Krueger, 1999). J. S. Brown, Collins, and Duguid (1989) stress that when a student processes and reprocesses data, each channel reinforces the other so that adding to the authenticity and reality of the learning context. Consequently, videos may expand learning to visual or episodic memory through visual and auditory messages and help facilitate the dual coding of information by students. Moreover, students would be able to free up cognitive resources to manage and integrate information more effectively and efficiently if they watch the changes of visual data instead of mentally inferring it (Schnotz & Rasch, 2005). For instance, videos enable students to analyze complex natural processes, observe laboratory experiments etc. In the field of instructional design, researchers talked about the effective use of multimedia to increase learning as well as the effect of video on learning itself (Guo, Kim, & Rubin, 2014). Richard E Mayer and Moreno (2003) mention that videos allow the complex interaction between the two channels. i.e. the visual and the auditory processing channels of incoming data are identified in the cognitive load theory of multimedia learning, which is the interest of the present investigation.

1.3.6 Types of Videos

Some sorts of videos may be used for language teaching in the classroom, such as videos taken from TV, news broadcast, or videos deliberately designed for language learning. Nonetheless, the classification of the types of video used in the classroom was of interest to researchers who attempted to categorize them based either on the content or the information conveyed.

For example, King (2018) puts together a list of different types of videos by considering their content. The following are some video types; the first type is: *"Promotional Videos".* This kind of videos brings to light and highlight a particular issue; it describes what and why this issue happens. For the second type which is *"Explainer Videos"*; its goal is to explain something to the viewer rapidly and efficiently. An explainer video is a short-form video that can be animated and there is generally an audio narration explaining what is being displayed in the video. *"News Videos"* are not intended to clarify

or explain how something works, but rather to share news about something that has happened. *"Fun Videos"* may include memes, parody videos, and comedy sketches. They make people smile while conveying information to the viewers. *"Trainer Videos"*, are also referred to as tutorial videos; it is about explaining the process or the steps needed to do something, i.e. quick-tip videos and how-to videos. Finally, we have *"Live Videos"*. On this type of videos, David Lee King claims that live videos are the latest type. The latter have become more common because the way of operating them is much easier for users than it has been before. They can be used as a medium, an app or a social media channel. This type refers to a live broadcast like a TV news show, with the feature of interacting with users, where they can watch, like, comment, and share. Webinar video, for instance, is a type of live video in which the teacher can host webinars for learners. That is, instead of having learners in the class, the teacher can do a webinar and allow them to participate live (King, 2018).

In the same line of thought, J Harmer (2001) identifies three specific types of videos that can be used in the classroom. First, *"Off-Air Programs"*; this sort of video form is captured from television channels and programs. The instructor can decide from these programs certain tasks that support language teaching and learning by considering the length, comprehensibility, and learners' interest. The second type of videos is "*Real-World Video*". This sort of videos might be taken from feature films, documentary movies, or exercise manuals. *"Language Learning Videos"*; is the third sort of video which is designed mainly for language teaching with considering students' level, topic interest, and the comprehensibility of language study. What is interesting in language learning videos is that some of them may accompany the course book (J Harmer, 2001). Therefore, the choice of the appropriate video type that will be presented in the classroom should be based on what the classroom will be.

1.3.7 Listening Skill and Multimedia

The skill of listening in teaching English as a foreign language is one of the basic abilities that build the communicative competence of learners. In other words, learners need to cognitively perceive and decode the auditory input in order to be able to produce the target foreign language and communicate effectively.

1.3.7.1 Listening and Comprehensible Input Theory

Listening is an interactive operation that includes the process of receiving sound waves as well as the process of the brain that acts on the impulses of the nerves and uses the different complex cognitive and affective mechanisms. In simple words, listening is a dynamic and active process of interpretation in which listeners have to relate what they listen to with what they already know. Since listening comprehension is an active process, listeners are not only required to apply linguistic knowledge, but they have to act synchronously by making use of both linguistic and non-linguistic knowledge as receiving messages to constructed meaning. The meaning produced will depend on the background history of each listener. First, in short-term memory, the listener processes "raw speech" and carries a "picture" (phrases, clauses, stress, intonation, etc). Then, the type of speech treated is determined as a speech, a radio broadcast, a conversation, etc in order to decide the speaker's objectives by considering the type of speech, the context, and content. i.e. whether the speaker wants to persuade, request, affirm, deny, inform and so forth. After that, the listener recalls schemata - background knowledge relevant to the specific context - for the execution of cognitive association, thus, bringing a reasonable interpretation to the message. The listener, moreover, would allocate a literal meaning to the utterance, then an intended meaning. Finally, she/he would decide whether to keep information in short-term or long-term memory by deleting the form in which the information is conceptually retained.

In real life interactions, listening entails complex interpretative processes that determine the meaning derived as the result of an exchange. According to Meskill (1996), all theoretical models for listening are based on the idea that it cannot be simplified to a receptive action, due to the fact that simultaneous involvement of various physiological and cognitive functions is required. Meskill (1996) adds, in TEFL environment, conversely, listening entails a complex activity that facilitates the acquisition of the target language and skill that plays an essential role in the communicative competence of a foreign language. That is, an EFL student acts passively when receiving the aural input (Gough, 1993). Meskill (1996) demonstrated that meaning is inferred in a natural conversation as an outcome of the interaction of different factors, such as the subjective experiences of a person and a set of visual cues (facial expressions, eye shape, gestures, etc). Furthermore, face-to-face communicative situations allow multiple modes of

information delivery in which the listener may simultaneously use various receptive channels to deduce the meaning. In contrast, an EFL learner who is exposed to a traditional audio recording, as stated by Gough (1993), is restricted in reception because he/she has to rely on only one perceptual modality. In the same line of thought, Krashen (1992) argues that the listening skill has a crucial part in acquiring a new language and has been the cornerstone of many theories of second language acquisition (Krashen, 1992). In such acquisition theories, one of the crucial roles of the listening skill is "Comprehensible Input Theory" which is credited by Krashen in the 1980s. Krashen believes that a second language is learned most effectively if the input is modified and made clear to the learner in the early stages along with the production demands. This theory suggests that exposure to authentic listening and reading texts facilitates an implicit process. As a result, new language and linguistic rules become internalized and can then be mechanically reproduced.

1.3.7.2 Multimedia Material Supporting Listening

Technology-based materials for practicing listening are not built in an adequate way that is flexible, authentic, and interesting. They provide the target language in a way that is adapted; missing real context and authenticity of natural speech. This implies that effective pedagogical strategies have to be used in performance with technology or multimedia in order to be effective as they are originally predicted as Jones (2008) explained. However, current EFL instructors do not have to rely solely on those rigid listening resources in an age that is technology and Internet-based as long as they can also make use of other different resources, such as video clips, TV and/or radio broadcasts, movies, documentaries, audio books, etc.

In fact, multimedia is the modern educational instruction for listening as the materials provide an important resource of input that, in turn, allows for multi-modal processing that simulates the complexity of authentic listening in the spoken interaction more than in the traditional audio recordings. Learning using multimedia allows the brain to encode two different forms of information simultaneously; visual and auditory stimuli. It was predicted that these challenging channels of information would tend to burden and overload the learner. However, psychological research has shown that verbal knowledge is best memorized when accompanied by visual representations (Baddeley & Hitch, 1974).

Baddeley and Hitch (1974) projected a theory of working memory. The theory notes that human memory has two largely separate subcomponents; visual and verbal which function in parallel, i.e. simultaneously processing information received from learners' eyes and ears. In a study conducted by Jones (2003), the use of verbal and visual aids may lead to positive results in listening comprehension as learners are able to remember information better when supported by verbal and visual clarifications. ((Adnan, 2016) cited in Shapran et al, 2011) supported the previous claims; they said that multimedia, similarly to face-to-face communication and in contrast to traditional listening practices, allows for the multisensory processing of new knowledge; thus, learners can obtain information from multiple perceptual modes. Shapran et al. (2011) conclude multimedia-supported listening facilitates the combination of sounds and images in a manner similar to that used in a communicative situation outside the EFL environment. As a result, multimedia-supported listening resources should have a firm role in listening in the EFL classroom since they are crucial for acquiring language items in their natural form.

According to Meskill (1996) multimedia is able to develop the listening skill in the sense that media combinations could achieve the linguistic targets. Therefore, learners can give important input to the language acquisition process and videos as well as provide a comfortable atmosphere for teachers and students to benefit from in language teaching and learning. All the previous studies reviewed above have emphasized the value of multimedia supported listening; yet, this does not indicate that all studies propose that multimedia-based instruction is definitely better than traditional instruction regarding listening comprehension. juang Wang (2010) for example conducted an experimental study in China. The findings confirmed that there was no evident difference in listening comprehension between learners who performed the multimedia intervention compared to those who were taught in the traditional sense. Nonetheless, Wang's research study revealed that learners in the experimental group were more motivated than those in the control group to learn and do their tasks more frequently.

With respect to language learning, efficient receptivity can be related to the easiness of auditory processing that visual accompaniment implies. As a learning aid, videos can fill in gaps in auditory comprehension that reduces negative affects and increases the language learner at the same time. Several studies have scrutinized the efficacy of multimedia instruments in acquiring and producing a foreign language. As for using subtitled videos,

Grgurović and Hegelheimer (2007) integrated a multimedia listening activity so as to assist learners with language comprehension. Results showed that learners were stimulated to participate and interacted more frequently rather than with transcripts. Subtitled videos employed in listening appear to enhance comprehension, boost recall of information, and encourage more learner output (Garza, 1991). With that being said, as an instructional tool, videos are seen as a comprehensible, influential, and significant multimedia aid for teaching and learning a foreign language. The responses of students were positive partially due to their positive attitudes towards the medium with which they are prompted (MacWilliam, 1986). Multimedia-supported listening activities, if appropriately implemented, develop the ear of an EFL learner's practice and raise their listening competence in the target language. Richards (1985) listed the advantages of video on listening comprehension; then, some modifications were made by Meskill (1996). The advantages are listed below

- Relating new information with previous one; the process of remembering and recalling of information.
- Distinguish between phonetic groups and their limits.
- Identification of supra-segmental aspects (stress, rhythm, and intonation) and how they affect information and meaning.
- Decoding vocabulary and sentence structures of the auditory transmitted message.
- Understand the communicative implications of utterances according to context.
- Processing different speech errors, styles, and rates.
- Deduce meaning and predict it using background knowledge.
- Obtaining new information through a variety of perceptual modalities.
- Attracting the attention and interest of the listener.
- Enrichment in target language acquisition.

The above early studies have reviewed that multiplying input modalities motivate students and draw their attention to auditory input. Accordingly, the cognitive requirements of multi-modal processing may entail improved comprehension, hence enhanced task determination. Multimedia has been generally approved to afford several benefits, including interactivity, accessibility, authenticity, and integration of text, audio, and visuals owing to the principles of practice that instructors or instructional designers

focus on when designing or incorporating multimedia-based listening comprehension aids (Stockwell, 2007).

1.3.8 Strategies for the Incorporation of Videos in the Classroom

According to ÖZKAN (2002), video use has gained growing focus in the latest studies on technology integration into EFL curricula. Video presentation is one of the crucial materials that enable students to practice what they have learned through a variety of techniques. Such a sort of resources may help to develop communicative skills through a dynamic, immediate, and accessible grouping of sound and picture. The role of teachers is to encourage students to be active viewers. Students, in turn, should not be passive viewers but they have to participate in the tasks and perform projects using the target language such as, interviewing and reporting. Thus, effective outcomes in teaching language through videos necessitate students and teachers to perform their tasks perfectly alongside the new methods and techniques in foreign language teaching (FLT).

It is important to choose the right video for a particular level of students before using video presentations in the classroom. Wong (1987) suggests several criteria to be taken into account when selecting an appropriate video presentation; thus, teachers need to ask themselves the following questions before choosing a video:

- *Motivation:* Will the video provide an opportunity to appeal to my students? Will it make them want to learn?
- *Learner's level fit with:*
    - *Content:* Does the video content meet my instructional goals and objectives? Is it culturally appropriate for my students?
    - *Clarity of the message:* Is the instructional message clear to my students?
    - *Pacing:* Is the language and instruction rate suitable for my students?
- *Sequence length:* Is the sequence fitting enough to display?
- *Sequence independence:* Can this segment be understood without long descriptions of the plot, setting, and character that precede and follow it?
- *Quality of related materials:* What printed materials will accompany the video?
- *Use of videos:* How will I use the video? And what is the appropriate technique for my students?

- *Authenticity:* How closely does the video presentation correspond to what students are likely to be exposed to in the real world?
- *Impact:* What opportunities does the chosen video resource provide in terms of enhancing students' comprehension?

In an attempt to explore the above-mentioned criteria regarding the use of videos that fulfill defined language objectives so as to meet stated students' needs, a tentative framework was developed by a set of authors in the book of *Video Applications in English Language Teaching* (1983); the framework is designed to help teachers establish more explicitly the potential roles of videos in the ELT classroom.

It is important to select a video presentation that closely matches what students are likely to encounter in the real world, but it is also important to choose videos that are suitable for students' own culture. This means that teachers need to be aware of students' culture that might not be appropriate for presentation in the classroom. Another significant issue related to choosing a video is the use of a variety of video formats such as news, documentaries, cartoons, movies, and so forth. That is to say, focusing on one type of video may make students feel bored and disinterested.

It is commonly accepted that the above mentioned stages about video selection should be presented with a shorter language unit. This is just a general rule; the length of a video is to be determined based on what students are expected to do; either to imitate and summarize or simply understand certain elements. What matters, here, is the active role that students should play when they are presented with a meaningful presentation, i.e. being able to process the received information. For example, the length of the video presentation shown in class may be an entire unit in itself or part of a longer unit. Since each program contains various short sequences, each is suitable for being exploited in a different step for one or different purposes (McGovern, 1983). The combination of the subject matter and the message that need to be relevant and interesting for the students are the video's face validity markers; the extent to which a video is subjectively viewed as covering the concept it purports to convey.

Moreover, the accompanying printed materials, such as textbooks and worksheets, should be carefully examined along with video presentations intended for use in English language instruction so that they meet the instructional needs of the learners. Before

concluding, it should be noted that at every step, teachers should be aware of constantly reconsidering objectives as a result of students' short-term achievement upon completion of the learning cycle. In fact, it is clear that these objectives will evidently need to be adapted and made more specific to meet the needs of particular student groups.

In EFL classes, the way teachers use videos presentations is not something new. Nevertheless, teachers are challenged to be able to effectively deal out with videos. As facilitators, teachers should be able to prepare appropriate videos based on the needs of students and design innovative techniques to make them efficient, mainly in engaging students to become active participants. In fact, there are various techniques suggested by Cakir (2006) that teachers can apply, such as active viewing, freezing framing and predictions, silent viewing, partial viewing, sound on and vision off activity, repetition and role-play, reproductive activities, dubbing activity, and follow-up activity.

J Harmer (2001), on another hand, has proposed another series of activities that are intended for a particular video situation. For instance, in general comprehension activity, students are requested to watch a video in order to understand first, the gist, and then the details. They have to make an attempt to provide as much information as possible about what they saw in the video. The second activity deals with language aspects. In this activity, students are asked to extract the meaning that speakers intend to convey through the uttered expressions. In other words, students should focus on the speakers' language use so that they can compare their language with the language spoken in the video. The third activity is used to elicit students' creativity by encouraging them to interpret the conveyed meaning by provoking thought, and asking for language. It allows them to obtain more thoughts about the language being used and it directs them to consider behaviors.

Bouman (1990) has a different perspective in which he suggests five steps to use videos. The first step is previewing (anticipating) which aims to trigger the background knowledge of students "schema" as identified by Bartlett's, through discussing the presented information. The second stage consists of viewing (presenting). In this stage, the video is shown either with or without sound, and the whole or part of the video. The next step is for exploiting (comparing, rehearsing, communicating); the video is intended to discover language features, such as vocabulary, pronunciation, and intonation, as well as focusing on non-verbal features. The following step is about reviewing (reinforcing); the video strengthens what the students have already learned during the preceding stages. The

final step is about a number of following up (consolidating) activities that aim at improving the communicative competence and stimulating responses and creativity in students' use of the target language.

The usage of video presentations in a foreign language course can be optional or compulsory, additional or integral, and indirectly linked, directly linked, or necessary to other course content. Frances Macknight (1983) argues that "the video is most widely used to introduce and stimulate interest in a topic, to give information on cultural background and for general language spin-off" (McGovern, 1983, p. 7). This claim implies that using video presentations can always be beneficial. Nevertheless, several components, such as students group, the type of video material, and the function it is expected to execute differ widely when they are handled within the lesson. For example, the lesson time occupied by the video component varies significantly but broad elements can be identified. Jane Willis (1983) encourages teachers to develop new activities of their own that are likely to produce practical and innovative video use taking into consideration, as Jane Willis claims, "the language objectives (adapted where necessary to suit our own students), the units of text we have available on video, the possible roles of video, and sequence length" (McGovern, 1983, p. 53).

In short, teachers should first start from the subject and sequence length, identifying the sequences from the target video that best meets the instructional objectives along with the students' needs; then, at this point, teachers have to think about the potential video roles, and lastly they must choose suitable activities to exploit the language of the video sequence. According to Jane Willis, "if we, time and again, choose an interesting video sequence of a suitable length and complexity, contextualize it well, state our teaching objectives in such a way that our students understand, then get them to take part in two or three purposeful activities that have real outcomes and give our students a sense of personal achievement, how can we fail?" (McGovern, 1983, p. 54). Willis (1983) concludes that the same essential pedagogical and linguistic principles that need to be applied must certainly remain. Regardless of the material, format, or combination of materials are used it would opening rich possibilities for video usage.

1.3.9 Techniques for Video Implication in the Classroom

When teachers use videos in English language classes as a media teaching and learning tool, they face the challenge of actively engage learners. Canning-Wilson (2000) believes that since it is a commonly used tool with students, EFL teachers should value the educational purpose of the video in the language classroom. Therefore, the effective use of videos as a tool during teaching and learning activities necessitates considerable planning before attempting to apply other ways that motivate students to become active. For instance, Jeremy Harmer (2006) mentions various techniques that could be applied when using videos in EFL classes, including: viewing techniques (freezing framing, fast forward, partial viewing, silent viewing) and listening techniques (picture of speech and pictureless listening). In addition to Harmer, Cakir (2006) adds several other techniques, among which are: active viewing, repetition and role-play, silent vision, sound on and vision off activity, freezing framing and predictions, etc. Hence, in the next section, we will thoroughly explain the list of various techniques used in the classroom to achieve effective results using videos in language teaching.

1.3.9.1 Active Viewing

Active viewing is the technique that boosts the enjoyment and satisfaction of students while concentrating their attention on the video's key ideas. The teacher, first, asks her/his students several basic questions about the presentation so that they can get an overview of the content. Then, students answer questions either orally or they may take notes when watching the video. After that, students are given a guide sheet or presentation guide in order to watch and listen for specific details or particular features of language so that ensures a more detailed comprehension. Through the use of the active viewing technique, students can actively participate in the video teaching presentations.

1.3.9.2 Sound on and Vision off Activity

In this process, parts of the video unit are played; however, by obscuring the image, the visual elements are removed from the presentation. Students are, therefore, only able to hear the discourse, but unable to see the action. Sound on and vision off allow students to make predictions and guess what has happened visually depending on what they have heard.

1.3.9.3 Freezing Framing and Prediction

This activity develops students' imagination and curiosity as they are allowed to view portions of the video presentation; then they are directed to infer and speculate what will happen next. Since video presentation offers extra elements of information about character body language, facial expressions, emotions, reactions, and responses, the teacher may freeze the scene to teach words and expressions about moods and feelings, to ask questions about specific scenes, or to attract students' attention to particular points.

1.3.9.4 Silent Viewing

In silent viewing, the teacher plays the video without sound using only images. In this case, silent vision stimulates students' interest, arouses thought, and increases anticipatory skills. This activity can be accomplished by playing the video segment with the audio off and ask students to notice the behaviors of characters and then use their deduction skills. Subsequently, the teacher presses the pause button to stop the image on the screen and asks students to guess what happened and what the character would say. To finish, the teacher played back the video segments with sound on so that students can compare their impressions with what happened in the video.

1.3.9.5 Repetition and Role-Play

This technique suggests that repetition can be an essential step in communicative production exercises when there are some complicated language points in the video unit. After gaining a clear understanding of the video presentation, students are asked to act out the scene either individually or in chorus using the original version as much as they remember. When students perform a certain role, they are progressively more engaged so that they better understand the behaviors and become more likely to respond positively to different human relationships. In other words, role-playing is a useful communicative task and accurate training for real-life situations.

1.3.9.6 Reproduction Activity

Reproduction activity supports students to try their knowledge as they are permitted to view only part of the video, then, they are asked to reproduce what was said in order to

explain and write or retell what happened. Although it is challenging and errors are made, with guidance and assistance, students will benefit from experimenting in English.

1.3.9.7 Dubbing Activity

Completing scenes from video dubbing can be an interesting and enriching activity for students. The dubbing activity can only be used in the classroom if students have the requisite language competence. In this action, students are asked to fill in the missing dialogue after viewing a sound-off video episode.

1.3.9.8 Follow-Up Activity

In fact, discussion arouses communication between students and helps them achieve communicative competence, thus, for further oral practice, it is crucial that the video presentation be the basis for follow-up activities. With this follow-up activity, students have the opportunity to increase cooperation and sharing skills.

In brief, it can be concluded that the use of technology in the classroom is unavoidable at present. When used properly, as Katchen (2002) said, video is quite advantageous to both students and teachers as long as the videos are carefully selected, i.e.; video can be a useful and highly motivational teaching aid to practice listening skills and stimulating speaking and writing.

1.3.10 Teacher's Role in Video-Based Classroom

Teachers play an important role in the use of videos as a medium to teach the English language since they are responsible for developing an effective environment for learning the language (Cakir, 2006). Therefore, teachers face the challenge of designing video-based tasks that can actively engage students while teaching and learning. Preparation is one of the main ways to make its use meaningful as a powerful aid during teaching and learning tasks, before moving on to the next steps that place students in the active mode. In this case, videos should not be considered as a tool that overshadows the teacher, yet they are a valuable aid to facilitate English learning and teaching. This implies, according to Cakir (2006), that video-based activities cannot replace the teacher as what makes it a significant tool is that it teaches the elements of English in an attractive and engaging way. In a video-based learning environment, teachers are as effective as videos because they

have other roles to perform, they can be controllers, assessors, organizers, prompters, and participants.

In any classroom, many things happen simultaneously. As a controller, the teacher is the only one who has to control and reason about events that occur. Teachers have rich knowledge about their students, the curriculum, and department context, and they use this detailed knowledge to make sense of what they observe; the teacher has to decide what needs immediate consideration, what students do, and when they have to talk while watching the video. In teaching a foreign language through videos, teachers should be organizers and know exactly what should contribute to a successful activity. They should give adequate information and clear instructions about what students will watch and what their task is. Another role the teacher carries is being a prompter, which is why it was previously said that videos cannot substitute teachers as they are the only person helping students understand what they watch and hear using some communicative techniques. For instance, in silent viewing, students are expected to be motivated to participate. Moreover, the teacher can be a participant while teaching using videos. This involvement helps students feel comfortable so that facilitating learning. After all, the teacher is an assessor who observes and reflects upon students' work in order to see how well they are performing (J. Wang & Hartley, 2003).

These factors lead to an understanding of the complex classroom environment. The teacher must be prepared to facilitate and improve successful language learning. This requires being familiar with the video materials before they are used in the classroom alongside developing a plan for each video unit that is related to the language level of the students.

1.3.11 The Goals of Teaching with Videos

Videos are one of the valued aid resources applied to language learning and teaching. Cennamo (1993) has analyzed several studies' findings on video-based teaching. Therefore, she sorted three main features that could potentially affect teaching and learning. The first feature identified is the content and the topic of the video to be discussed. The second feature is teachers' and students' perceptions about the usefulness of the video. The final feature of Cennamo (1993) is the purpose for which the video is used. As a rich and appreciated resource, students and teachers well-like the videos. For instance,

Canning-Wilson and Wallace (2000) reveal that through the use of videos, students enjoy learning the language as it affords different methods to language teaching and learning. In other words, students like video presentations because they are interesting, challenging, and stimulating to watch. It is therefore regarded as a language teaching aid material that is a crucial addition to teachers' resources in different areas of the English language.

In fact, it is documented that the use of video materials in EFL classes would present the target language naturally, facilitate learning, and motivate students with a lack of practice opportunities and exposure to native speakers. Moreover, it appears that EFL students who have studied English language courses in formal settings suffer from less use of the language and an understanding of its use in normal communication; either in the written or the spoken mode. As a result, due to the growing focus on communicative techniques, the use of video in English classes has increased rapidly in recent years. For example, the role of video materials in bringing authenticity, motivation, and variation to the classroom that traditional textbooks cannot offer, has been explored in several studies (Sherman, 2003). The following sections outline the different goals of using videos in EFL classes.

1.3.11.1 Authenticity

Video materials including movies, television programs, advertisements, songs, and so forth, were initially made for native speakers, and yet they also could provide EFL students with a degree of authenticity by creating a natural environment inside the classroom (Katchen, 2002). This means that videos provide authentic language input for students' learning. Due to its impact, many scholars stressed the importance of integrating video materials as a means of foreign language exposure in an EFL classroom (Sherman, 2003). Studies have confirmed that video presentations could help students be exposed to real language discourse, such as spoken phrases, a variety of accents, hesitations, real pronunciation, intonation, and rephrasing. Even without hearing the spoken language, clues of meaning can be obtained from the vision alone (Martínez-Flor & Usó-Juan, 2006).

Video presentations are a realistic depiction of reality that helps students not only understand the real use of the language, but also to see aspects of non-verbal communication, such as gestures, expressions, body language, and other visual clues (J Harmer, 2001). These aspects cannot be seen by means of created materials or textbooks

that are intended only for pedagogical purposes. That is to say, it enables students to become familiar with the use of words in various contexts and situations, thus, they are ready to communicate in the target language (Sherman, 2003).

In EFL classes, the use of videos has supported and been associated with Communicative Language Teaching (CLT) which emphasizes the communicative function of the language. According to Richards (2007), language teachers need to consider using more natural materials inside the EFL classroom for the purpose of enhancing communication and interaction among students. With that being said, language learning is more effective in a naturalistic environment than in an unnatural environment. Sherman (2003), for example, presents a credible argument on how video materials are used to convey the real language and culture into the EFL classroom, this argument demonstrates easy practical implications for video use in the classroom environment. The point that urges the value of authentic materials is that when listeners rely merely on the verbal message and not on visual clues to meaning, attitudes' interpretation becomes a complex process. Hence, video presentations provide students with practice in interpreting and understanding attitudes.

1.3.11.2 Culture

As language is an essential part of culture, it takes an important role in improving the cultural awareness and competence of students. Learning a foreign language is not limited to learning vocabulary, grammar, and pronunciation. Instead, learning a foreign language involves understanding its cultural aspects, beliefs, values, history, and social norms in order to use it accurately. According to J Harmer (2001), exposing students to the culture of the target language is a crucial benefit of using video materials in the classroom; through viewing video presentations, EFL students can be aware of the culture of the target language. Videos provide a chance to see and understand the social and cultural aspects of the English-speaking countries that textbooks barely provide. For instance, students can learn what concerns native speakers, from aspects, customs, values, foods, to the way they speak, what they wear, their traditions, and believes. Videos, furthermore, show EFL students the way people behave in the culture of the target language by bringing a wide range of situations close to real-life communication into the classroom (J Harmer, 2001). With that being said, through video's use, students can learn in different ways and relate to

various communicative situations, like the ways of invitation, accepting and refusing the invitation, ordering food in a restaurant, booking a hotel, and the like.

1.3.11.3 Motivation

In the process of learning English as a foreign language, motivation is one of the main factors that must be considered in each lesson, course, or program since a well developed and designed curriculum would only be effective if teachers sustain motivation in the classroom. As a consequence, the lack of motivation that may arise due to either the teacher or students has a negative impact on students' learning and can lead to learning failure. Bringing video presentations in the classroom is an enjoyable experience for students to get something different to learn the language apart from the textbooks for listening, thus, it is an efficient way to experience real-life, exploit the students' motivation, and guide to effective language learning.

In addition to other aspects, several studies have stipulated the significance of students' motivation, for example, Cakir (2006) argues that it is a well-known fact that audio-visual materials have an important role in stimulating and facilitating foreign language learning as long as the combination of moving and sound can present language more comprehensively and realistically. According to Canning-Wilson and Wallace (2000), videos are one of the most valued materials applied to language learning and teaching. J Harmer (2001), in the same line of thought, believes that when students are asked to watch a video, most of them are interested in performing the activity because they have the opportunity to watch and listen to the language at the same time.

Besides video presentations, movies also play an important role in teaching and learning by providing enjoyment and entertainment in the EFL classroom environment (Mishan, 2005). In other words, video materials stimulate students to acquire new words and phrases when learning a foreign language. Moreover, movies encourage students to engage in classroom discussion, practice oral communication, and share their feelings and opinions. Likewise, Huang and Huang (2015) advocated the use of video materials to motivate students, especially students with low English proficiency. In terms of student motivation, videos can be considered as one of those aspects that contribute to the learning of students by enhancing their attention and reducing their anxiety while watching the video (Schmid, 2011).

1.3.12 Advantages of Video Use in EFL Classroom

By having the capacity to speak a foreign language successfully, EFL students are expected to practice good oral skills so that they can respond and engage in conversation efficiently as they have to comprehend what was said, know word pronunciation, and use language in context (Redfield, 2003). According to Altman (1989), the incorporation of authentic materials such as videos into language teaching and learning has become an essential aid tool for foreign language students to advance their learning process. This is why the use of multimedia materials to design and improve language acquisition has been urgent for teachers' aid materials. Besides, D. Brown and Warschauer (2006) emphasize that using videos whether in the classroom or at home, is the recent technique to learn English effectively. With that said, it is widely agreed that videos lead to a better performance on subsequent understanding and vocabulary tests because it is a way that engages students, reduces anxiety, provides immediate verification of their comprehension of what has been heard, and boosts motivation.

Technology-based materials are supposed to be effective as long as they are designed in a flexible, authentic, and interesting way, thus, benefiting students and teachers alike. Video presentations, particularly, bring the real world to the classroom, naturally contextualize language, and enable students to experience authentic language in a structured and controlled environment (Brooks & Arthur, 1999). Additionally, Brooks and Arthur (1999) asserts that video can provide realistic models for students to imitate for role-playing, and develop an awareness of other cultures through teaching appropriateness and suitability. The following section reviews some studies highlighting the role of incorporating video materials in the language classroom that can be used as a pedagogical strategy to increase different language skills, such as listening, speaking, comprehension, vocabulary, and proficiency.

1.3.12.1 Listening Skills

Lonergan (1992) argues that videos may include visual, contextual, and non-verbal clues with simultaneous visual and auditory stimulation for foreign language students, and this can compensate for any lack of comprehension arising from listening alone. In short, by providing images that express the auditory tones, videos can facilitate listening comprehension. For this reason, a major emphasis has long been placed to investigate the

effects of videos on developing listening and oral communication skills. Terrell (1993), for example, indicates that listening comprehension maintained by authentic material such as video affords intermediate EFL students with experiences that cannot be duplicated in traditional classrooms that are limited to teacher-student interaction and textbooks.

A research study conducted by Otero (2014), aims to examine the use of video presentations and information technology in the language classroom as innovative strategies for improving students' oral skills and communicative needs. The analysis of the study's findings reveals positive outcomes in which video presentations as an aid could enhance the communicative needs of EFL students. Another study carried out by Jones (2003) shows that students are able to recall information better when assisted with verbal and visual aids. Jones concludes that the use of verbal and visual annotations in listening comprehension was found to contribute to positive outcomes. Martínez-Flor and Usó-Juan (2006) also confirm the earlier claims noting that since video materials provide real scenarios with real pronunciation, intonations, and a range of English accents, students' listening skills, hence, will be improved.

All studies reviewed above have shown positive findings as far as video presentations' incorporation is concerned. Nonetheless, this is not the case for other researches in which the video is necessarily better than traditional instructions with regard to listening comprehension. To illustrate, an experimental study was carried out by T. Wang (2010) in China to investigate whether the use of multimedia tools when compared to the traditional teaching methods can lead to better listening comprehension findings. The results of the study demonstrated that there was no clear difference between the students who undertook the multimedia intervention and those who taught using the traditional strategies. On the other part, the study identified that students in the experimental group were more motivated to learn the language than those in the control group (T. Wang, 2010). This intends to assume that the use of technology in teaching listening skills tends to increase students' performance and achievement as well as leaned to act as a facilitator in the acquisition of newly taught materials.

1.3.12.2 Speaking Skills

Mastering the speaking skill is a difficult task for EFL learners because it necessitates simultaneous listening and comprehension that take place immediately. In

addition to the previously mentioned requirements, the speaking skill also involves mastery of various elements like fluency, accurate pronunciation, correct use of vocabulary, and other social and cultural elements. Since the effectiveness of learning a foreign language is determined by the proficiency of the spoken language, the process of watching videos in class requires a combination of listening and speaking which is necessary for consciously and unconsciously improving students' speaking skills (Martínez-Flor & Usó-Juan, 2006). Moreover, watching video presentations offers students with an opportunity to practice the language and participate in real debates, discussions, and activities as well as learning other facets of speech, such as arguments, invitation, agreements, and disagreements (Martínez-Flor & Usó-Juan, 2006).

1.3.12.3 Content Comprehension

Vocabulary deficiencies can make the completion of a simple task or activity difficult for EFL students. As various researchers have stated, videos can be exploited to develop comprehension skills (Sarani, Behtash, & Arani, 2014). Therefore, the additional significant factor for teachers that makes videos more interesting and engaging is that it helps to improve students' comprehension. Videos can facilitate understanding and make the meaning clearer so that confirming a well-known saying that "a picture is worth thousand words" by demonstrating relationships in a manner that words alone cannot express. For instance, H. J. Choi and Johnson (2007) carried out a study with psychology students. They reported that videos were a more useful tool for teaching than text to present real-life scenarios in order to increase students' comprehension, retention, and satisfaction.

In fact, it is evident that non-native speakers of a foreign language rely on visual clues to support their understanding; as a matter of fact, videos are a potential aid material that could enable students to accurately interpret the visual clues. J Harmer (2001) points another key benefit to videos related to comprehension. He believes that videos afford contextual clues, gestures, and expressions that support not only students' listening skills but also their comprehension skills. A further study with students of English and Management reports that video presentations could boost the contextual factors of learning alongside the emotional engagement in the learning process as a whole (South, Gabbitas, & Merrill, 2008). Additionally, when students watch language in use through videos, they can join between words and images and analyze language use in natural contexts. That is,

linking knowledge to related tasks, activities, contexts, as well as cultures in which it is used (J. S. Brown et al., 1989).

1.3.12.4 Vocabulary Retention

Researchers believe that information displayed in the visual format is more memorable; however, the combination of audio and visual information would support better retention (Kozma, 1991). This means that, unlike the expected traditional static lecture format, videos naturally seem to provide students the ability to conveniently store the information in long-term memory. Pelton, Allen, and Nugent (1982) are the pioneers who suggest that combining audio and visual information improves retention than information provided by a single format of information. Currently, learning a foreign language is not as a fixed experience as before for the Net-Gen, due to the new aid materials that are available. Students will actively watch, read, listening, and acquire information intentionally or unintentionally via class or out-of-class learning in an enthusiastic manners (Gee & Hayes, 2011).

1.3.12.5 Language Proficiency

Though foreign language teaching and learning focus mainly on textbooks as a standard teaching material, Koolstra et al (2002) ascertain the benefits of using multimedia-based materials on FL proficiency. According to Sherman (2003), video presentations can enhance the level of proficiency in the EFL classroom when used in combination with other types of materials. Therefore, the results of studies conducted by Watkins and Watkins (2011) have proven the effect of multimedia instruction on the proficiency of the EFL compared to traditional methods of teaching and learning (Watkins & Wilkins, 2011). Lange (2008) for instance, claims that videos may increase learning outcomes through stimulating participation and impact positively the learning processes.

1.3.13 Potential Limitations to Video Use

All aid resources, as far as making positive contributions to learning, video presentations have advantages in the language classroom as stated previously, in fact, there are potentially significant shortcomings compared to textbooks and certain hurdles to the effective incorporation of technology into language instruction related mainly to the misuse or overuse of these aid materials. However, it is widely accepted that video offers

several advantages, including interactivity, accessibility, authenticity, and integration of text, sound, and visuals (Sherman, 2003). Therefore, besides their benefits, the limitations of video presentations' should also be taken into consideration.

Thao (2003) for example listed different impediments to the effective integration of technology such as lack of appropriate skills and expertise, the difficulty of technology's implementation, and cultural resistance. A further obstruction is related to teachers' teaching styles and methods according to which the learning process will not be developed if teachers resist updating the pedagogical practices and keeping away from flexibility. Besides, the university's structural difficulties and even the wider educational policy system can also impair the efficiency of video-based instruction (Thao, 2003). Cakir (2006) shared some of the limitations stated by Thao (2003); he identified several pitfalls to video use among them, "cost, inconvenience, maintenance and some cases, fear of technology. Additionally, the sound and vision, quality of the copies or home-produced materials may not be ideal" (p, 68). Moreover, he stressed that teachers ought to be well qualified and trained to use and manipulate videos as if not, tedious and meaningless outcomes would be achieved.

Canning-Wilson and Wallace (2000), Canning indicates that teachers should avoid the use of distracters, violent stimuli, and overcrowding. Further, he added, the video is ineffective in the learning process when the visual is small; when reproduction is poor; when using stereotypes; when it is inadequately balanced; when it contains irrelevant captions; when it is far away from the textual illustration; when the picture is not esthetically significant; and when it offers extraneous information related or unrelated to the picture. However, Guariento and Morley (2001) observed that due to the difficulty of the foreign language and performance requirements, the use of authentic resources such as videos make lower-level students confused and unprovoked. That is if teachers were unable to carefully choose the simplest authentic texts, the possibilities for comprehensible input will decrease; hence, lower level students will feel frustrated and dissatisfied. Guariento and Morley (2001) emphasized that the material selected should also preserve a sense of responsiveness and attract students' interest. With all that said, the choice of videos has to meet language students' needs, learning styles, learning objectives, language level, and the like in order to achieve effective outcomes.

According to Dave Willis (1983), videos can be used excessively through an inconsiderate course design or by teachers who are exploiting its potential for efficient student control rather than efficient teaching. He argues that students enjoy video presentations mainly when it is new to them as it brings the impression of leisure that can make them pleased and satisfied whether they are getting benefits and learning or not (McGovern, 1983). Notwithstanding the evident benefits of multimedia, including instructional video, in presenting learning content in visual and auditory layouts, cognitive science researchers have denied that multimedia materials reduce cognitive processing abilities for synthesizing visual and auditory forms of information and extracting message semantics (Homer, Plass, & Blake, 2008). According to P. Chandler and Sweller (1991), when students are novices in a specific area of knowledge and lack sufficient prior knowledge to direct their attention, cognitive requirements improve, thus, the limited cognitive exhausts the resources available to process the materials related to the lesson. That is to say that learning and problem solving may be impeded.

1.4 Conclusion

The primary purpose of this chapter was to present a theoretical framework for the present investigation, namely video-based learning presentations and its effect on the cognitive load. The chapter discussed and reviewed the literature related to the use of video-based learning in relation to language acquisition. The theoretical and empirical insights gained from the literature review are taken into consideration in the design of the research methodology. The following chapter includes an account of the methodology used in the study along with a description of the blueprint of conducting the current research.

Chapter Two: Research Methodology

Chapter Two: Research Methodology

2.1 Introduction

2.2 Research Design

2.2.1 Quasi-experimental Research Design

2.2.2 Post-test Only Control Group Design

2.2.3 Quantitative and Qualitative Methods

2.2.3.1 Quantitative Methods

2.2.3.2 Qualitative methods

2.2.4 Mixed Method Approach

2.2.5 Triangulation Design

2.3 Research Setting

2.4 Participants

2.5 Data Collection Instruments

2.5.1 Placement Test

2.5.2 Post-test

2.5.2.1 Description of the Post-test

2.5.2.2 Post-test Scoring Scale

2.5.3 NASA TLX Questionnaire

2.5.4 Post-Treatment Questionnaire

2.5.4.1 Questionnaire Validity

2.5.4.2 Questionnaire Reliability

2.5.4.3 Pilot Testing the Questionnaire

2.5.5 Reflective Journals

2.6 Data Collection Procedures

2.6.1 Placement Test

2.6.2 Post-test

2.6.3 NASA TLX Questionnaire

2.6.4 Post-Treatment Questionnaire

2.6.5 Reflective Journals

2.7 Materials Used in the Study

2.7.1 Description of the Video Materials

2.7.2 Length of the Video Materials

2.7.3 Content of the Video Materials

2.8 The Experimental Experience
2.8.1 Pre-Experimental Phase
2.8.2 Experimental phase
2.8.2.1 Session One
2.8.2.2 Session Two
2.8.2.3 Session Three
2.8.2.4 Session Four
2.8.2.5 Session Five
2.8.2.6 Session Six
2.8.3 Post Experimental Phase
2.9 Data Analysis Procedures
2.9.1 Analysis of the Quantitative Tools
2.9.2 Analysis of the Qualitative Tools
2.10 Validity of the Research Design
2.10.1 Internal Validity
2.10.2 External Validity
2.11 Pilot Study
2.12 Ethical Considerations
2.13 **Conclusion**

2.1 Introduction

In the previous chapter, we have presented an overview of the theoretical concepts bearing on cognitive load and the role of video-based learning on language acquisition. This chapter accounts for the overall phases through which the research work progresses and presents the stages leading to the resolution of the issue at hand. It demonstrates the methodology utilized in the study, starting from the research design and the rationale behind using the quasi-experimental design. Also, it explains the research methods used, providing a rationale for choosing the mixed-methods approach to conduct the study. The population and sampling procedure, the research setting, data collection instruments and procedures, and finally, data analysis tools, are also thoroughly elucidated.

2.2Research Design

Each type of empirical research has a particular research design; the logical sequence that combines the study's empirical data with the research questions and so forth to its conclusion. De Vaus (2001) made an analogy between research design and building. He stated that no work schedule, materials or dates for the end of project stages could be entaileduntil the kind of building is being constructed. Likewise, before data collection and data analysis can start, research needs a design or a structure. What has to be done to complete the project is the work plan; however, a research design is not just this because the work plan flows from the project's research design (De Vaus, 2001). De Vaus added, "the function of a research design is to ensure that the evidence obtained enables us to answer the initial question as unambiguously as possible" (De Vaus, 2001, pp. 8-9).

Research design requires asking what sort of evidence is needed to answer the research questions or test theory in a convincing way. That is to say, a research design is viewed as the pattern that concords with data gathering procedures in an endeavor to answer the research questions and test hypotheses in a judicious manner. Thereby, the fact of researching within a proper design is undoubted by significant value as to the high potentiality this matching would guarantee to successfully answer the research questions or test the research hypotheses (De Vaus, 2001). Yet, if the researcher does not pay attention to these matters from the beginning, a failure to answer the research questions and an unconvincing conclusion will be drawn.

2.2.1 Quasi-Experimental Research Design

In order to fulfill the intent of answering the research questions, an experimental design was chosen as it is thought to suit the objectives of the current investigation for a number of reasons. First, the act of establishing a cause-effect relationship between independent and dependent variables, is by excellence, the maneuver of experimental designs. As Cresswell (2012) claims, the researcher attempts to control all variables that influence the outcome except for the independent variable, manipulates independent variables, and examines the effect that it has on the dependent variable or the outcome of the study (Cresswell, 2012).

The design of the present study follows a quasi-experimental design with a post-test only control group design assigned to both experimental and control groups, while experimental treatment presentations are assigned only to the experimental group so that the post-test results assess the differences between the two groups. The rationale behind this design, rather than the random selection, was the use of existing groups in the educational setting; two intact groups were selected to participate. Cresswell (2012) states that quasi- experiments include assignment, but not random assignment of participants to groups. That is to say, following quasi-experimental design is due to the impossibility of creating new random groups while there are already existing intact groups in the educational settings.

In order to have an idea about the learners' cognitive load during information processing and to highlight any significant differences between their performance after learning through video-based presentations, the present research implements a post-test only control group design to manipulate the integration of video-based learning presentations, which is the independent variable that tends to examine its impact on the recall of information presented, the knowledge gained, and the reduction of cognitive load of indicating the sample that represents the dependents variable.

Therefore, a post-test was administered after learners' had viewed the video presentation in order to assess the knowledge they had gained. Although it is expected that a higher level of knowledge would be gained for the experimental presentation than for the control presentation, a comparison between the learners' increase in performance in the experimental and the control groups was used to determine whether video-based learning

was successful in increasing recall of the information. In addition to this, an analysis of the rating scale questionnaire for the experimental and control helped to determine the learners' available cognitive capacity and ultimately infer the cognitive load elicited by video-based learning presentations. Consequently, the current design is conveniently intended to answer the research questions set and to test hypotheses formulated earlier and derived from theoretical considerations in an endeavor to determine particular causal effects and contingencies between the use of video-based learning presentations and the level of cognitive load.

2.2.2 Post-test Only Control Group Design

In experimental designs, the investigator is the active agent (Tappen, 2016); yet, the primary distinction between true-experimental design and quasi-experimental design is the degree of control they have over study participants and variables (Polit & Beck, 2008). As explained in the previous section, quasi-experiments are experiments where participants are not randomly divided into groups, and there may be no control group (Polit & Beck, 2008). Rather, the researcher compares non-equivalent groups or measures the same group periodically. Like experimental designs, quasi-experimental designs intend to reveal the causality effect between an intervention and an outcome. Experimental designs, nevertheless, have an advantage over quasi-experimental designs (Tappen, 2016). In the former, the research participants are allocated randomly to each group (experimental and control) and check for other explanations (such as confounding variables); it is likewise likely to be discarded across these groups. In the latter, participants are not randomly assigned into groups, so it is difficult to exclude alternative explanations (Cook & Campbell, 1979).

Harris et al. (2006) demonstrate that quasi-experimental designs are commonly used where randomization or the use of control groups is not feasible in social science and healthcare research. The different designs for quasi-experimental design were listed by Harris et al. (2006) as follows: quasi-experimental designs with a control group and pretest, called "Pre-test-post-test design with non-equivalent control group", quasi-experimental designs without a control group, and finally, quasi-experimental designs with a control group, but no pretest, called "post-test-only design with non-equivalent control group" which is the concern for the current study.

Since the participants in quasi-experimental designs are not randomized, there would be no equivalence between groups; thus, such sort of designs are called "non-equivalent groups" (Cook & Campbell, 1979). According to Cook and Campbell (1979), post-test only control group design is the standard experimental design that explicitly illustrates a casual relationship status; a distinction can be made between the independent variable and dependent variable. This design may be used in circumstances where randomization is unfeasible due to, according to Tappen (2016), ethical or practical considerations, or it is impractical to collect pre-test data; pre-tests are unavailable, inconvenient, or likely to be reactive. For these reasons, the researcher opts for this form of research design. As before the intervention, it is not possible to measure students' cognitive load. Polit and Beck (2008) emphasized the necessity of some prior knowledge about groups' comparability in relation to the dependent variable. In post-test only studies, the experimental group receives a program, service, or treatment (the experiment); the implementation of video presentations for the present research. Yet, the second group is the control group that receives nothing. The outcome measurements are taken from both groups (experimental and control) and then compared (Polit & Beck, 2008). That is after the intervention of the independent variable in the experimental group, measures of the dependent variable for each group are obtained.

In the present research study, the random assignment of participants to the treatment was not feasible; this prompted the researcher to use quasi-experimental designs. Indeed, randomization helps to reassure that the two groups (conditions, raters, occasions, etc) in terms of characteristics that might influence any observed variations in post-test scores are comparable or equivalent. Furthermore, a pre-test can be used to judge or validate whether the two groups were essentially identical in the outcome of interest (as in pre-test/post-test, control group designs). T-test is a type of inferential statistical test used to determine if there is a significant difference between the means of two groups, it is likely needless to use a pre-test to verify the equivalence of the groups. In this study, it is difficult to control all the significant variables that, even with the best experimental design, are expected to influence the findings of the experiment. Therefore, the researcher cannot inevitably be certain without confirmation that the treatment implemented was different in significant aspects from the treatment of the comparison group or that the treatment implemented (not other contemporary variables, factors, or events) formed the experimental outcomes. With

these issues in mind, the researcher opts for additional research tools – rather than the post-test – to remedy this gap and ensure the findings of the post-test.

The point of analysis in a non-equivalent control group post-test-only design, according to Cook and Campbell (1979), is to settle on the impact of an intervention compared to a control condition by comparing the post-test score in two non-equivalent groups. The between-subject test is typically used to examine the hypothesis, but the parametric test, the independent group t-test, or the non-parametric Mann-Whitney test may be used depending on the measurement of the outcome variable (Polit & Beck, 2008). Nevertheless, this design is the only setting for which the t-test is most advantageous. In addition, the researcher must ensure rigorous findings by taking into consideration effect size, significance level, and sample size (Tappen, 2016).

Cook and Campbell (1979) note that, even in the lack of the intervention's outcomes, the selection differences resulting from the non-random assignment could produce post-test differences between the two groups. In the same line of thought, Polit and Beck (2008) agree that covariance analysis of prior grades, test scores, parental occupation, etc. It could be used to clarify the variation in the effect variable related to extraneous variables. Thus, the influence of test significance is similar to that provided by the pre-test. Usually, when data are measured, uncertainty associated with that calculation can be found in error propagation. Gorard (2013) described it as the process of determining the doubt of an answer obtained from a measurement. Since the post-test-only design compares only the post-test scores of two non-equivalent groups (the experimental and control groups), the error propagation will be lower in this design compared to the non-equivalent control group with pretest/post-test design, which measures data before and after the intervention (Gorard, 2013).

In fact, this design has several drawbacks. The foremost weakness of this design concerns internal validity. San Jose State University claims that the extent to which a study establishes a trustworthy cause-and-effect relationship between a treatment and an outcome is particularly susceptible to threats to the internal validity because the subjects were not randomly assigned (Polit & Beck, 2008). The selection bias is an issue in this design as volunteerism is a common method of recruitment. Therefore, pre-existing variations between groups cannot be controlled due to a lack of randomization. That is, the non-equivalence of groups means that they can have different intervening experiences

because group members have different characteristics. This design, likewise, is deeply weak in determining the causal relationship. Initially, the design was described as a pre-experimental design rather than a quasi-experimental (Polit & Beck, 2008). Besides, the design is poor in distinguishing between outcomes attributable to the treatment and those due to uncontrolled extraneous variables. Another problem with the design deals with the absence of a pre-test employed to reduce variability in the dependent variable. It is often assumed that the random assignment, for example, accounts for this preexisting variability. Nonetheless, according to Cook and Campbell (1979), the good of post-test only control group design is that it can be effectively applied in natural settings with minimal resources, conducted with a limited number of participants, and is less complex with low error propagation compared to other designs, as well as it is less vulnerable to attrition and maturation risks.

2.2.3 Quantitative and Qualitative Methods

The research design may revolve around the nature of instruments and the type of the data collected. According to De Vaus (2001), designs are often linked to quantitative and qualitative research methods. On the one hand, experiments and social questionnaires are frequently viewed as major examples of quantitative research and are evaluated against the strengths and weaknesses of statistical, quantitative research methods and analysis. On the other hand, case studies, are often seen as major examples of qualitative research in which data are interpreted, study phenomenon within their context, and the subjective meanings that people bring to their situation are considered (De Vaus, 2001).

2.2.3.1 Quantitative Methods

The nature of the experimental design requires quantitative research that follows certain systematic steps for data collection and analysis. Quantitative research problems require explaining the quanitative relationship among variables; determining whether one or more variables might affect another (Cresswell, 2012). The quantitative method relies on measurement and the presentation of data in the form of numbers using survey questionnaires, standardized tests, and checklists to observe a student's or teacher's behaviors. Therefore, the current investigation used tests to gather numerical data which are contingent upon probabilistic statistics to deductively test the respective hypotheses. These tests are deployed to quantify the control and the experimental groups'

knowledge they have gained. Moreover, a rating scale questionnaire was administrated to students in order to provide statistical data to measure the perceived amount of cognitive load during a problem solving.

Furthermore, another questionnaire was used to reveal learners' perceptions of the use of video-based learning presentations. In quantitative data analysis, consequently, data were analyzed using mathematical procedures. Cresswell (2012) asserts that statistical procedures such as comparing groups or relating scores for individuals provide information to address the research questions or hypotheses.

2.2.3.2 Qualitative Methods

The current research involves human beings who can by no means satisfy the rigorous demands of objectivity; inevitably, the qualitative method is needed in this context. Cresswell (2012) stated that qualitative design is used when the complex nature of the problem needs to be understood more fully and in more detail. It allows the researcher to gain an understanding of the contexts of the participants' responses, explore the rationales and other deeper thoughts of the participants, and search for the essence of participants' experiences rather than doing measurements and revealing trends, relationships, or correlations as in quantitative research (Cresswell, 2012). Since qualitative research relies more on the views of participants in the study, detailed and profound data can only be obtained when the researcher becomes immersed in the field, has personal contact with the participants, and allows them to express themselves free of restraints.

According to Simon and Goes (2011), the qualitative method focuses on the participants' experiences of the phenomenon (Simon & Goes, 2011). Therefore, it is the researcher's stories, reflections, and other forms of presentation of experiences that matter. The phenomenon identified in the present study was video-based learning presentations' effects on learners' cognitive load. The aim was to explore students' experiences of the phenomenon; their involvement, attitudes, performance, reactions after the integration of video-based learning presentations. Qualitative data were collected through reflective journals from the teacher who is responsible for delivering those presentations and were analyzed to discover the participants' experiences. In this sense, teachers' reflective journals were used as a confirmatory tool to post-test, rating scale questionnaire, and learners' questionnaire. The understanding of things from the teacher's point of view will

create a rich and in-depth picture of the phenomenon under investigation (Simon & Goes, 2011). During the experiment process, teacher's reflective journals were based on eye-tracking measures which provide an in-depth contextualization of the process via a profound investigation of the realistic and experiential testimonies of first year EFL students at Si El- Haoues University Center of Barika.

When researchers write their thoughts in the form of journals, these journals' entries become a text database; with each form of data, the researcher will gather as much information as possible to collect detailed accounts for a final research report (Cresswell, 2012). In some qualitative studies, as Cresswell (2012) claims, the whole report is typically an extended description of several individuals. From this complex picture, the researcher interprets the meaning of the data by reflecting on how the findings relate to existing research; by stating a personal reflection about the significance of the lessons learned during the study. According to Cresswell (2012), a study may begin with a long, personal narrative told in story form or with a more objective, scientific report that looks like quantitative research. Good qualitative reports, however, need to be realistic and convincing to persuade the reader that the study is an accurate and credible account (Denscombe, 2008). This may also involve discussing personal experiences and identifying how the researcher collaborated with participants during the phases of the research.

However, the researcher must try to bracket own knowledge of the topic as much as possible to preserve an unbiased and nonjudgmental description (Cresswell, 2012). Consequently, both methods, qualitative and quantitative, should be used together to answer the research questions and test the research hypothesis. A mixed-methods approach is adopted in order to optimally approach the current problem.

2.2.4 Mixed-Method Approach

Resolving some research problems may compel the deployment of both numerical data and statistical analysis along with in-depth and rich contextual information. The core argument for a mixed-methods design is that it comprises the exploitation of both quantitative and qualitative approaches in a sole study so that providing a better understanding of a research problem than either quantitative or qualitative data by itself (Tashakkori & Creswell, 2007b). Therefore, to meet the objectives of the current research study, a mixed-method approach using quantitative and qualitative tools for data collection was opted for. According to Cresswell (2012), it was perceived as appropriate to

strengthen the findings and eliminate the limitations of either quantitative or qualitative approaches.

The mixed-method approach was defined by Tashakkori and Creswell (2007b) as "research in which the investigator collects and analyses data, integrates the findings, and draws inferences using both qualitative and quantitative approaches or methods in a single study or inquiry" (Tashakkori & Creswell, 2007b, p. 4). That is to say, mixed-methods designs are procedures for collecting, analyzing, and mixing both quantitative and qualitative data in a single study. Their purpose was stated by Denscombe (2008) as follow; improving the accuracy of data, producing a more complete picture by combining information from complementary kinds of data or sources, and used as a mean of avoiding biases, a way of developing the analysis and building on initial findings using contrasting kinds of data or methods, and an aid to sampling with. With that said, neither of the two approaches alone is sufficient to meet the needs of the study, to answer the research questions, or to test the hypotheses. As stated earlier, the current investigation entails the use of a mixed-methods approach to data collection and analysis procedures in order to provide a more holistic explanation and resolution to the research questions postulated previously. Both methods, quantitative and qualitative are given equal priority, and data are jointly gathered and analyzed.

The mixed-methods approach is intended to clarify the relationships that exist between the effects of video-based learning presentations and cognitive load. The research problems suited for mixed-methods are those problems in which one data source is not sufficient (Tashakkori & Creswell, 2007a). For that, the limitations of one approach can be counterbalanced by the strengths of the other one, and the combination of the two approaches was necessary as it would provide a full picture of the phenomenon under investigation than either approach by itself. Denscombe (2008) asserts that the use of qualitative and quantitative methods allows confirming and validating causal effects between the variables and renders an in-depth understanding of relationships between variables mentioned above.

Therefore, we contend that this approach is appropriate in this study due to several reasons. First, the research questions range between quantitative and qualitative; thus, using the mixed approach can be a suitable choice for the researcher to best understand the research problem, and accurately answer the research questions (Cresswell, 2012). Second,

the results of the qualitative method supports the numerical data and help gain additional insight for the quantitative method (Creswell & Tashakkori, 2007). That is to say, the need for a mixed-method approach is apparent because the researcher sees the need to explain the numerical data (i.e. learners' performance), by analyzing them qualitatively by means of teacher' reflective journals.

It is significant that within the mixed-method approach, data were collected sequentially; that is to say, a placement test to gauge the students' general linguistic level was administered first. Next, the intervention in the form of integrating video-based learning presentations was launched last for five weeks. After each video presentation, the post-test was accomplished along the rating scale questionnaire "NASA-TLX". All this was alongside with teacher's reflective journals. Finally, the students' perception questionnaire was conducted. As such both numeric and narrative information collected from the beforehand mentioned tools will be analyzed.

2.2.5 Triangulation Design

Triangulation is defined by Lodico, Spaulding, and Voegtle (2006) as the procedure of comparing multiple sources of data or perspectives of different participants in order to increase the validity of the research findings and the credibility of its conclusions. That is to say, the term triangulation refers to the practice of using different sources of data or multiple approaches to analyzing data to enhance the credibility of a research study. Through aligning various perspectives more justification and strength to the outcomes are reached. All of the varieties would be in one study of a single phenomenon to converge on a single construct and can be employed in both quantitative and qualitative studies (Heale & Forbes, 2013). This technique is used to confirm suggested findings or to determine the completeness of data. On the one hand, converging findings aim at raising the validity through verification; complementary results highlight different aspects of the phenomenon or illustrate different phenomenon. On the other hand, divergent results can lead to new and better explanations for the phenomenon under investigation (Flick, 2010). Accordingly, triangulation is considered to promote a more comprehensive understanding of the phenomenon under study and to enhance the rigor of a research study.

Notwithstanding the evident linguistic denotation of triangulation implicates the use of a threefold unit, in social sciences, it refers to the combination of two or more; (1) Data

sources which refer to the integration of diverse data sources. (2) Investigators in which it incorporates two or more expert researchers with varied skills to work on the data. (3) Methods in which the triangulation is similar to a mixed-methods approach where the outcomes of one method are used to reinforce and elucidate the results of the other. (4) Theories that involve the amalgamation of more than one theoretical perspective (Flick, 2010).

- **Data Source Triangulation:** It involves using multiple sources of data in terms of addressing the phenomenon in different spatiotemporal conditions and from distinct people. In the present investigation, data was gathered from different participants at distinct time intervals. For instance, in the pre-experimental phase, data were obtained separately from the control and the experimental groups. Besides, in the post-experimental phase, data were attained from the control and the experimental groups with respect to their numerical estimation of their reduced cognitive load and elaborative comprehension. Consequently, involving viewpoints of a range of participants may reduce the response bias. The two mean scores are crosschecked to examine the efficacy or inefficacy of the treatment. Afterward, quantitative reflections are gathered from the experimental group's participants, and each one of them affords a distinct self-report.
- **Investigator Triangulation:** It involves the collaboration of different experts in the subject matter as an essential strategy to control and reduce the potential bias inherent in employing only one investigator. The assistance rests on a systematic comparison of different researchers' influences on the issue in which they can contribute through reviewing findings. In the current research, the investigator triangulation is beneficially dispatched through the assistance of a panel of adepts in different research procedures. It was exploited in the pilot testing of the tools encompassing the questionnaire. Investigators provided plenty of insights that were compared with the others and ultimately delineated the impetus behind the final draft. It was deemed that a more thorough understanding and valid results are to be gained if several perspectives are considered and deployed throughout the analysis phase.
- **Methodological Triangulation:** It engages multiple methods to study a single problem. It is employed to compare data collected through qualitative methods with quantitative data, therefore, establishing the degree of compatibility between information obtained through different strategies. It forefends the possibility of biases

inherent in one approach by the insertion of other sources of methods. In addition to the fact that the weaknesses of one perspective are overcome by the strengths of the other. The triangulation of methods in the current study is fulfilled the main's share as to the mixed-methods approach that is highlighted earlier.

- **Theoretical Triangulation:** It involves the exploitation of an amalgamation of more than one theoretical perspective. This triangulation is utilized to test a theory, generate one, investigate the research problem, or interpreting the data. Theoretical triangulation is deemed feasible in the current investigation. It is highly ensured through the multifaceted conceptual framework of the present scrutiny. (Norman Denzin, 1970, as cited in Flick, 2010)

2.3 Research Setting

The study was carried out in the department of foreign languages at Si El-Haoues University Center, Barika, Algeria. The instructional sessions of Listening and Speaking module involved in the study extended over a semester of 5 weeks. Workshops took place weekly in the classroom for one hour, guided by the teacher who is at the same time the researcher conducting the present study. It started by the first semester of 2020-2021 and finished at the end of the same semester of the same academic year. The reason behind starting the study early in the first semester is that usually students at the beginning of the academic year will be motivated to learn and engaged in such investigation.

To our full acquaintance, the focus on teaching Listening and Speaking skills has been marginal at Barika University as it is a newly established university center. The oral expression session is the classroom environment where students can have real-life communication in the English language, so teachers should design authentic communicative activities and meaningful tasks that promote oral language learning. Some activities as class discussions, language gales, debates, questioning, presentations, and role plays do support active learning.

Oral Expression module is twofold; firstly, listening comprehension session, which might be regarded as a bridge between the student's academic sphere of English and the other areas of knowledge, as well as between the students' own culture and those of English speaking countries. This will be achieved through purposefully selected videos and records to be discussed. After all, the selected materials are intended to enhance students'

listening skills on which they are going to be tested by the end of each session. Secondly, a speaking session is meant to give students an opportunity to put their linguistic competences into practice. It is also set to improve student's communicative skills through discussions, interactions, and role-play using the right register. Last but not least, the oral expression class aspires to strengthen students' critical thinking by bringing the various contemporary issues and motivating them to pose questions and interact with each other to exchange ideas and experiences. Consequently, the sum of these learning objectives is exploited in the experiment.

2.4 Participants

The population of this research study is first-year EFL students at Si El-Haoues University Center, Barika, Algeria, enrolled in the academic year 2020/2021, and whose number is 101 students divided into two intact groups (group one 50 students, and group two 51 students).

The aim of any oral session for EFL students is to have a good command of the English language, i.e. speaking it accurately, fluently, and appropriately. Furthermore, it is to acquire the ability to communicate successfully and accomplish basic communicative transactions. Moreover, it gives students the chance to express themselves in different authentic conversational situations. In this regard, ICT seems to add value to teaching/learning English and fulfill these goals compared to traditional ways and encourages its integration in educational institutions to line up with 21st century challenges. Responding to learners' needs, therefore, is the teacher's ultimate objective to help his/her students get a step forward to be competitive in a fast-growing globalized world. For instance, activities like listening to a video, a song, or watching a movie or part of a movie can be motivating for learners; hence, the present investigation seeks to reach such an objective. With that being said, the design of a tailored course that meets the curriculum requirements necessitates the provision of subject specialists, domain experts, and authoritative language figures who work hand in hand to cross-check the data and finally to side them with the perception of what is seen as a 21st communicative skill.

The sample under investigation consists of two first-year groups, a total of 101 students in which one forms the experimental group (50) and the other the control group (51). As for the method of selection, the study followed a non-probability sampling in the

form of a convenience selection of participants in which the two groups were selected. The researcher selected participants who are available in well-defined, intact groups that are easily studied.

The rationale behind convenience sampling is that it was difficult for the researcher to apply randomization because of the learners' study schedule which made it hard to randomly create new groups out of the entire population and bring them beyond class time especially in these circumstances of COVID-19. Therefore, it will not only influence their learning but it also makes learners attend the same course twice (as part of their schedule and as participants in the study) as all first-year students follow the same syllabus. Since the study is based on teaching Listening and Speaking courses to EFL students and not teaching specific elements in English, it was suitable to take the two intact groups as they were divided by the administration to create an authentic and natural learning atmosphere.

First-year EFL students were homogeneous groups in terms of age; ranged between seventeen to twenty-six years old with a higher percentage of females. As far as learning is concerned, classes are homogeneous in terms of the level; they follow the same courses as the general characteristics of Algerian universities. They went through relatively the same instructional experiences as far as English learning is concerned; four years in middle school, and three years in secondary school. However, this aspect does not affect their actual perceptions regarding ICT and falls most of the time within more homogeneous trends in terms of preferences, and actual uses.

2.5 Data Collection Instruments

A mixed methodology opted for this research study; thus, several of both qualitative and quantitative instruments have been used with more quantitative weight which would optimally answer the main research questions and confirm or refute the research hypotheses. In the exploratory phase, quantitative insights were planned to be gained from a general linguistic placement test in order to pinpoint the participants' general linguistic English level. Furthermore, a post-test was developed to measure the effect of video-based learning presentations on their cognitive load along with the NASA- TLX rating scale questionnaire. Finally, the investigation was concluded by administrating a questionnaire gauging students' perceptions of integrating video- based learning in developing their English language acquisition. While the scores were collected at the beginning or at the

end of the study period, teacher's reflective journalswere gathered throughout the course of the first semester.

2.5.1 Placement Test

As the forename of the instrument ostensibly denotes, placement tests are instruments designed to assist teachers in placing and positioning students at the correct level regarding certain competencies. The placement test used in the current sphere envisaged the general linguistic competence of EFL students. Accordingly, Pearson Education 2006 provided the basis for the placement test used in the current study. The main purpose of selecting this test was based on the assumption that Pearson Education was abundant in the vicinity of researchers that its validity and reliability could be guaranteed. A fallacy that the researcher took for granted a priori to the administration of the test.

The rationale for choosing this test was accounted for in order to select materials that best suit the participants' proficiency level. In other words, after determining the linguistic level of participants, the researcher may select materials appropriate to the level of students as well as meeting the required criteria. The act of pinpointing the proficiency level of students through the implementation of a standardized valid and reliable placement test was beneficial due to the comparative elements it offered to instantiate a homogeneity/heterogeneity aspect between the control and the experimental groups in accordance with their level of proficiency. Moreover, this process supplied the linguistic threshold within which the post-test was adopted and the golden standard upon which experts' recommendations were sought according to the degree of complexity/easiness encompassed by the text of this test.

Pearson Education placement test has two versions; A and B which can be distributed to students sitting next to each other in order to discourage cheating (see Appendix B). The two versions test the same items and in the same order so that the results can be compared. Furthermore, it embraces one-hundred multiple-choice items; each one of them is accompanied by four options; each item targets either syntactic or lexical knowledge. Moreover, a 45-minute limit should be given to complete the test. This will ensure a more accurate picture of the students' knowledge, yet, if students are given more time, they may become discouraged to change answers they are not sure of.

2.5.2 Post-test

Owing to its multidimensional attributes, cognitive load measurement has long been a complicated chore for researchers. According to F. G. Paas, Van Merriënboer, and Adam (1994), cognitive load can be measured by assessing mental load, mental effort, and performance. Nevertheless, the interrelationships between these three components are not consistent. This inconsistency occurs as students attempt to compensate for an elevated mental load by increasing mental effort in order to perform (F. G. Paas et al., 1994). Cognitive load measurements enable one to speculate an empirical base for how students' cognitive load will be hypothetically impacted by various instructional designs. Thus, measurements of cognitive load can be divided into analytical and empirical methods (F. Paas, Renkl, & Sweller, 2003). F. Paas et al. (2003) believe that analytical methods are considered to estimate mental load without tested or verified empirically. Analytical techniques make use of subjective data such as an expert judgment or analytical data including computer simulations, mathematical models, and task analysis. However, empirical methods are intended to estimate mental effort and performance through utilizing subjective, physiological, and performance-based techniques (F. Paas et al., 2003).

Performance-based measures can be sorted out into primary and secondary tasks. Primary task measurement, on the one side, is centered on performance and would require accuracy scores on assessments of information acquired, usually recall or recognition and transfer tests (F. Paas et al., 2003). On another side, secondary task measurement focuses on performance in a secondary task synchronized to the primary task, i.e. the dual-task method (Brünken, Steinbacher, Plass, & Leutner, 2002). For this thesis, the research objectives target the former sort.

The learning outcomes are the evident intent predictor of the cognitive load level at first glance. The theory of cognitive load forecasts variations in learning outcomes depending on the various amounts of the cognitive load caused by a given circumstance. Consequently, the suggested diversities within the controlled experimental learning situations are traced back to the differences in cognitive load. For years, learning outcomes have been a frequent means of argumentation of cognitive load research. To date, researchers have accredited the significant methodological problems of this method. In support of the previous claim, the experimental covariance of the independent variable

would provide an accurate understanding of the differences that exist within the dependent variables in a perfectly designed experimental procedure.

The different experimental variances, nevertheless, do not always lead to different amounts of cognitive load, sometimes, cause differences in other relevant learning variables, such as motivation and arousal. In the end, learning outcomes are indeed the key variables for measuring the fundamental effect of instruction, and they alone are not valid measures for cognitive load measurement. Together with the test performance, the combination of other cognitive load measures of the mental effort applied by students is the adequate estimator of the effectiveness of the instructional design in reducing cognitive load so that ensuring the underlying theoretical assumptions' validity (Sweller, Van Merrienboer, & Paas, 1998).

In agreement with the nature of quasi-experimental designs as well as the various challenges to their internal validity are concerned, an appropriate aspect that can be supplemented to increase the trustworthiness of the results is through the incorporation of a suitable design that is consistent with the research objectives; namely, the posttest only control group design. The post-test relies on the belief that the dependent variable is measured after the treatment. That is, once each treatment period has been accomplished by the experimental group (after each video presentation), a post-test is administered to both groups in order to determine the effectiveness or ineffectiveness of the manipulation via measuring the degree to which the treatment group improved or not improved in contrast to the control group. As a result, the researcher decided to go behind the post-test only control group design in order to maintain the intact comparability of the difference between the groups' performance on the post-test, thus, the degree of the overall participants' improvement after the treatment can be ascertained.

2.5.2.1 Description of the Post-test

As part of the experiment, following each video presentation intervention, all students in both groups; the experimental group and the control group, were taken post-tests. As it is impossible to measure the cognitive load without information processing as well as its measurement cannot be delayed. The researcher introduces the intervention (video presentation), students will process the instructions, and immediately after that, the researcher measures the cognitive load of students in terms of how they respond to this

presentation; whether their cognitive load increased or decreased. Post-tests were adopted from the British council courses; "Learn English Teens" (https://learnenglishteens.britishcouncil.org/). The British Council is a British organization established by the British government in 1934. It is a cultural institution specialized in international cultural and language educational opportunities. It is nationwide that operates in over 100 countries; fostering a broader knowledge of the United Kingdom and the English language. The British council encourages cultural, scientific, technological, and educational cooperation with the United Kingdom. Learn English Teens is brought to EFL learners by the British Council, the world's English teaching experts. It targets those who want to learn the English language, it is a free website that can help improve learners' English by practicing reading, writing, speaking, and listening. It also offers t ips for exams, grammar and vocabulary exercises, games, and videos. Learners can even interact with others from all around the world. The website as well provides videos accompanied by a set of exercises checking comprehension and understanding. The researcher uses those exercises as posttests that attempt to measure the samples' cognitive load abilities in terms of comprehending the content presented in video lecture materials.

There were a total of six video presentations to be displayed. The choice of the videos from the British council was due to its effectiveness in English teaching and in delivering valid and reliable materials and content. The videos covered various topics; for example, topics about the British culture, famous people and places, sport, study habits, travel, traffic, etc. The selection of these topics over others was based on the learning objectives of the "Listening and Speaking" module set out in the curriculum. The post-tests embrace an adopted set of activities related to each video. The reason for choosing an adopted version of activities is the fact that the validity and reliability of the research instrument are assured. Additionally, the test's activities vary from multiple-choice activities, true/false, yes/no, matching numbers, to gap filling, grouping, and reordering (see appendix E, F, G, H, I, J). It is noteworthy that the post-test administration was just after each video presentation, with the sum of six videos followed by six post-tests. Students had from 10 minutes to 20 minutes to complete the post-tests depending on the number of activities that the post-test has. Therefore, to ensure the accuracy of the results between the experimental and control group, students were allocated the same time to watch the video and perform the post-test that is one hour for both. The following section will describe each posttest construction:

The First post-test "Can and will: Gwyn Haslock"; consists of two activities; the first one is to match the vocabulary with the correct definition, including eight items. The second activity is multiple-choices and includes eight items as well (see appendix E). The time allotted to complete this posttest is ten minutes.

The Second post-test "The BFG – official trailer"; the first activity is to correctly match the vocabulary with its definition, consisting of eight items. The second activity is to decide about eight sentences whether true or false (see appendix F). It took ten minutes to accomplish this post-test.

The Third post-test "Windsor Castle"; takes twenty minutes to complete this post-test. The first activity was about aligning the vocabulary with the correct definition of eight items; yet, the second activity is multiple-choices that contain six items. The following activity is a yes/no activity which consists of eight items. The last activity is matching and it includes eight items as well (see appendix G).

The Fourth post-test "Yusra Mardini, a young refugee"; like the previous tests, this post-test starts with matching vocabulary with the correct definition, consisting of eight items. The subsequent activity comprises eight multiple-choices items (see appendix H). This post-test longs for ten minutes.

The Fifth post-test "International Women's Day – We are women"; as all post-tests, it begins with ten vocabulary items that need to be matched with their definitions. Then, the next activity is to fill the gap of eight sentences. The last activity is to classify fifteen words in a table subsequent to its group function (see appendix I). This posttest took fifteen minutes to be completed.

The Sixth post-test "Time Out London: Routemaster"; starts by matching the vocabulary with the correct definition of eight items. Then, the next activity is to decide around eight items that true or false. The corresponding activity is to identify as well about eight items whether yes or no. The final activity is to fill the gaps of five sentences as well (see appendix J). This post-test was extended for twenty minutes.

2.5.2.2.Post-test Scoring Scale

As it was not available on the same website of the British council, the researcher herself developed a scoring rubric. The scoring was out of twenty in which the distribution of marks was based on the number of activities as well the number of items in each activity; refer to Appendix F to check the scoring of each posttest. In the current investigation, since the test is standardized so the test validity and reliability are indisputable.

2.5.3 NASA-TLX Questionnaire

The most common way of measurement used by researchers in cognitive load theory is the use of subjective self-reported rating scales for the assessment of perceived mental effort, task difficulty or engagement (F. Paas et al., 2003). Learners are asked to rate their perceived cognitive load with items on a semantically differential scale. The scale process is based on the assumption that learners can make a reliable and valid estimation of the amount of load they were confronted within a particular situation (F. Paas et al., 2003). Learners in general report different amounts of the perceived load depending on different instructional designs of learning materials. Rating scales have been found to be sensitive to relatively small differences in cognitive load and that learners are indeed capable of assigning numerical values, with relative ease and accuracy, to the imposed mental load or mental effort invested (F. G. Paas et al., 1994).

A widely used subjective rating scale for fast and easy assessment to perceived cognitive load is the NASA Task Load Index. The researcher used the standardized version of Hart and Staveland (1988) cognitive load instrument. It was developed by the Human Performance Group at NASA Ames Research Center during three-year research. The NASA Task Load Index is a multi-dimensional rating procedure that provides an overall workload score based on a weighted average of ratings on six subscales: mental demands, physical demands, temporal demands, own performance, effort, and frustration (Appendix K). Learners are asked to answer questions about the mental efforts they exerted in a specific situation. This assessment is done with students in the experimental and control group subsequent to the intervention, that is, once the treatment period and regular instructions were finished with the experimental and control group. The choice of timing was due to the effect of timing for cognitive load ratings; with delayed ratings of mental

effort and task difficulty indicating higher cognitive load than immediate ratings (Schmeck, Opfermann, Van Gog, Paas, & Leutner, 2015).

This self-reported instrument was chosen as it is currently the only quantitative instrument to measure all three cognitive loads. There were a total of six dimensions; three dimensions relate to the demands imposed on the subject (mental, physical, and temporal demands) and three to the interaction of a subject with the task (effort, frustration, and performance). A definition of each subscale is provided in (Appendix L). Each subscale comprised of an item in the interrogative form asking participants for an indication of their mental effort during a learning task. The scores were based on a seven-point Likert scale and ranged from (1) very low to (7) very high (See Appendix E). Scores on the low end of the scale indicated students experienced a low amount of cognitive load when viewing the material. Though, scores on the high end of the scale indicated students experienced a high amount of cognitive load type when viewing the material. Once students viewed each of the six video presentations or taught through lecturing, they completed the NASA-TLX questionnaire.

The reason behind using the subjective self-reporting rating scale is that each type of measurement; objective or subjective, direct or indirect, alone has its drawbacks. There is a need to complement each method with additional method especially concerning a continuous measurement of cognitive load during the learning process. Combined measures of cognitive load calculate efficiency measures for the learning process (F. Paas et al., 2003; F. G. Paas & Van Merriënboer, 1993). The approach can be used to model the efficiency of learning performance as a function of mental effort and learning performance. The values of the mental effort ratings and the learning performance are transformed to a comparable scale.

2.5.4 Post-Treatment Questionnaire

The second research question is about the influence of the treatment on the students' attitudes and perceptions. The researcher sought to answer this research question through a questionnaire. The reason for administering the questionnaire was to gauge students' perceptions about the integration of video-based learning presentations in reducing their cognitive load and to what extent that integration was successful and effective. The post-test only design was chosen as a research tool helping to identify any changes in the

students' cognitive load perceived from the position of the rater. However, the measurement of the rater is not sufficient to have a holistic representation of the students' cognitive load. Consequently, it is essential to examine whether the reduction in the cognitive load, if any, is due to the use of video-based learning presentations that lead to better language acquisition.

Though the questionnaire reliability and validity are questioned by researchers, the researcher sought to use it in this study as it provides different benefits that can serve the objectives of this research. One of the advantages of the use of the questionnaire is that it enables the researcher to collect a huge amount of data in a short time alongside with the rapid processing of data. Besides that, the questionnaire yields increased consistency and reliability of the results as they decrease the researcher bias. The questionnaire was self-designed by the researcher on the basis of the research objectives and research questions. The items included in the questionnaire were mostly based and inspired from the insights that the review of literature offered to fit into the purposes of the current study. The information that sought to obtain through the questionnaire required the choice of close-ended questions, first, to facilitate for students answering the questions and then, to facilitate for the teacher the coding and analysis of responses.

The questionnaire was created for the study with an intentional focus on the research questions identified previously. It was administered to the participants of the experimental group at the end of the study; that is, once the treatment period was finished with the experimental group in which participants were required to respond to each question according to their own feelings. First of all, depending on the aim of the question the questionnaire was entitled; it started with an opening greeting and an introduction explaining to the participants the purpose of study. Then, the participants were requested to answer as honestly as possible, ensured about the anonymity of their responses, and asserted that their responses will be used only for research purposes. Finally, the participants were thanked for their participation and valuable time. The questionnaire items were in the affirmative declarative form alongside with simple, direct and comprehensible wording to obtain reliable and valid measures.

The questionnaire comprised thirty-seven items covered three major areas related to the use of video-based learning presentations and its effect on the cognitive load in addition to the background information section (see appendix N). Starting by the

background information, this part of the questionnaire composed of six multiple-choice questions which ask students about their gender, years of studying English in university, whether they watch videos, what kind (s) of videos they watch, whether they used to be taught through videos and if they enjoy learning through videos. The background information part was done to ensure that the sample selected is homogeneous, share the same characteristics in terms of age, educational background, English learning experience, etc; accordingly, they can be representative of the population of the study. Doing so would contribute to the internal validity of the study and enable the duplicability of the results.

For the three sections of the questionnaire, a five Likert scale was adopted, in which participants have to choose one response from the following scale ranging from negative to positive; strongly disagree, disagree, uncertain, agree, and strongly agree. The 5 Likert-scale was used as it is simple, flexible, and reliable. These variables were included with an attempt to regard different levels of approving or disapproving and to make items easy to interpret. Hence, students rank their degree of agreement or disagreement with the statements.

The first section included thirteen items that explored students' perceptions of watching educational videos. The first seven questions were about students' opinions on the nature and structure of the watched videos. Furthermore, the next six items were about students' perceptions of the effect of educational videos on English learning. The second section was about the students' attitudes towards videos-based learning and lecturing. This section contained eight items. The purpose of this section was to find out whether students prefer learning English through educational videos or lecturing. The third section consisted of ten items about students' perceptions of their cognitive load during watching educational videos.

2.5.4.1 Questionnaire Validity

Due to the lack of an available valid and reliable test that assembles the basic requirements upon which the current questionnaire is raised, the questionnaire was self-developed by the researcher. Therefore, its validity would be questioned. Within the peripheries of this sphere, according to Lodico et al., (2006) validity is about the degree to which a specific instrument measures what it is intended to measure. Consequently, the construct validity of the test is the most targeted because it "involves a search for evidence

that an instrument is accurately measuring an abstract trait or ability." (ibid. p. 94). With that said, validity is the inclination towards how well a given measurement test matches the theoretical context in which it is embedded (Fraenkel, Wallen, & Hyun, 1993). It colligates, in particular, whether the questions in the Likert scale reflects the perceptions of EFL students of video-based learning. Presumably, the adoption and adaptation of an instrument developed by previous researchers and scholars guarantees and increases the validity of the measurement. The act of dispatching a rigorous and thorough instrument in the present research will assertively depend on the pilot testing of the instrument with experts who will afford a robust line of thought.

2.5.4.2 Questionnaire Reliability

Reliability refers to the consistency of scores, echoing Lodico et al.(2006), reliability is the ability of an instrument to make approximately the same scores for an individual via repeated testing or through dissimilar assessors. It aims at ascertaining the consistency of scores taken by the same participants by comparing the first and the second performances. Reliability was defined by Fraenkel et al. (1993) as the degree to which test scores are consistent over repeated trials and across distinct raters. This assertion means that reliability is the process of maintaining the stability of scores over time regardless of how often the instrument is repeated and no matter by whom it is rated. A test-retest procedure was followed in an endeavor to safeguard the scale reliability in this study. It is destined towards determining the consistency of scores that the same respondents obtained while analogizing their first and second performances.

The expedient description of this reliability proceeded through the selection of a volunteered pilot sample consisting of five first-year EFL students of Si El-Haoues University Center of Barika of the academic year 2019/2020 to whom the test was administered twice with a temporal interval of 20 days. Subsequently, by means of the consistency test, the stability of these respondents' scores over time was statistically measured. It is justified to state at this stage that students' questionnaire has achieved high level of reliability which have been verified by Cronbach Alpha statistical calculations 0.896 which was measured through the consistency test computed via the SPSS.

2.5.4.3 Pilot Testing the Questionnaire

Pilot testing is one of the main procedures that increase the validity of the research findings and the credibility of the implicated conclusions. According to Gliner, Morgan, and Leech (2011), pilot testing involves examining the research tools in the ultimate quest to adjust them with either experts in the field or subjects whose characteristics are equivalent to those of the target population. Piloting in this study includes one main instrument; the piloting of the questionnaire. The other instruments; the placement test; post-test and the NASA TLX questionnaire are not pilot tested as they are standardized tools so their validity and reliability were not questioned. McCormack, Hill, and Hill (1997), subsequently, claim that the intent of piloting tools is to scrutinize their effectiveness on a selected sample from the potential participants.

The piloting of the questionnaire was carried out to ensure the validity and reliability of the instrument. As stated by Lancaster, Dodd, and Williamson (2004), pilot testing is conducted to spot potential problem areas and deficiencies in the research instruments and protocol prior to implementation during the study. This would be through polishing the questionnaire with experts in the subject under investigation and members of the target population. That is to say, the data gathered while pilot testing instruments are utilized to improve and refine the data gathering instruments. Prior being distributed to participants, it was a necessary task to pilot test the students' perception questionnaire.

The questionnaire was given a try-out for the ultimate fine-tuning, first; four teachers in the Department of English Language and Literature were consulted to be indulged in the process of pilot testing in late April, 2020 (Appendix M). After some recommendations provided by experts, the questionnaire was conducted with five students from the population but out of the sample. These students share almost the same characteristics with the sample of the study in terms of age, educational background, and English instruction experience. This permitted the researcher to take direct feedback about the problematic points in the questionnaire. After the pilot testing with the experts and the members of the target population, the feedback resulted in the refinement of the Likert scale questionnaire in accordance with their comments. First, the time needed to answer the questionnaires was very close between the four participants ranging between 15 to 20 minutes. This suggests that the time allocated by the researcher to finish the questionnaires was well founded and well suited. As for the clarity of instructions, the participants reported to be clear.

Nevertheless, the wording of the questions was clear with some ambiguities in the meaning of few words, resulting in some modifications of the questions wording. In addition, the researcher discarded two questions from the third section of the questionnaire as they were irrelevant and did not provide useful data and one repeated question was omitted because it was redundant and, thus, yielded similar answers by the participants. In agreement with the aforesaid adjustments and recommendations, the researcher wrote the final version in light of these changes which was then ready to be administered to the participants in experimental group of the study (Appendix N).

2.5.5 Reflective Journals

The use of journals is a well-documented method for the provision of key data in qualitative research; therefore, journals employed in this study became a crucial tool for an exploration of the surrounding issue by providing a rich and in-depth description. Under the umbrella of personal document research; qualitative methods make use of a range of data collection methods. Personal documents, for instance, can include autobiographies, diaries, letters, journals, oral histories, or other raw materials authored by a single person (Holbrook, 1995). Verbrugge (1980) journaling was first described as a primary source of data collection; yet, Smith and Hunt (1997) noted later that journaling is used least frequently in phenomenological research for data collection, but that it is still a valuable instrument for documenting specific experiences and feelings associated with them. Since data collected from journaling can be used to successfully examine specific experiences in natural contexts and frameworks, the deployment of journals in the current investigation was intended to add rigor to the qualitative inquiry as the researcher was able to record their reactions, assumptions, expectations, and feelings about the experience in the teaching practicum.

Reflective journals are an interesting research tool that can be employed in social research to collect information about a particular topic and explore the complexities of human behaviors and practices. The terms journal, log, and diary are used interchangeably. Nonetheless, there are some minor distinctions. A log is an objective report of specific incidents; whereas a diary is a continuous, unstructured, and private record that contains thoughts and feelings (Hedlund et al 1989). In the sense that it combines personal reflections, accounts of events, and descriptions of experiences, a journal is both a diary

and a log (Chabon & Lee-Wilkerson, 2006). This collection of data uses a longitudinal study ranging from several days to few months. In educational contexts, according to Nunan and Bailey (2009), written journals or diaries are widely used in second language teaching research as a way to access teachers' and students' introspections about classroom practices in order to gain insights into how they behave to make meaning from the challenging situations they face.

Reflective journals have different purposes; first, they allow teachers to document and reflect on their language learning process and teaching methods and experiences as a way of thinking, understanding, and learning. Moreover, they help to establish links between theory and practice in the learning and teaching of second languages, furthermore, permits teachers to make changes in their teaching methods (Van Horn & Freed, 2008). This research study, hence, attempts to explore such a possibility; the use of journaling as a qualitative research tool for exploring teacher's perceptions towards the use of video-based learning presentations and its effect on cognitive load. Through recording teachers' internal thought processes during the treatment, they revealed how they use, perceive and react towards video-based learning, and what kind of problems, advantages, strengths, and weaknesses existed.

Journaling as part of the research can be used in two ways; first, as a means of documenting and reflecting on the practice of research (Banks-Wallace, 2008); second, as a data-gathering tool that records information for later analysis (Välimäki, Vehviläinen-Julkunen, & Pietilä, 2007). According to Välimäki et al. (2007) journals can be used as primary sources of data in research; still, Swenson (2004) argued that journaling as a data collection instrument can be paired with other data collection methods to enrich information gathered from interviews. Consequently, teacher's reflective journals were selected as one of the research instruments for this study due to its potential as a tool for exploring teachers' reflective thinking in which the researcher has to journal her reflections, behaviors, thoughts, and feelings immediately after each observed lesson thereby minimizing the probability for post explanation; determining the antecedents, correlations, and consequences of daily experiences and behaviors. As a result, journaling had dual purposes; providing a space for teacher reflection and capturing it for exploration.

Crosbie (2006) asserts that diaries or journaling are most effective when used in a combination with other research tools within a mixed-method approach. That is to say,

they are used to triangulate claims made by respondents in different data sources and provide more richness and details about a certain topic. In this case, journaling is used to fill the gaps where the quantitative findings are missed. This idea of integrating the use of journals alongside other tools can be viewed as a strategy for gaining a variety of perceptions, leading to deeper understanding and knowledge of the issue under study (Flick, 2010). Reflective journals also give more validity and credibility to the data as it acts as a mediator; the construction of research knowledge.

Journals indeed provide thick and deep descriptions of the researcher's perceptions, yet she is vulnerable to the threat of bias. To overcome this problem, the journal's writing should be structured. A set of guidelines and instructions on what should be included and focused on were designed to help the researcher focus her thoughts on particular aspects of the concept. That is to say, reflective journals have a format that has spaces for noting pre-specified aspects of interactions. The semi-structured format is considered to reduce the potential for bias from the researcher's own opinions of what is important about their observations (reflective journals' checklist) (see appendix O). Through this approach, researchers may still be participants but their participation is likely to be more superficial. They should strive to sustain a neutral and non-judgmental effect and remain aware of the way their effect may shape their interactions, the responses and behaviors of those being studied, and their own interpretations and sensitivities in translating observations to field notes. It is useful to review each set of observations and notes in order to fill in any gaps and to identify any problems or changes required to the research procedure as it is important to provide guidelines for data handling and management.

2.6 Data Collection Procedures

Managing the research instruments entails a tangible interactional network between the researcher and the participants involved in the research study. The tools pertinent to this probe are run chronologically as follows:

2.6.1 Placement Test

The placement test was conducted on the 22rd of December 2020 at 8:00 am with the experimental group and at 9:00 am with the control group, with an allotted time of 45 minutes in the classroom of the research sample. This was the first examination the

researcher handed with the sample. The researcher clarifies the purpose of the test prior to its performance; which is to unveil their general linguistic competence.

2.6.2 Post-test

The post-test was used to measure learners' understanding and retention with regard to the course content in both the video-based and the traditional text-based instruction within a temporal span of 1 hour in the research sample's classroom under the auspices of the teacher of the listening and speaking module; the researcher herself. In the first session, the researcher explained the reason behind the test in terms of measuring the amount of their progress. Furthermore, she ensured the participants' anonymity regarding their written responses. Moreover, group two represented the experimental group, while group one represented the control group. Both groups had the same course content; yet, each group had different learning instructions. Participants, thereby, underwent the post-tests separately with the researcher's insistence over the individual work.

Since there were six video-based lectures, six different post-tests were performed in relation to the course content. With an overall dissimilar structure, post-tests were distributed in each session during the intervention period. The first post-test was handed out on the 29th of December 2020 at 8:00 am with the experimental group and at 9:00 am with the control group. The second post-test was conducted on the 5th of January 2021 at 8:00 am with the experimental group and with the control group at 9:00 am. The third one was administrated on the 6th of January 2021 at the same time for both groups. The fourth and fifth post-tests were delivered on the 7th and 13th of January 2021 respectively; for each group the same timing was handed. As for the last post-test, it was distributed on the 14th of January 2012 at 8:00 am for the experimental group and at 9:00 am for the control group.

2.6.3 NASA-TLX Questionnaires

These questionnaires are paper-based post reflection surveys. With an overall similar structure, they were distributed at the beginning along with the post-test of each lecture and performed at the end after each post-test with both groups; the experimental and control. It was held on the 29th of December 2020, 5th, 6th, 7th, 13th, and 14th of January 2021. Within a time span of 10 minutes, participants were allocated to the NASA-TLX questionnaires at

the end of the session. The researcher explained the procedures for the accomplishment of these questionnaires beforehand on the 24th of January 2021; she asked them to tick in the box that best closely fits their response that represents the state of their cognitive load. Further, she explained the six rating scale definitions in details (see appendix L). The researcher informed the participants that there are no correct or wrong answers while stressing their sincerity in answering the questions. Accordingly, the administration completed with no vacant boxes or blank questionnaires.

2.6.4 Post-Treatment Questionnaire

As regard the administration of the questionnaire, it was realized as the final stage of the inquiry phase in order to shed light on some aspects that were noticed during journaling. The questionnaire asked for learners' perception of video-based learning experiences they had which was held at the end of the semester. The questionnaire was undertaken by participants of the experimental group only on the 14th of January 2021 at 10:00 am; the same day as the last post-test administration, it was returned the same day. All participants of the experimental group were present in the same classroom. Prior starting answering the questionnaire's questions, the researcher briefly explains the purpose of the questionnaire. Participants were asked to put a tick in the box which corresponds most accurately to the response that describes them and highlighting their honesty in answering the questions.

The researcher was present during the process to answer any questions, clarify any ambiguities on the one hand, and ensure that all the questionnaires were returned, on the other hand. Dörnyei and Taguchi (2009) emphasize that there are more possibilities to recuperate all of the questionnaires that were handed and group-administered than those which are mailed. More particularly, they further asserted that group administration of the questionnaire is the best option, mainly when the participants are language learners within educational settings, as is the case in the current probe. Participants took their time to answer the questions and were not pressed to answer or to finish within a defined time frame. Even so, it took all participants 15 minutes to complete the questions. The administration of the scale ended with no vacant boxes or blank questionnaires.

2.6.5 Reflective Journals

The use of this research instrument was pivotal for the researcher to track students while they progressed through the experimental procedures. That is, the researcher herself inscribe journals all along the intervention period starting from the first session of the semester on the 15th of December 2020 and concluding with the last session of the semester the 14th of January 2021. These reflective journals were at the researcher's disposal once the examination period came to an end. The researcher attempts to reflect upon the learning situation to describe the views, reactions, feelings, and expectations of participants throughout the teaching experience (see appendix O).

2.7 Materials Used in the Study

In this research different materials were adapted and adopted to achieve divergent objectives which are to be portrayed.

2.7.1 Description of the Video Materials

Throughout the semester of the treatment, seven video presentations were used; one in a pilot session and six videos in the treatment phase, each focusing on a topic that was part of the semester's curriculum. The researcher selected adapted video presentations from British Council Learn English Teens. The videos were in MP4 format; this is the high-quality video creation format that most devices can access. The videos are installed so that eliminating Internet connectivity problems at the critical moment of the video start. In each session, the researcher delivered the lectures using an overhead projector with loudspeakers for sound display. Moreover, a printed copy in A4 format of the post-test and NASA-TLX questionnaire were furnished to each of the participants in the experimental group and the control group. Their answers and responses were written down on the same sheets. The researcher is well versed in computer usage and basic skills of using devices (overhead projector, loudspeakers, and laptop). Accordingly, the instructors' technical competence attests to the seamless integration that maintained students' attention as well as avoided discontent.

The video materials are designed based on Mayer's nine criteria of Cognitive Load Theory of Multimedia Learning (CLTML) (Mayer & Moreno, 2003), which were discussed in chapter one. For the off-loading criteria, audiovisual multimedia types contain information presented in the audio with minimal text. As for the segmenting criteria, students were in control of the video's pace. For the pre-training criteria, the instructor introduced a warm-up activity prior to the display of the video presentation. As for the weeding criteria, there were no unrelated graphics. For the signaling effect criteria, each important piece of information from a scene contained headings for the content under discussion. For the aligning and synchronizing criteria, each type of video multimedia; the presentation of the narration and the placement of the printed words, and graphics were all in the same scene. For the eliminating redundancy criteria, in the video multimedia type, the printed words featured spoken information, thus were not redundant. Lastly, for the individualizing criteria, placement test and t-test tests were administered to assess students' prior knowledge.

By considering Mayer's nine CLTML criteria, the germane cognitive load enhances learning by having students devote more cognitive resources to tasks relevant to schema acquisition through increased effort or motivation (Mayer & Moreno, 2003). With that being said, watching videos will provide opportunities for students to construct their own understanding and apply what they have seen by having them explore, manipulate, process, and test the skills demonstrated in the videos.

2.7.2 Length of the Video Materials

For practical reasons, all the video segments were composed by the researcher provided that a number of conditions should be taken into account when selecting the materials. For one reason, the video length had to be convenient for the duration of the instructional session. A long video, for example, would take much time to watch and would disrupt the attention of the students to the targeted items, and thereby fail to achieve the objective from the activity. Therefore, each video lecture session lasted for an hour which each video presentation lasted for approximately two to four minutes. It was decided to watch the video segment only once; however, based on the feedback obtained from the pilot study, participants requested a second opportunity to watch the video in order to

capture more specific details. Thus, the instructor settles on two views to the video segment.

The video segments were of varying length depending on the individual video material. The length of the video lecture not only included the time taken to show each of these multimedia video presentations, but also the time allowed for post-test questions taking. The maximum amount of time students had to complete post-test questions was fixed; i.e. five minutes per exercise for a total of four exercises or twenty minutes. Consequently, the length of time for each video lecture was similar across the multimedia groups but varied across video segment materials as illustrated in **Table 2.1**.

Table 2.1

Video Materials Description

Lecture	Title of the Video	Time of the Video	Number of the Activities	Time Allocated for the Activities	Total Amount of the Video Lecture
Pilot Study	How can more women get into politics?	2 minutes and 28 seconds	Three	15 minutes	1 hour
First Lecture	Can and will: Gwyn Haslock	3 minutes and 19 seconds	Two	10 minutes	1 hour
Second Lecture	The BFG – official trailer	2 minutes and 5 seconds	Two	10 minutes	1 hour
Third Lecture	Windsor Castle	3 minutes and 32 seconds	Four	20 minutes	1 hour
Forth Lecture	Yusra Mardini, a young refugee	2 minutes and 1 second	Two	10 minutes	1 hour
Fifth Lecture	International Women's Day – We are women	2 minutes and 37 seconds	Three	15 minutes	1 hour
Sixth Lecture	Time Out London: Routemaster	2 minutes and 38 seconds	Four	20 minutes	1 hour

2.7.3 Content of the Video Materials

The researcher used professionally produced videos about merging topics that were employed from the British council learn English teens in conducting the experiment. It is part of the Video Zone; an educational video series that provides videos along with exercises, transcripts, and worksheets to help learners understand; thus, improving their English level. The complete series comprise 136 videos, with 7 video exploited in the study (including the video of pilot study). The selection of topics is a further element determining the video characteristics. That is, each video revolves around a particular theme. International Women's Day – We are women, Time Out London: Routemaster, The BFG – official trailer, and Yusra Mardini, a young refugee are examples of the selected topics that were believed to raise the interest of the participants. Moreover, on the basis of the high ratings and good comments received from viewers, these videos were selected.

As mentioned above, in each video presentation the emphasis was on one aspect set in the curriculum; for example, listening to job descriptions, traffic, famous places, famous people, exceptional people, etc. Thus, video presentations were carried out on one target feature, each time, to avoid overwhelming the students and promote the process of vocabulary acquisition to the targeted feature. It was hence important to limit the number of targeted features and choose among the myriad of features involved in the listening and speaking course those that help attain the objectives of the research. Furthermore, the spoken language in the videos was authentic and unedited. The vocabulary used in the videos was simpler since the results of the placement test indicated that the level of students was intermediate, so the choice of the videos was based on those results. Additionally, the video segments were delivered through interviews between an interviewer, reporter, interviewees, etc. There was a high audiovisual correspondence; that is, videos not only consisted of talking heads rather there were constant visual clues, such as notes, written signs, facial expressions, gestures, and body language to convey meaning.

- **The pilot Study Video Material**

How can more women get into politics?

The pilot test video was about politics, particularly about how some countries have tried to get more women involved. The video was an extract from BBC; the reporter

divided the report into three parts. Step one: you have got to turn up. She discussed how women were shut out with no say for years and how they do get a fair chance to vote and then to be elected as members of parliament than ever before. Step two: Take inspiration from role models. She gave the example of New Zealand as the first country to give women the right to vote, and the first country that elected women as a world leader. The final step: Targets can help; the reporter talked about women's equality and provided the instance of Rwanda. The learning objective of this video lecture material is to talk about past events using chronological sequence (s) and appropriate sentence linkers as well as to understand the content, identifying major items, transferring nonverbal information into verbal information. An example of a screenshot of the video is shown in ***Figure 2.1***.

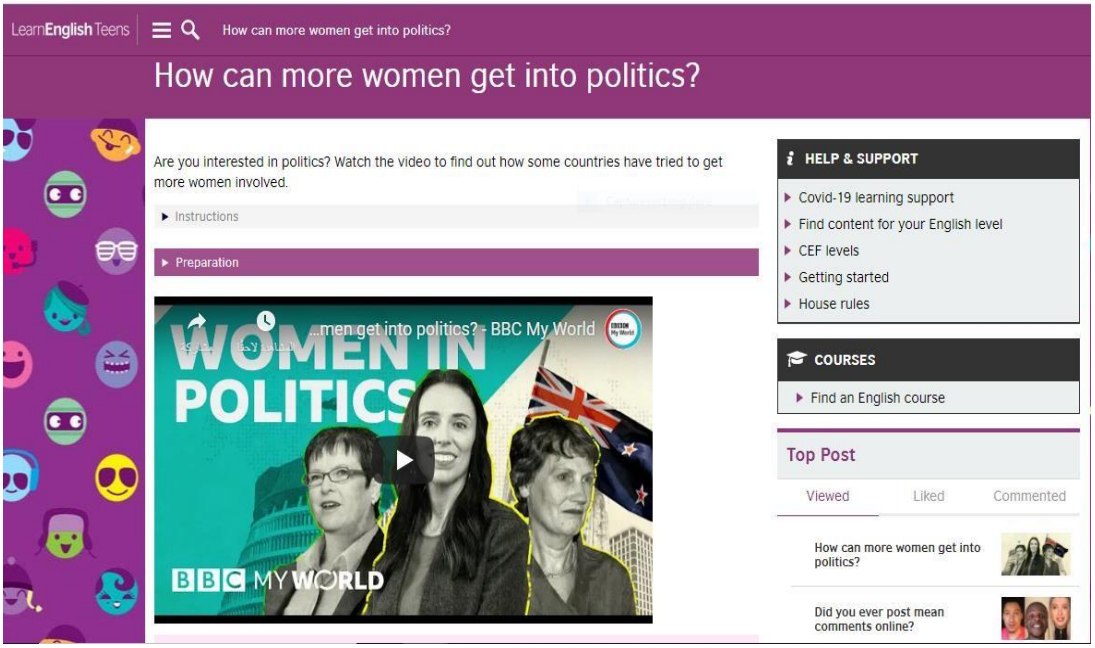

Figure 2.1 **Screenshot of the Video Used in the Pilot study**

- **The First Video Material**

Can and will: Gwyn Haslock

The video was about the story of a surfer called Gwyn Haslock who has been catching waves for over 60 years. The video segment reflects on how she started, surfing then and now, and why she loves it. Gwyn was encouraged by her father and she first started in about the 1950s. Then in 1967 had a competition and was the first ladies' British Champion. Over 60 years after getting her first board, Gwyn still surfs; Can and will Surf

forever. An example of a screenshot of the video is shown in ***Figure 2.2***. The learning objective of this video lecture material is to talk about famous people, making suggestions about their lives, understanding implicit facts, and describing people; (their physical appearance, daily activities, likes, and dislikes).

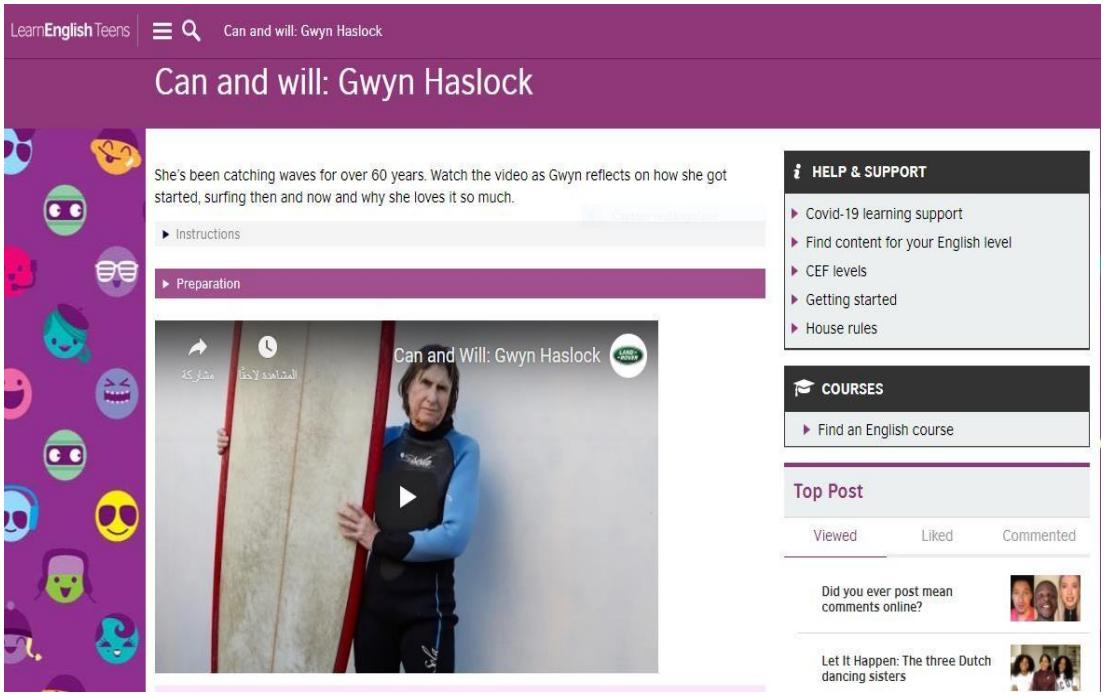

Figure 2.2 **Screenshot of the Video Used in the First Session**

- **The Second Video Material**

The BFG – official trailer

The BFG (The Big Friendly Giant) is a book by one of the UK's favorite authors Roald Dahl. This video segment is a trailer for an adventure film. It tells the story of a little girl called Sophie who thinks that the giant is a monster. However, it turns to protect her from the other bad giants who tried to eat her. Therefore she named him the Big Friendly Giant. An example of a screenshot of the video is shown in ***Figure 2.3***. The learning objective of this video lecture material is to promote the realization of the requirement of a communicative technique to present the process of language-mastering by comprehension of live culture speaking another language.

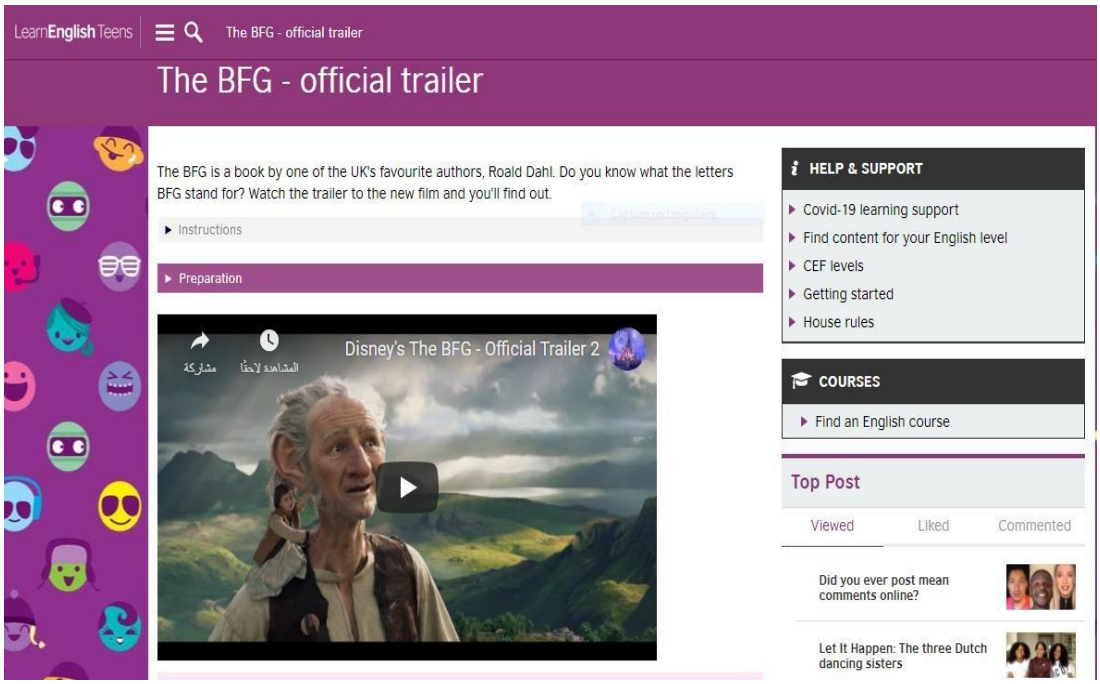

Figure 2.3 **Screenshot of the Video Used in the Second Session**

- **The Third Video Material**

Windsor Castle

This video segment describes the fascinating and historic building “Windsor Castle”. It is the longest continually inhabited castle in the world, the official residence of the Queen, and the destination of a million visitors each year. This symbol of the British monarchy was built by William the Conqueror in the 11th century. As a national monument, Windsor Castle tells the story of a thousand years of British royal history like nowhere else and is enjoyed by visitors from all over the world. The learning objectives of this video segment are to account for famous places, understanding specific information, discussing value/historical importance, and listening to a description of a place to understand major details and use deictic words to describe places. ***Figure 2.4*** shows an example of a screenshot of the video.

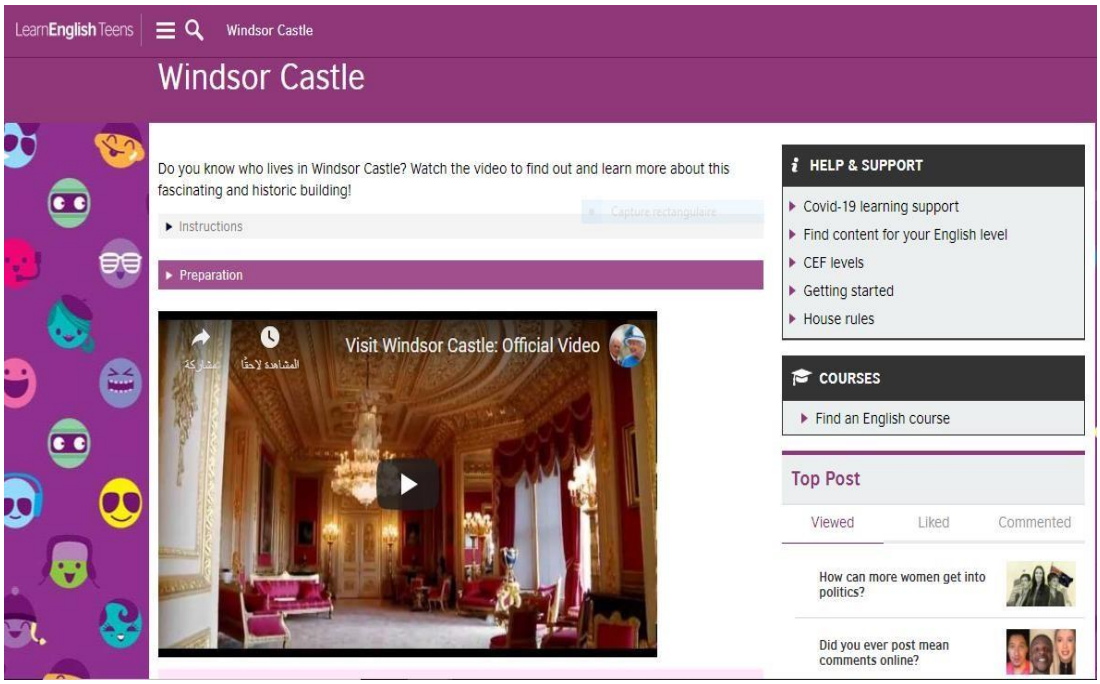

Figure 2.4 **Screenshot of the Video Used in the Third Session**

- **The Fourth Video Material**

Yusra Mardini, a young refugee

The current video segment discussed the incredible story life of a Syrian swimmer who competed in the Olympic Games in Rio de Janeiro "Yusra Mardini". In the video, Yusra tells her story; she has her family and friends, and she loves to go to the pool in her hometown in Syria. Then the war came and everything changed; hence, she escaped Syria to settle in Turkey then in Germany where she becomes a refugee. She went back practicing and her coach helped her to achieve her dream to swim at the Olympics. ***Figure 2.5*** illustrates a screenshot from the video. The learning objectives of this video segment are to talk about personal plans, to listen to a theme, and infer meaning.

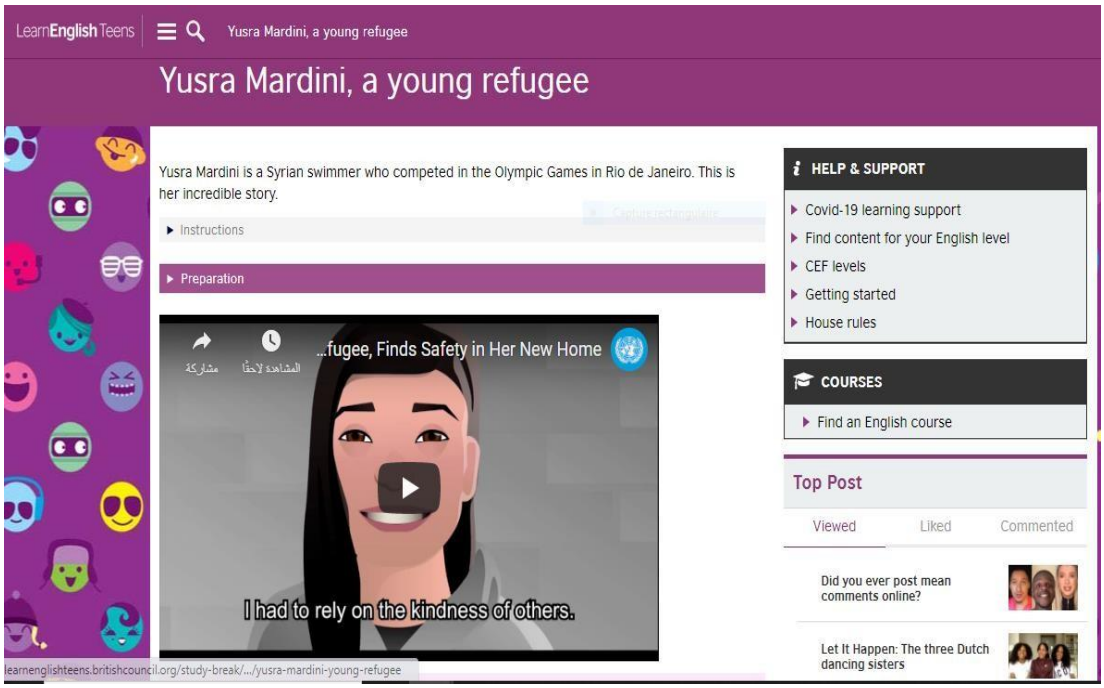

Figure 2.5 **Screenshot of the Video Used in the Fourth Session**

- **The Fifth Video Material**

International Women's Day – We are women

This video segment is about International Women's Day, 8 March, which is a day to celebrate women and their achievements. This video shows lots of things that women can be and do. For instance, they can be daughters, mothers, sisters, wives, and soulmates. Furthermore, they can be bosses, leaders, teachers, doctors, and lawyers. Also, they can be scientists, musicians, engineers, and athletes. The learning objectives of this video segment are to practice turn-taking and talk about people and their lives. ***Figure 2.6*** demonstrates a screenshot from the video.

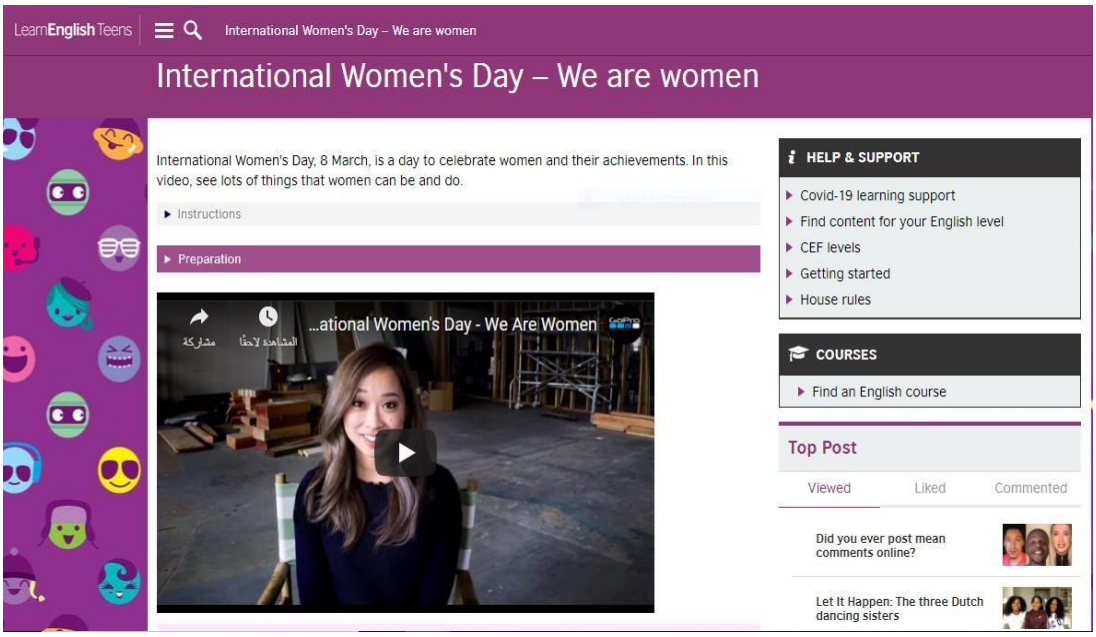

Figure 2.6 **Screenshot of the Video Used in the Fifth Session**

- **The Sixth Video Material**

Time Out London: Routemaster

The last video segment tackles a new type of London's famous red double-decker buses called the "Routemaster". It was an extract from real-life communication; how a girl called Sonya wants to try this new bus. Therefore, there is a communication between the girl, the announcer, an interviewer, and the men in the bus. Sonya shared her experience which claimed that it is the most overhyped piece of transport she has ever been on. An instance of a screenshot of the video is shown in ***Figure 2.7***. The learning objectives of this segment are listening to means of travel, understanding differences, talking about advantages and disadvantages.

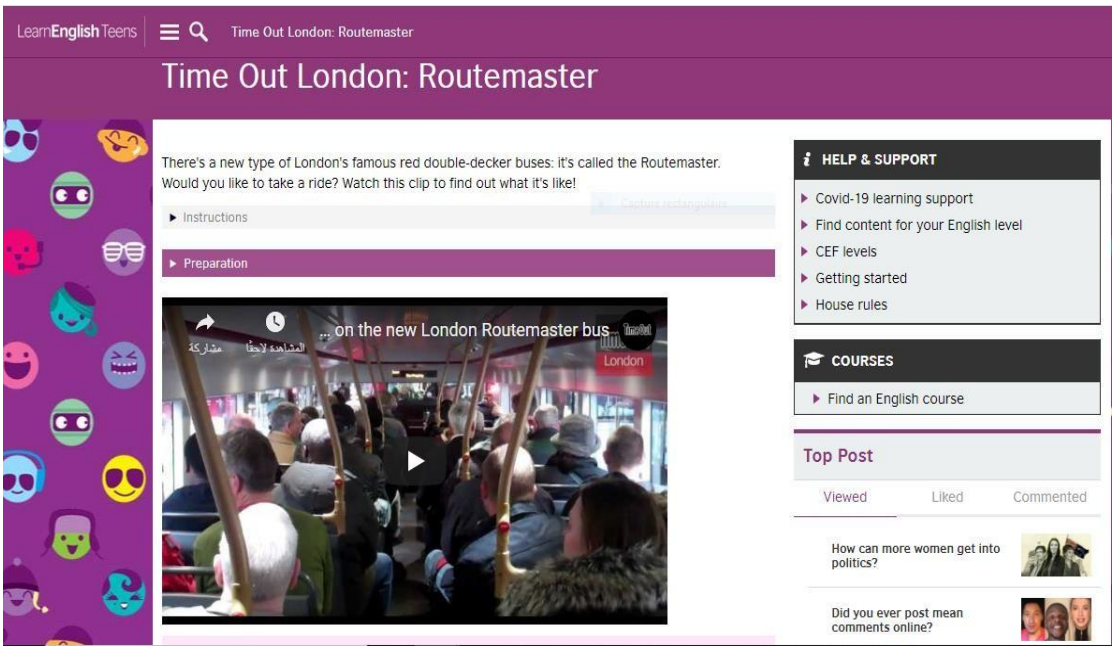

Figure 2.7 **Screenshot of the Video Used in the Sixth Session**

2.8 The Experimental Experience

As mentioned earlier, the major aim of this research is to investigate the effects of video-based learning on first-year LMD students' cognitive load. During the preliminary phase of the current research, the research problem was confined and research questions and hypotheses were formulated. The subsequent phase comprised the fieldwork embracing preparation and organization of the experiment to be conducted. Over and above, the methodological framework that this research adopted at the outset is fundamentally experimental via the integration of video presentations in the ultimate quest to reduce the participants' cognitive overload. Initially, the researcher desired to embark upon generalizable true experimentation through the randomization of the sample selection and the sample assignment respectively. Nonetheless, this was not the case; random sampling was infeasible and the researcher was compelled to carry out the experiment with the two available classes. The researcher selected class one to be the control group and class two to be the experimental group.

The main research instrument is the post-tests intended to mensurate the participants' amount of load. Accordingly, the experiment lasted for 5 successive weeks from mid-December to mid January taking the New Year and Yennayer holidays into account. As an aftermath, and to capture potential problems, reveal unforeseen challenges, and prevent

them from escalating during the administration phase, the research study was pilot tested with five students aside from the sample on the 17th of December 2020. As a consequence, a refined version of the experiment was obtained by virtue of all the recommendations. After validating the research instruments, the criterion of its reliability had to be checked through the test-retest strategy. Ergo, two participants apart from the sample performed the test twice over a time interval of a week between the first administration and the second one; from the 17th till the 24th of December 2021. By the last week of December 2020, the researcher and her participants were well-organized and prepared to instigate the intervention phase.

2.8.1 Pre-Experimental Phase

The experiment started after the permission from the head of the department of English language and literature at Si El-Haoues University Center of Barika (see appendix A). First-year LMD students were involved in this investigation with a total of 101 students divided into two groups; group one constituted 50 students and group two enclosed 51 students. The data collection had started from the first session of the first semester and lasted for 5 weeks during the academic year 2020/2021. The first contact with students was on the 16th of December 2020, prior to the assignment of the participants into the control and the experimental groups. In this session, the teacher/researcher introduced herself to the students and asked them to introduce themselves one by one to each other; then, she invited them to discuss reasons for choosing English as an option. It is worthwhile to note that subjects in all groups went through the same procedure: 1) completion of the placement test, then, assigning classes into one of two groups: Group 1 (control group), Group 2 (experimental group) recruitment and students' consents, 3) students viewed the six video presentations and answered the post-test questions, 4) filled out the Cognitive Load Instrument after viewing each of the presentations and 5) performed a questionnaire about their perceptions regarding videos-based learning.

First, the placement test took place the next session on the 22nd of December 2020; it endeavors to ensure the homogeneity of students between groups and to know their general linguistic competencies (see appendix B). Therefore, the choice of video presentations matched the participants' level. After ascertaining groups' homogeneity, the experimenter randomly assigned each class to one of the two groups; that is to say, randomly assigned to

either video or no video conditions: participants in the "video" condition viewed a video presentation, and those in the no video condition viewed the presentation that had the video was omitted.

On the 23rd of December 2020, the teacher/researcher informed all students that they would participate in a short experiment; she briefly described the procedures of the study, portrayed the purpose behind the scrutiny, and exhibited an utter picture of their roles within the research. Moreover, she informed them that they represented the selected sample and that they were assigned to be an experimental group (class 2) and a control group (class1), and that they were going to take several tests. Prior to conducting the experiment itself, the researcher gave the participants of the experimental group some instructions regarding the experiment: (1) the procedures that needed to complete multiple post-tests after each video presentation, (2) how to participate in activities pertaining to videos context, (3) how to complete the cognitive load measurement questionnaire (NASA-TLX), (4) what they were and were not allowed to do during the tests; participants were not permitted to talk to their peers or use a dictionary while taking the comprehension tests. After clearly describing the objectives and procedures of the experiment, each participant read and signed an informed consent form (see appendix C), which was collected by the experimenter who expressed her gratitude for their upcoming endeavors as well as an insurance of their anonymity on any task they would perform. Therefore, viewing the presentations was a requirement of the course, but participants were aware that they had the option of not completing the tests or not filling out the questionnaires; thereby, not having their data included in the study.

The experiment took place during regularly scheduled class periods. Both groups, the control and experimental, were taught the same learning content described in the syllabus previously, the same instructor, and the same instructional schedule and class hours in order to ensure the internal and external validity of the experiment. Moreover, the instructor guided the learning processes of both groups to prevent one group from receiving more information than the other. However, the techniques employed with each group differed. For the experimental group, the underlying principle in the followed procedure was the integration of video presentations as a technique to reduce cognitive overload. During the treatment conduction with the experimental group, the control group

did not have any systematic training on the aforementioned strategies. Instead, it was introduced to the regular syllabus of the semester.

In the videos, the English language was clear and appropriate enough for the participants' language level. The researcher designed sixty-minute lessons in which videos were integrated. The curriculum content was taught through video presentations. Discussions or brainstorming activities about the topic were used at the beginning and at the end (remaining time) of each session. Following that, the students were exposed to the videos twice: the first for a general understanding and the second for getting more details. Right after watching the video, the whole class worked through the worksheets: first students watched the corresponding video clip and then read the questions for one section to answer them. After that, the whole class checked the answers together because an interactive comprehension activity was seen as a great way to expose students to the target content.

To answer the first research question, a post-test was used to measure learners' understanding and retention with regard to the course content. A total of six video episodes were used for the video-based portion of the module. The video-based instruction served as an experimental treatment that consisted of video clips that included desirable examples followed by asynchronous discussions to engage the learners in active, constructive, authentic, and collaborative learning. After the video presentation, participants were asked about their learning outcomes in terms of comprehension, recall, and retention about the video content; thereby, they were immediately given the accompanying test in both the video-based and the traditional text-based instruction. The post-tests included a number of true-false and multiple-choice questions. The questions were about basic concepts that the video had introduced.

The second research question was answered through the questionnaire of NASA-TLX to measure learners' cognitive load. After each post-test, participants were required to rate the invested amount of mental effort and perceived task difficulty immediately (the cognitive load NASA-TLX questionnaire) (see appendix K). The third research question was answered through the administration of a questionnaire at the end of the final treatment to elicit the experimental group participants' perceptions of the use of the instructional video presentations (see appendix N). The purpose of administering the questionnaire was to consider the effects of the treatment from the perspective of the

students. The post-test design was chosen as a research instrument helping to identify any changes in the students' cognitive load perceived from the angle of the rater. The questionnaire was administered to the participants of the experimental group at the end of the semester; that is, once the treatment period was finished with the experimental group, and the regular session was completed with the control group. While the scores were collected at the beginning and the end of the study period, the reflective journals were gathered throughout the course of the semester which answered the fourth research question. The following section would describe in details the workflow of the experiment.

2.8.2 Experimental Phase

Both groups had the same learning content, went through the same procedure, the same instructor, and the same instructional schedule and class hours. Moreover, the instructor guided the learning processes of both groups to prevent one group from receiving more information than the other. This period was split into six sessions with a total of six video episodes and with a temporal sum of about six hours. Prior to each lesson, the researcher/teacher prepared a lesson plan according to which the session would proceed; and during each session, she wrote journals about how the session proceeded. The experiment was conducted following the same procedures. First, discussions or brainstorming activities about the topic were used at the beginning of each session. Following that, the students were exposed to the videos twice: first for general understanding and the second for getting more details. Right after the first view of the video, participants worked on the first section of the post-test and then re-watched the video clip to answer the second section of the post-test. Post-test questions were about the basic concepts that the lecture content introduced. After that, the whole class checked the answers together because it was seen as a great way to expose students to the target language. Finally, after the post-test students rated the perceived amount of mental effort invested in the problem through filling out the cognitive load questionnaires NASA-TLX (see appendix K). In the following lines, we will present a detailed description about the events of each session.

2.8.2.1 Session One

This session was held on the 29th of December 2020 from 8:00 am till 9:00 am with the second group (the experimental group). The video was about the story of a surfer called

Gwyn Haslock who has been catching waves for over 60 years. The learning objective of this video lecture material is to talk about famous people, making suggestions about their lives, understanding implicit facts; in addition to describing people, their physical appearance, daily activities, likes, and dislikes.

The researcher launched the warm-up through prediction activity. This is an effective way to get students to anticipate the topic. She wrote the title on the board and asked students to predict what will the video show? Or what does the title entail? Students, then, brainstormed a series of ideas, predictions, and questions that the researcher wrote down on the board. The warm-up activity lasted for 10 minutes. After that, the researcher distributed the worksheets corresponding to the post-test (see appendix E) and the NASA-TLS questionnaire (see appendix K). The next step was to show the video entitled "Can and Will: Gwyn Haslock" and to ask students to figure out the content of the video. The video presentation took about 3 minutes and 19 seconds. Afterward, participants were asked to do the first part of the post-test in 5 minutes, it consists of one activity; matching the vocabulary with the correct definition, including eight items. Following this, the teacher re-played the video presentation for the second time; then asked the students to do the subsequent activity; multiple-choices which include eight items as well taking 5minutes to complete this activity.

After the post-test, the participants were instructed to rate their invested mental effort and perceived task difficulty immediately (immediate ratings) taking 10 minutes to complete the questionnaire. Eventually, in a span of 10 minutes, the answers to the post-test were discussed together so as the students can be exposed to the target language. Since the video presentation contained desirable examples, the last 10 minutes were exploited in an asynchronous group discussion to engage the learners in an active, constructive, and collaborative learning. The teacher, then, asks her students if they have ever tried surfing. If no, what kind of sea activities they tried?

2.8.2.2 Session Two

This lesson was held on the 5th of January 2021 from 8:00 am till 9:00 am with the participants of the second group (the experimental group). The video segment was a trailer for an adventure film "The BFG" (The Big Friendly Giant) which is a book by one of the UK's favorite authors Roald Dahl. It tells the story of a little girl called Sophie who thinks

that the giant is a monster. However, it turns to protect her from the other bad giants who tried to eat her. Therefore she named him the Big Friendly Giant. The objective behind this session was to promote the realization of the requirement of a communicative technique to present the process of language-mastering by comprehension of live culture speaking another language.

The researcher began with a warm-up by asking the participants about their favorite movie or film so as to get interested in the subject. Further, she wrote the title on the board, then, asked them to guess what the abbreviation "the BFG" stands for. The warm-up activity went on for ten minutes which students came up with a list of thoughts. Thereafter, the teacher passed out the documents that would be used in the subsequent activities; post-test and NASA-TLX questionnaire. Then, the teacher started displaying the video "The BFG – official trailer".

After the multimedia presentation, which lasted three minutes, participants were given the retention test and told they would have five minutes to do the first section of the post-test; match the vocabulary with its definition. One advantage to the use of post-test only design was indicated by Al Seghayer (2001); the retention test for each video was not given before the study so as not to cause the subjects to pay special attention to words. Rather, this test was given after the vocabulary test but before the comprehension test. After five minutes, participants re-watched the video to answer the next part of the post-test; deciding about eight sentences whether true or false (see appendix F). They were given another five minutes to finish the activity.

When all the tasks were completed, respondents handed out the cognitive load questionnaire. In the questionnaire, participants were asked to rate the perceived amount of mental effort invested in the problem using a 7-point Likert scale, ranging from very low (1) to very high (7). They were given ten minutes to answer the question, after which it was collected. Ultimately, the answers to the post-test were explored in 10 minutes in order to meet the objectives of getting the students to speak the target language. Yet, the last fourteen minutes were subjugated in an interactive discussion to engage the learners in active, constructive, authentic, and collaborative learning.

2.8.2.3 Session Three

It occurred on the 6th of January 2021 from 8:00 am till 9:00 am with the participation of the same students of the experimental group. The video segment of this session described a fascinating and historic building "Windsor Castle". It is the longest continually inhabited castle in the world, the official residence of the Queen, and the destination of a million visitors each year. A national monument, Windsor Castle tells the story of a thousand years of British royal history like nowhere else and is enjoyed by visitors from all over the world. The principle objective behind this session was to account for famous places, understanding specific information, discussing value/historical importance. In addition, listening to a description of a place and understanding major details; using deictic words to describe places.

The researcher started the first ten minutes of the lesson by asking the participants about Windsor Castle and what they know about it. After sharing their ideas and thoughts, students were given the necessary resources for later use. Subsequently, the researcher played the video that took approximately four minutes. After the presentation, participants were given the tests of learning outcomes (recall and transfer of knowledge) and asked to answer the first section of the post-test which consisted of two activities. The first activity was about aligning the vocabulary with the correct definition of eight items; yet, the second activity is multiple-choices that contain six items. Each activity was devoted five minutes to be accomplished. Following that, the video was replayed for the second time. Participants were given another ten minutes to answer the second section of the post-test questions; a yes/no activity that consists of eight items and a matching activity that included eight items as well (see appendix G).

After the test, each participant was required to fill out a questionnaire to assess his or her perceived mental effort. Participants were given a hard copy of the NASA-TLX at the beginning of the session. Consequently, they had ten minutes to rate their cognitive load from a 7-point Likert scale. Thereafter, the documents of the post-test and the questionnaire were collected, and then the answers to the post-test were discussed in five minutes. In the end, the last five minutes were dedicated to an interactive discussion in which the teacher posed some questions: are there any old and important buildings in your city? Can you imagine what it would be like to live in a castle? These questions engage students in dynamic learning.

2.8.2.4 Session Four

This session took place on the 7th of January 2021 from 8:00 am till 9:00 pm, with the students of the experimental group. The video presentation discussed the story life of a Syrian swimmer who competed in the Olympic Games in Rio de Janeiro "Yusra Mardini". In the video, Yusra tells her story, she has her family and friends, and she loves to go to the pool in her hometown in Syria. Then the war came and everything changed; hence, she escaped Syria to Turkey then to Germany to become a refugee. She back at practicing and her coach helped her to achieve her dream to swim at the Olympics. The learning objectives behind this video segment are that the participants would be able to talk about personal plans, listening to a theme, and inferring meaning. Furthermore, they will be able to talk about famous people, making suggestions about their lives, understanding implicit facts, and describing their daily activities, likes, and dislikes.

The researcher launched the warm-up activity to get students to anticipate the topic. The warm-up activity required participants to write from two to four sentences about their predictions concerning being a refugee after writing the title of the video on the board. In ten minutes, students share their predictions and then listen to see if any of the things they wrote down are mentioned by their classmates. This will not only prepare them for what the listening will be about, but it also teaches them new vocabulary. Following that, the researcher distributed the worksheets corresponding to the post-test and the NASA-TLS questionnaire. She, then, asked the students to watch the video entitled "Yusra Mardini, a young refugee" and solicit its content. After the multimedia presentation, which lasted two minutes and one second, participants were required to hand out the first part of the post-test and told they would have five minutes to write down their answers. They have to match the vocabulary with the correct definition, consisting of eight items (see appendix H). Subsequently, the teacher replayed the video for students, and then she asked them to do the second part of the post-test; eight multiple-choices items within five minutes time span.

After the post-test, students were required to rate the perceived amount of mental effort invested in the problem not exceeding ten minutes. After the students had written their answers, the post-test and NASA-TLX questionnaire's worksheets were collected, after which the answers to the post-test were discussed together so as to students are exposed to the target language taking ten minutes. Afterward, the remaining time,

approximately about ten minutes was dedicated to the speaking activity in which students were asked to give their view on Yusra's story.

2.8.2.5 Session Five

It was held on the 13th of January 2021from 8: 00 am till 9:00 am with the students of the experimental group. The video presented in this session "International Women's Day – We are women" was about International Women's Day, 8 March. This video shows lots of things that women can be and do. For instance, they can be daughters, mothers, sisters, wives, and soulmates. Furthermore, they can be bosses, leaders, teachers, doctors, and lawyers. Besides, they can be scientists, musicians, engineers, and athletes. The learning objectives behind this session were to make students practice turn-taking and talk about people and their lives. In the warm-up that lasted ten minutes, the researcher asks students to write down five words or ideas that they associate with this day. Students share their lists and by doing this, students are placed in the scene, and thus effectively preparing them for the video presentation that will follow.

After sharing their ideas and thoughts, students were given the necessary materials for later use; post-test and NASA-TLX questionnaire. Next, the researcher played the video that took approximately three minutes. After the presentation, participants were asked to answer the first part of the post-test which was about ten vocabulary items that need to be matched with their definitions dedicating five minutes to perform it. Subsequently, the video was played again and participants were asked to do the second part of the post-test that consisted of two activities; filling the gap and classifying words subsequent to its group function. This part of the test took ten minutes to be completed; five for each activity.

After the test (see appendix I), participants were instructed to rate their invested mental effort and perceived task difficulty immediately, they had ten minutes to complete answering the questionnaire. The teacher, then, handed out the next section in which the answers to the post-test were discussed after their collection taking ten minutes. The last step in this session exploited the remaining time that was approximately seven minutes to an interactive discussion between students in which they were asked to discuss which women are important in their lives and how would they describe them.

2.8.2.6 Session Six

It was held on the 14th of January 2021 from 8:00 am till 9:00 am with the students of the second class who represent the experimental group. The video segment “Time Out London: Routemaster” tackles a new type of London's famous red double-decker buses called the “Routemaster”. It was an extract from real-life communication; how a girl called Sonya wants to try this new bus. Therefore, there is a communication between the girl, the announcer, an interviewer, and the men in the bus. Sonya shared her experience which claimed that it is the most overhyped piece of transport she has ever been on. The learning objectives behind this final session were to listening to account of travel means, understanding differences, talking about advantages and disadvantages.

The researcher began the first ten minutes with a warm-up by asking the participants about their previous experiences with travel means. For instance, the researcher posed the following questions: if they have ever tried any of these means? and which ones would they like to try and why?. Speak from experience is a great way to get students warmed up for watching the video, it tests their previous knowledge about the topic that will be covered in the video. The warm-up activity went on for ten minutes which students came up with a list of thoughts and ideas. Thereafter, the teacher passed out the documents that would be used in the subsequent activities; post-test and NASA-TLX questionnaire. Then, the teacher displayed the video “Time Out London: Routemaster”.

After the multimedia presentation, which lasted three minutes, participants were given the retention test and told they would have ten minutes to do the first section of the post-test which consists of two activities; matching the vocabulary with the correct definition of eight items, and then, to decide around eight items that are true or false. Thereafter, the researcher re-displayed the video again for students so as to be able to answer the second part of the post-test; identifying as well about eight items whether yes or no and filling the gaps of five sentences (see appendix J). This part of the post-test extended for ten minutes; five minutes for each activity.

After solving the problem, participants also filled out the cognitive load questionnaires NASA-TLX and rated their perceived amount of mental effort invested in the problem. The cognitive load questionnaire was handed out within ten minutes time span, after which it was collected with the worksheets of the post-test. The next step was to

answer and discuss the activities of the post-test so that meeting the objectives of having the students speak the target language. Eventually, the last eight minutes were subjugated in an interactive discussion to engage the learners in active and constructive learning. The teacher stimulated the discussion by posing a list of questions; what's your favorite form of transport? Do you like taking the bus in your country? What kind of transport do people usually use where you live? Do you think there should be more public transport in our cities? Why?

2.8.3 Post-Experimental Phase

The step of the participants' perception questionnaire was held at the end of the experimental period to the participants of the experimental group, just after the accomplishment of the last post-test and the cognitive load NASA-TLX questionnaire. The gathering stipulates the befitting timing with the experimental group members. It occurred on the 14th of January 2021, from 10:00 am till 10:30 am. The researcher distributed papers on which she requested the participants to fill out the questionnaire to elicit their perceptions about the instructional video presentations (see appendix N). In other words, the purpose of administering the questionnaire was to consider the effects of the treatment from the perspective of the students. The post-test design was chosen as a research instrument helping to identify any changes in the students' cognitive load perceived from the angle of the rater. By the end, the researcher expressed her deepest gratitude to the participants.

As a primal part of the experiment, it was dispensable for the researcher to observe participants while they proceed with the experiment. The researcher/teacher wrote journals every single detail that concerns both members of the experimental group and the control group. At the end of the experimentation, reflective journals were at the disposal to document the researcher's expectations and feelings all along the experiment period to be eventually analyzed then interpreted.

2.9 Data Analysis Procedures

Data analysis procedure is a fundamental factor because it transforms raw data into a well-organized meaningful set of information. According to Yin (2015), data analysis assigns meaning to the gathered information in a systematic and organized manner. That is

to say, the chief intent of the data analysis phase is to establish meaning in the information collected, to be systematically arranged, and presented as to search for ideas.

2.9.1 Analysis of the Quantitative Tools

The quantitative data of the placement test, the post-test, the NASA-TLX questionnaire, and the questionnaire are analyzed using the EXCEL software alongside the Statistical Package for the Social Sciences (SPSS) software 22.0 version. The numerical data in this research yielding both descriptive as well as inferential statistics including frequencies, percentages, the mean, t-test, and standard deviation.

Starting with the quantitative data gathered from both the experimental and the control groups, first, they were copied on an Excel spreadsheet to be imported to SPSS afterward. The statistical analysis was accomplished through the use of a number of t-tests. The independent-samples t-test computed differences across groups; experimental group and control group.

Responses to the NASA-TLX questionnaire and the Likert scale questionnaire questions were numerically coded and analyzed through the frequency analysis of descriptive statistics using EXCEL and SPSS software. In an excel spreadsheet, the responses were taken to calculate the frequencies and percentages. Then, the obtained results were transferred to the SPSS to run the mean and standard deviation to help to identify the statistical differences between the responses of both groups.

2.9.2 Analysis of the Qualitative Tool

Qualitative data gathered from reflective journals are analyzed under the section of content analysis. In this regard, Mayring (2004) defined content analysis as the systematic quantification of particular features that the researcher is interested in due to their frequency of occurrence in a selected context. Reading thoroughly the journals is a preliminary step towards final analysis, then, the similar patterns are to be grouped together. Annotating codes to key pieces revealed important information with relevance to the research question. According to Corbin and Strauss (2008), relevant coding should be integrated and refined to support responses to research questions to represent concepts emerging from the data. The step of coding consisted in identifying pieces that could be

classified within the same categories. The reason from setting categories is to organize information so that facilitating its interpretation. Subsequently, the categories were grouped according to the emerging themes under which they fall. Analysis ends up with a clear list of codes and themes and their definitions prior to be interpreted.

2.10 Validity of the Research Design

Due to the experimental nature of the present research work and its research methodology, data obtained are of quantitative and qualitative value. As a consequence, a number of measures were taken to address the threats of validity and to increase the reliability of the study results. The aim of studies of such nature is to provide a better understanding of a research problem than either quantitative or qualitative data by itself (Tashakkori & Creswell, 2007b). The validity of research findings refers to the extent to which the findings are an accurate representation of the phenomena they are intended to represent. Two types of validity were distinguished; internal validity and external validity.

2.10.1 Internal Validity

Internal validity relates to the validity of inferences drawn about the cause and effect relationship between the independent and dependent variables (Cresswell, 2012). That is to say, it is the degree to which a study set up the cause and effect relationship between the treatment and the observed outcome. The central issue behind an experimental design is to execute control over the surrounding conditions that would otherwise obscure the real effects of the independent variable upon the dependent one. A design is internally valid if the surrounding conditions that threaten the validity of experiments have been identified and addressed. These conditions may include history, maturation, testing, instrumentation, regression, selection, experimental mortality, and interaction of threats. All of these have a greater impact on the internal validity of the research design (Cresswell, 2012).

For this research, the sampling techniques used may introduce threats that influence the outcome. Convenience sampling may over-represent or under-represent groups because it gets the views of a specific group of people and not the whole population so that affecting negatively the quality of data gathered. Moreover, the sampling method was intended to address the problem of regression. To remedy the situation in which participants may become familiar with the outcome measures and remember responses for

later testing, the outcomes were measured only once. Standardized procedures were used throughout the experiment to avoid the change in measuring instruments so that the scales used in the post-test are dissimilar. Since post-test only design was opted for the study, scores would not be predictable and participants had not been selected based on extreme scores because they will do only one test which is the post test. This choice of research design deemed judicious to control the clouding variables that might affect the outcomes of the experiment.

Furthermore, the control and experimental groups do experience the same activities (except for the treatment) during the experiment to avoid occurring events in the post-test that may influence the outcome. As a result, a careful selection of participants who mature or develop in a similar way for both the control and experimental groups helps guard against maturation that may affect their scores in the post-test. However, the diffusion of treatments for the control and experimental groups was different; the two groups were separate in an experiment so that participants in the experimental group cannot communicate and discuss the techniques used in the classroom with other participants in the control group. Finally, to avoid the Hawthorne effect; is a kind of reactivity in which respondents alter some aspects of their behavior in reaction to the fact that they are being observed. Participants in this study from the control group were not informed about the experiment and its procedures. Such a step was hoped to resolve as well the problem of John Henry effect; the determination of the control group participants to outperform the experimental group in order to prove their worth. With all that said, internal validity of the present design was to some extent safeguarded and the differences between groups are credibly attributed to the treatment (video presentations) intervention.

2.10.2 External Validity

External validity refers to the validity of the cause and effect relationship and whether the results of a study can be generalized to a larger population (Cresswell, 2012). Threats to external validity are problems that threaten the ability to draw correct inferences from the sample data to other persons, settings, treatment variables, and measures. In other words, external validity is addressed by delineating inclusion and exclusion criteria, describing subjects in terms of relevant variables, and assessing generalizability. Thus, a design is externally valid if the sample under investigation is representative of the

population from which it was drawn. For that reason, the deployment of a relatively small scale of 50 students as the research participants and the convenience sampling gambles external validity and the findings of this investigation cannot be generalized beyond the case subjects. One solution to these problems is to replicate the study at a later time rather than trying to generalize results to other times.

2.11 Pilot Study

Students were not used to learning through video presentations which made it essential that they should comprehend how this technique functions. Being comfortable with a new tool necessitates the affordance of adequate instructions and training for students. In light of the aforementioned version, the pilot study sample consisted of five students randomly selected from the target population and consulted from outside the studied sample; the participants were chosen from the control group as there were only two first-year groups at the University Center. One pilot session was held on December 17th, 2020 a week before the start of the instructional sessions to carry out a range of objectives. First, checking how participants perceive the clarity and complexity of the task instructions; then, knowing the roles that the teacher is supposed to perform at each phase of the instructional sessions; moreover, ensuring the amount of time allotted for the instructional sessions, and finally, testing the efficacy and feasibility of the stages involved in the treatment sessions. While these steps were designed in light of the theoretical insights, it has not been assured that such steps would be possible to complete. The pilot study was, accordingly, intended to yield pilot students' cognitive load abilities. Through the study of pilot cognitive load, it was hoped to verify whether the steps adopted could assist in collecting the required data, specifically those related to the decrease in students' cognitive load.

The participants were exposed to a single post-test (see appendix D) of a watched video titled “How can more women get into politics?”. The teacher provided students with handouts consisting of four activities and asked them to watch the video and do the set of activities in addition to writing their comments, opinions, and feedback about the experience at the end of the instructional session; (the steps are explained thoroughly in the research experiment section);

- The first activity that takes place before watching the video was allotted about 5 minutes.
- The second and the third activities were executed after watching the video; it took about 10 minutes each.
- The last activity was allotted 5 minutes.

While watching the videos and answering the test, the researcher took remarks alongside the students' feedback regarding objectives sets earlier. In the subsequent session; December 24nd, 2020, participants were invited to read the feedback of the teacher and to provide their views about the treatment pilot session. This step aimed to obtain further information from the participants themselves on the difficulties and the challenges that could reduce the effectiveness of the intervention. Notes from the teacher and comments from the students on the steps followed in the pilot session allowed for better management of the tasks and steps involved in the integration of the intervention.

Based on the outcomes obtained from observing students' behaviors and responses to the instructions of the pilot session, it was noted that the participants required a second viewing of the video so that they could get the specific details and implicit meaning. Thus, the students' feedback provided confirmed this remark. As a result, the teacher decided to add an additional video viewing. Nevertheless, all students expressed positive feedback through their comments; "I enjoy learning through videos" "watching videos is interesting" etc. The analysis of the pilot study that could improve the effectiveness of the instructional sessions indicated that there are no adjustments or modifications were made with regard to the task instructions' clarity and difficulty, amount of time, or even the steps of the treatment.

2.12 Ethical Consideration

Ethical consideration is an essential part of the research that needs to remain at the forefront of the study. Ethics is a vital element of the researcher's conducts as to the varied relations he/she establishes with respondents involved in this research. Ethical guidelines will strengthen the research, ensure the validity, and promote its contribution to scientific studies. Ethical consideration involves from the researcher to safeguard the dignity of subjects and the publication of the information in the research so that comprising the basis of every research stage.

As the first stage, an official written request was submitted at the level of the administration of the University Center of Si El-Haoues, Barika to permit the researcher to conduct and embark upon the experiment (see appendix A). Additionally, in order to attempt participants' rights, an informed consent letter was provided to them in order to take part in the study under examination, as far as the research title, procedures, objectives, benefits, duration of the experiment, and their role within it are concerned, was established prior to any research move. The consent includes an assurance about the absence of any harm or inconvenience resulting from their participation. Although it was mentioned in the consent that their decision to take part in the treatment or to decline it was totally bound to their free will, all students expressed their desire to carry on their participation. One signed copy was kept for the researcher and another one for the concerned participant (see appendix C). Responses of the post-test and the two questionnaires were utterly held anonymous and confidential and no names were put to use throughout data analysis and report procedures. Eventually, data gathered for the research purposes were kept unadapted, findings and interpretations were have had no endeavours to be changed so that they do falsely suite the research ends, in which it is a fundamental point that was confirmed.

2.13 Conclusion

This chapter included detailed accounts of the research design and research methods leading this study. It also dealt with the research setting, the sample and sampling techniques, and the research procedure. Based on a quasi-experimental design, the study followed a mixed-method approach where a combination of instruments was used to collect data and have contributed to a thorough understanding of the research topic. The analysis of the data as well as the results and findings will be discussed in details in the following chapter.

Chapter Three:

Data Analysis, Interpretations & Discussions

Chapter Three: Data Analysis, Interpretations & Discussions

3.1 Introduction

3.2 Analysis of Exploratory Phase Findings

3.2.1 Placement Test

3.3 Analysis of Experimental Phase Findings

3.3.1 Analysis of Quantitative Data

3.3.1.1 Analysis of the Post-test

3.3.1.1.1 Hypothesis Testing

3.3.1.1.1.1 Independent-samples T-test

3.3.1.2 Discussion of Post-test Findings

3.3.1.3 Analysis of the NASA-TLX Questionnaire

3.3.1.4 Discussion of the NASA-TLX Questionnaire Findings

3.3.2 Analysis of Qualitative Data

3.3.2.1 Analysis of the Reflective Journals

3.3.2.2 Discussion of the Reflective Journals Findings

3.4 Analysis of the Post Experimental Phase Findings

3.4.1 Analysis of the Post Treatment Questionnaire

3.4.1.1 Questionnaire Reliability

3.4.1.2 Demographic Information

3.4.1.3 Section One

3.4.1.4 Section Two

3.4.1.5 Section Three

3.4.2 Discussion of the Post-Treatment Questionnaire Findings

3.5 Conclusion

3.1 Introduction

This chapter undertakes the task of presenting the findings and their analysis. The results of the study are presented in this chapter by analyzing the data obtained through the data collection instruments. The data collected consists of the post-test scores of students' acquisition, students' responses to the rating scale questionnaire, the responses of students' perceptions to the questionnaire, and the teacher's reflective journals. The data are organized based on the research questions that were specified in the first chapter. Simultaneously, hypotheses were tested to be confirmed or rejected. Starting with, the data obtained from the post-test were used to answer the first research question. The rating scale questionnaire was used to answer the second research question. As for the third research question, an analysis of the teacher's journals was used to answer it. However, the data obtained from the questionnaire were used to answer the fourth research question.

3.2 Analysis of the Exploratory Phase Findings

Subsequent to identifying the research problem, a rich description of the research population and sample was carried out. The analysis of data gathered at the exploration phase is amplified below. This section tackles the analysis sprung from the placement test of the control and the experimental groups and data generated to discern the test-retest reliability.

3.2.1 Placement Test

The placement test arranged in the current investigation measures the learners' general English level. Table 3.1 below will be used to place learners provisionally at one of the six levels of English.

Table 3.1

General English Levels According to Placement Test

Level	Beginner	Elementary	Pre-intermediate	Intermediate	Upper-intermediate	Advanced
Score	**0-9**	**10-25**	**26-45**	**46-65**	**66-85**	**86-100**

The following table displays the descriptive statistics of the general English level of the control group and the experimental group:

Table 3.2

Placment Test Description Statistics

Group		N	Mean	Std. Deviation
Placement Test	**Experimental Group**	**33**	**35.58**	**6.746**
	Control Group	**33**	**35.55**	**6.727**

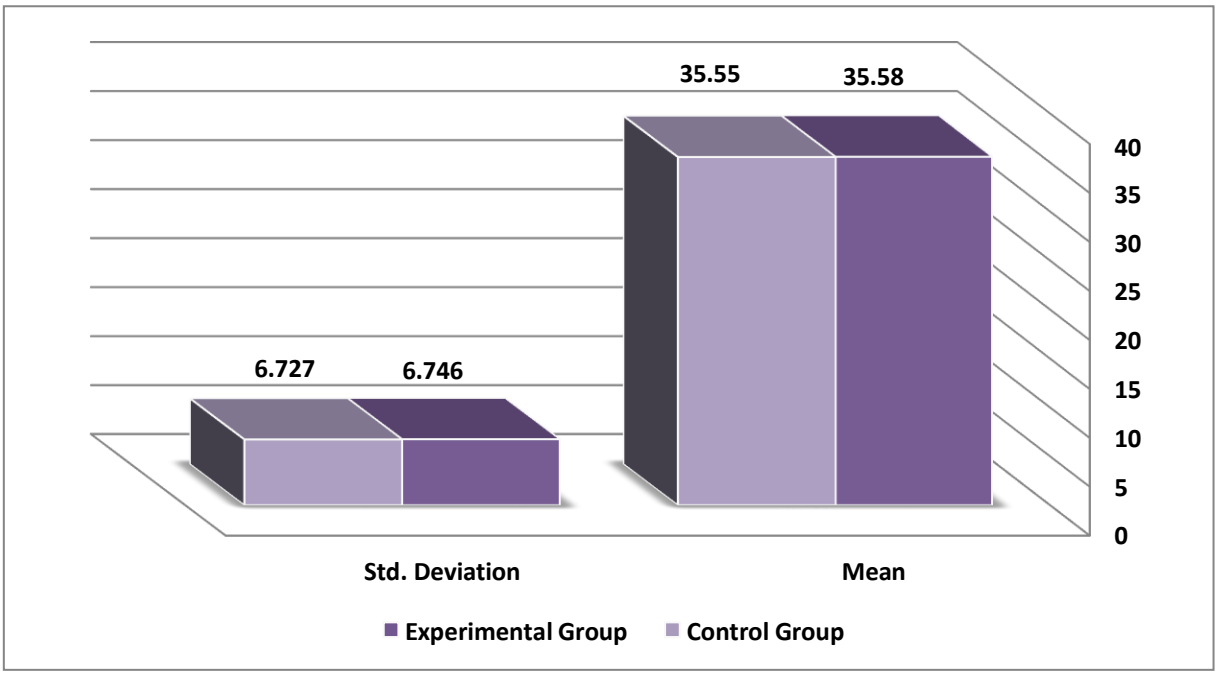

Figure 3.1 **Placement Test Means**

As revealed in table **3.2** and Figure **3.1**, the experimental and the control groups have almost analogous means of placement test scores which were **M = 35.58 and M = 35.55** respectively; that is about **35** marks. The overall mean for each group falls under the pre-intermediate category. In addition, the standard deviation of the two groups corroborates that the scores are consistently dispersed within equivalent intervals of **6.746** (experimental group) and **6.727** (control group).

A detailed and comprehensive statistical confirmation of the equivalence of placement test scores of the experimental and control groups is accomplished via the calculation of Independent-Sample T-Test between the two groups as indicated in table **3.3:**

Table 3.3

Placement Test Experimental *Group/Control Group Independent Sample T-Test*

	Levene's Test for Equality of Variances		**t-test for Equality of Means**		
Equal variances assumed	**F**	**Sig.**	**t**	**Sig. (2-tailed)**	**Mean Difference**
	0.000	**0.995**	**0.018**	**0.985**	**0.030**

Table **3.3** elucidates the calculated results of the placement test via Independent-Sample T-Test across the experimental and control groups. In Levene's Test; **F = 0.000 and Sig. = 0.995 > 0.05** were obtained. Both values validate the equality of variances. Accordingly, the results of the T-Test in compliance with "equal variances assumed" are validly considered. The **Sig. (2-tailed) value of P = 0.985 > 0.05** demonstrates no significant differences regarding the level of English across groups. It can be declared that the experimental and control groups are equivalent in the scores of the placement test. According to the aforementioned statistical calculations, ultimately, both groups are equivalent since the placement test scores do not differ significantly.

3.3 Analysis of the Experimental Phase Findings

This section is divided into two distinct parts. The main pillar will be depicted in the first part; quantitative data analysis that encompasses tests analysis, NASA-TLX questionnaire, and students questionnaire. The detailed analysis is described infra after being presented in tables and graphs. The second part, however, undertakes the analysis of qualitative data.

3.3.1 Analysis of Quantitative Data

The integration of the treatment was carried out in this section. This section aims to examine the research hypotheses by analyzing the data collected from the test as well as the parametric procedures of the independent t-tests. This section elaborates the statistically tested and calculated results of the effect of video-based learning on students' cognitive load.

3.3.1.1 Analysis of the Post-test

This section attempts to provide and discuss the results of post-test scores in order to evaluate the effectiveness of the treatment. Data analysis permits answering the first research question: *To what extent does the use of video-based learning presentations affect the cognitive load of EFL learners?* And to test the cardinal hypothesis: *If video-based learning presentations are integrated, there will be significant differences in EFL students' cognitive load in the experimental group compared to students in the control group*. The analysis, moreover, intends to determine whether the decrease in the cognitive load, if any, is attributable to the use of video-based learning presentations or other variables. Since the amount of cognitive load is measured in terms of scores, hypothesis testing is based on students' performance on the post-tests after watching the video presentations. Seeking to determine the efficiency of the treatment, post-test scores are compared between groups.

3.3.1.1.1 Hypothesis Testing

Hypothesis testing is a type of statistical inference that involves drawing conclusions about a parameter of a population or probability distribution using data from a sample.

3.3.1.1.1.1 The Independent Samples t-tests

T-tests are mainly the most used statistical techniques for comparing two means, which, in turn, are divided into two types. According to Sedgwick (2010), the independent sample t-test is the first kind to be employed when the two groups being compared are not connected by means of common individuals. Second, when the two compared means are assigned to the same individuals under two distinct circumstances, the paired sample t-test is used. Cardinally, for the purpose of investigating the assumed change in this research study, the unpaired samples t-test was utilized. The independent sample t-test is used to

scrutinize and validate the efficacy of the treatment between groups. In other words, to check whether there is a statistically significant difference between the control and experimental groups' post-test scores means.

In this section, we will examine the disconfirmation and the confirmation of the null hypothesis ($\mathbf{H_0}$) and the alternative hypothesis ($\mathbf{H_1}$) respectively. In fact, the **p**-value is the deciding aspect to determine whether the differences are significant or not. Since the **p**-value represents the probability, it designates whether the experiential causal relationships are accredited to chance or if differences in mean frequencies between two data sets are the outcome of other kinds of treatment. The **p**-value ranges from **0** to **1**; thus, the difference between groups is considered significant if the **p**-value is **> 0.05**. Consequently, less than a **5%** probability in changes in means between and within groups is attributed to chance. However, this percentage is commonly accepted in social sciences.

- The disconfirmation of the null hypothesis ($\mathbf{H_0}$); **H0 = p < 0.05,** if the **p** value is less than **0.05**, the null hypothesis is disproved, indicating a significant difference between the experimental and control groups after the integration of video-based presentations.

  - ✓ *If video-based learning presentations are integrated, there will be no significant differences in EFL students' cognitive load in the experimental group compared to students in the control group.*

- The confirmation of the alternative hypothesis ($\mathbf{H_1}$); **H1 = p < 0.05**, if the p value is less than **0.05**, the alternative hypothesis is confirmed, ensuring that the differences between the experimental and control groups are significant and attributed to the treatment.

  - ✓ *If video-based learning presentations are integrated, there will be significant differences in EFL students' cognitive load in the experimental group compared to students in the control group.*

Table 3.4

Descriptive Statics of the First Post-test of the Experimental and Control Groups

	N	Mean	Std. Deviation	Std. Error Mean
Experimental Group Post-Test (01)	**34**	**12.12**	**2.267**	**.389**
Control Group	**34**	**8.91**	**1.975**	**.339**

The independent-samples t-test delineates the result differences of the first posttest between the experimental and control groups. **Table 3.4** indicates comparative descriptive statistics, first, on the number of participants within the experimental group that was **N (34)** and the number of participants within the control group that was **N (34)**. Second, the means of the scores of the first post-test is **12.12** with a standard deviation of **2.267** and a standard error mean of **.389** for the experimental group whereas the control group mean score is **8.91** with a standard deviation of **1.975** and a standard error mean of **.339**.

Table 3.5

Independent T-Test of the First Post-test of the Experimental and Control Groups

		Levene's Test for Equality of Variances		T-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Differences	Std. Error Differences	95% Confidence Interval of the Difference	
									Lower	Upper
Post-test (01): Experimental and Control groups	Equal variances assumed	1.525	.221	6.218	66	.000	3.206	.516	2.176	4.235
	Equal variances not assumed			6.218	64.788	.000	3.206	.516	2.176	4.236

Table 3.5 displays, first, that Levene's Test for Equality of Variances shows that **TS = f = 1.525;** the p-value (Sig. 2-tailed) **= 0.221; p > 0.05** which designates that there is no evidence which suggests that variances of the experimental and the control groups are not equal. This implies that the distribution of the scores in both groups is similar in shape that is already backed up by their equal standard deviations which are the square roots of their variances. Second, the results demonstrated by the t-test Equality of Means show that **TS = t (66) = 6.218; p-value = 0.000 and p < 0.05**; which indicates that the mean score between the groups is significantly different **(3.206)** and that the null hypothesis with respect to the existence of no significant difference between the experimental and the control groups on the performance of the post-test is statistically rejected, and that less than **0.01%** of the difference between the groups' performance is due to chance at the probability level of **p-value = 0.05.** It is **95%** confident to say that the actual difference of the mean scores between the groups is between **2.176** and **4.236**.

Table 3.6

Descriptive Statistics of the Second Post-test of the Experimental and Control Groups

	N	Mean	Std. Deviation	Std. Error Mean
Experimental Group Post-Test (02)	**36**	**12.19**	**2.303**	**.384**
Control Group	**36**	**9.03**	**2.035**	**.339**

The table supra **3.6** displays the comparative descriptive statistics that indicate the number of participants within the experimental group that was **N (36)** and those within the control group that was **N (36)** on the performance of the second posttest. The overall posttest mean score for the experimental group is **12.19** with a standard deviation **(SD) = 2.303** and a standard error mean of **.384** whereas the control group mean score is **9.03** with a standard deviation **(SD) = .356** and a standard error mean of **.339**.

Table 3.7

Independent T-Test of the Second Post-test of the Experimental and Control Groups

		Levene's Test for Equality of Variances		T-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Differences	Std. Error Differences	95% Confidence Interval of the Difference	
									Lower	Upper
Post-test (02): Experimental and Control groups	Equal variances assumed	3.329	.072	6.182	70	.000	3.167	.512	2.145	4.188
	Equal variances not assumed			6.218	64.788	.000	3.167	.512	2.145	4.189

According to the results demonstrated in **Table 3.7**, Levene's Test for Equality of Variances exhibits that **TS = f = 3.329; p-value = 0.072; p > 0.05** which indicates that the equality of variances of the experimental and the control groups are not significantly different. Emphatically, the results mean that the distribution of the scores in both groups is similar in shape that is already backed up with their equal standard deviations which are the square roots of their variances. Moreover, the results read from the t-test Equality of Means display that **TS = t (70) = 6.182; p-value = 0.000 and p < 0.05**; which indicates that the mean differences score between the groups is significantly different **(3.167).** This accounts for the rejection of the null hypothesis with respect to the existence of no significant difference between the experimental and the control groups on the performance of the post-test. Apropos to this, less than **0.01%** of the difference between the groups' performance may be owing to chance but rather a percentage of **99.9999%** is attributed to the effects of the treatment. It is **95%** confident to say that the actual difference of the mean scores between the groups is between **2.145** and **4.189**.

Table 3.8

Descriptive Statistics of the Third Post-test of the Experimental and Control Groups

	N	Mean	Std. Deviation	Std. Error Mean
Post-Test (03) Experimental Group	**36**	**12.50**	**2.158**	**.360**
Control Group	**36**	**8.56**	**2.006**	**.334**

The general comparative descriptive statistics of the experimental and the control groups on the performance of the third post-test are exhibited in **Table 3.8.** The number of participants within the experimental group was **N (36)** and those within the control group was **N (36)**. The means of the sum of the scores of the post-test are **12.50 (SD=2.158)** with standard error mean of **.360** and **8.56 (SD=2.006)** with a standard error mean of **.334** respectively.

Table 3.9

Independent T-Test of the third Post-test of the Experimental and Control Groups

		Levene's Test for Equality of Variances		T-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Differences	Std. Error Differences	95% Confidence Interval of the Difference	
									Lower	Upper
Post-test (03): Experimental and Control groups	Equal variances assumed	.210	.648	8.032	70	.000	3.944	.491	2.965	4.924
	Equal variances not assumed			8.032	69.631	.000	3.944	.491	2.965	4.924

As presented in **Table 3.9**; the cardinal statistics that were calculated by the independent-samples t-test are the post-test differences between the experimental and control groups as they answer the main question of the concurrent investigation. Starting with Levene's Test for Equality statistics that reveals **TS = f = 0.210; p-value = 0.648; p > 0.005** which infers that the equal variances between both groups are assumed i.e. post-test data of the experimental and control groups are homogenous and normally distributed for Levene's values. Furthermore, the results exhibited from the t-test Equality of Means indicate that **TS = t (70) = 8.032**; **p-value = 0.000** which is **p < 0.05** which provides evidence that there is a **0.001%** probability that differences between group post-tests are due to chance with an overall mean difference score of **(3.944).** This accounts for the rejection of the first statistical hypothesis (null hypothesis) $\mathbf{H_0 = p > 0.05}$ whereas affirmed the second one (alternative hypothesis) $\mathbf{H_1 = p < 0.05}$. It is **95%** confident to say that the actual difference of the mean scores between the groups is between **2.965** and **4.924**. Arguably, it is concluded that there is a significant difference between the experimental and control group post-tests.

Table 3.10

Description of the Fourth Post-test of the Experimental and Control Groups

	N	Mean	Std. Deviation	Std. Error Mean
Experimental Group Post-Test (04)	**36**	**11.75**	**2.143**	**.357**
Control Group	**36**	**8.64**	**2.113**	**.352**

A closer look at the descriptive statistics of the examination of fourth post-test scores of both groups is shown in **Table 3.10**. The number of participants within both groups was **N (36)**. The overall posttest mean score for the experimental group is **11.75** with a standard deviation of **2.143** and standard error mean of **.357** whereas **mean = 8.64** with a standard deviation of **2.113** and a standard error deviation of **.352** for the control group.

Table 3.11

Independent T-Test of the Fourth Post-test of the Experimental and Control Groups

		Levene's Test for Equality of Variances		T-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Differences	Std. Error Differences	95% Confidence Interval of the Difference	
									Lower	Upper
Post-test (04): Experimental and Control groups	Equal variances assumed	.130	.719	6.202	70	.000	3.111	.502	2.111	4.112
	Equal variances not assumed			6.202	69.986	.000	3.111	.502	2.111	4.112

As it can be noticed in **Table 3.11**, Levene's Test for Equality of Variances shows that **TS = f = 0.130; p-value = 0.719; p > 0.05** which indicates that the variances of the experimental and the control groups are not significantly different so that the t-test results by which the assumption of the equality of variances between both groups is considered. This implies that the distribution of the scores in both groups is similar in shape that is already backed up by their equal standard deviations. Yet, the results demonstrated from the t-test Equality of Means show that **TS = t (70) = 6.202; p-value = 0.000** and **p < 0.05** which suggests that the mean score between the groups is significantly different **(3.111).** The results inferred that the null hypothesis with regard to the fact that there is no significant difference between the performance of the experimental group on the post-test is rejected. Apropos to this, **99,99%** of the computed difference may be due to the treatment and less than **0.01%** of the difference between the groups' performance is due to chance at the probability level of **p = 0.05.** Additionally, it is **95%** confident to say that the actual difference of the mean scores between the groups is between **2.111** and **4.112**.

Table 3.12

Descriptive Statistics of the Fifth Post-test of the Experimental and Control Groups

	N	Mean	Std. Deviation	Std. Error Mean
Experimental Group Post-Test (05)	**37**	**11.78**	**2.057**	**.338**
Control Group	**37**	**8.51**	**2.050**	**.337**

Table 3.12 above delineates the comparative descriptive statistic differences of the fifth posttest between the experimental and control groups. The table reveals the number of participants within the experimental group that was **N (37)** and those within the control group that was **N (37)**. It is noticed that the overall posttest mean score for the experimental group is **11.78** with a standard deviation of **SD = 2.057** and a standard error mean of **.338**. As regards the control group mean score is **8.51** with a standard deviation **SD = 2.050** and a standard error mean of **.337**.

Table 3.13

Independent T-Test of the Fifth Post-test of the Experimental and Control Groups

		Levene's Test for Equality of Variances		T-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Differences	Std. Error Differences	95% Confidence Interval of the Difference	
									Lower	Upper
Post-test (05): Experimental and Control groups	Equal variances assumed	.326	.570	6.851	72	.000	3.270	.477	2.319	4.222
	Equal variances not assumed			6.851	71.999	.000	3.270	.477	2.319	4.222

The results in **Table 3.13** exhibit that Levene's Test for Equality of Variances shows that **TS = f = 0.326; p-value = 0.570; p > 0.05** which indicates that there is no evidence suggests that variances of the experimental and the control groups are not equal. Emphatically, this provides evidence that the distribution of the scores in both groups is similar in shape that is already backed up by their equal standard deviations. Subsequent, the results inferred by the t-test Equality of Means display that **TS = t (72) = 6.851; p-value = 0.000 and p < 0.05**. This mean difference score between the mean scores of the CG and EG reported a highly significant difference and suggests that the EG had higher scores in the post-test. This indicates that the experimental group outperformed the control group. Besides, the mean score between the groups was significantly different **(3.270)**, and that the null hypothesis is statistically rejected. This affirmed that less than **0.01%** of the difference between the groups' performance is due to chance; but rather a percentage of **99.9999%** is attributed to the effects of the treatment. It is **95%** confident to say that the actual difference of the mean scores between the groups is between **2.319 and 4.222**.

Table 3.14

Descriptive Statistics of the Sixth Post-test of the Experimental and Control Groups

	N	Mean	Std. Deviation	Std. Error Mean
Experimental Group Post-Test (06)	**41**	**11.93**	**2.240**	**.350**
Control Group	**41**	**8.39**	**1.896**	**.296**

Table 3.14 delineates the comparative descriptive statistics that indicate the participants' performance on the sixth posttest. Regarding the number of participants within the experimental group was **N (41)** and those within the control group was **N (41)**. The examination of posttest scores of both groups shows that the mean of the experimental group was **11.93** with a standard deviation of **SD = 2.240** and a standard error mean of **.350** while the control group mean score was 8.39 with a standard deviation **SD = 1.896** and a standard error mean of **.296**.

Table 3.15

Independent T-Test of the Sixth Post-test of the Experimental and Control Groups

		Levene's Test for Equality of Variances		T-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Differences	Std. Error Differences	95% Confidence Interval of the Difference	
									Lower	Upper
Post-test (06): Experimental and Control groups	Equal variances assumed	1.247	.268	7.716	80	.000	3.537	.458	2.624	4.449
	Equal variances not assumed			7.716	77.867	.000	3.537	.458	2.624	4.449

A closer look at the statistics in **Table 3.15**, Levene's Test for Equality of Variances statistics reveals that equal variances are assumed. **TS = f = 1.247; p-value = 0.268; p > 0.05;** means that the Equality Variances of the experimental and the control groups are not significantly different. This suggests that the distribution of the scores in both groups is similar in shape and data are homogenous and normally distributed for Levene's values. The results of the T-test for Equality of Means have also shown that **TS = t (80) = 7.716; p-value (Sig. 2-tailed) = 0.000 and p < 0.05** which suggests that the mean score between the groups is significantly different **(3.537).** Apropos to this, there is a **0.001%** probability that differences between group post-tests may be due to chance. As a result, the first statistical hypothesis $\mathbf{H_0 = p > 0.05}$ is rejected whereas the second one $\mathbf{H_1 = p < 0.05}$ is confirmed. It is **95%** confident to say that the actual difference of the mean scores between the groups is between **2.624** and **4.449.** It is, arguably, concluded that there is a significant difference between the experimental and control group post-tests.

3.3.1.2 Discussion of the Post-Test Findings

The major purport propelling the act of conducting this probe was to investigate how the integration of video-based learning presentations affected the cognitive load of first-year EFL students at Barika University Center. The data gathered and analyzed in the previous section have aided in addressing the first research question: *To what extent does the use of video-based learning presentations affect the cognitive load of EFL learners?* It also worked towards the confirmation or rejection of the research hypotheses; null hypothesis: *If video-based learning presentations are integrated, there will be no significant differences in EFL students' cognitive load in the experimental group compared to students in the control group*, whereas the directional hypothesis: *If video-based learning presentations are integrated, there will be significant differences in EFL students' cognitive load in the experimental group compared to students in the control group*. In an endeavor to operationalize the construct of academic performance, we selected to rate students' performance based on the extent to which they effectively process information. Students in both the control and the experimental groups were assigned to watch a video and then take a post-test to examine their knowledge acquisition based on their perception of the videos' content. After the quasi-experiment, the hypotheses were tested by comparing the scores of the control and experimental groups on the academic performance tests.

As previously discussed, cognitive load is a challenging area of investigation for researchers due to the abstract nature it has along with the set of multidimensional features of the concept. As noted in the literature review by Cook (2009), it is difficult to detach, measure, and deal with the impact of various treatments on cognitive load. In order to assess the amount of knowledge gained as well as the cognitive capacity available to process it, the current research went on a performance-based measure design. Video presentations were predicted to decrease the learners' cognitive load, thereby freeing up their cognitive resources, which in turn would allow them to easily process the received information so that improving their performance. In other words, there is a straightforward relationship between the level of cognitive load and the academic performance of learners; when cognitive load is lowered; learners' cognitive processing abilities will be increased resulting in improved academic performance. As an aftermath, after the implementation of video-based learning presentations, the numerical findings of this scrutiny revealed a positive statistically significant difference in the mean scores of the post-test between the

experimental group and the control group. The experimental group significantly outperformed the control group; yet, the latter's level of performance remained somewhat low. In a broader stance, as shown in tables **3.5**, **3.7**, **3.9**, **3.11**, **3.13**, and **3.15**, the measurement of **P-value (.005)** between both the treatment and the comparison groups was remarkably different after the intervention of the treatment. With a **P-value** of **0.000** which is **< 0.05** i.e. there is a **0.001%** probability that the differences between group post-tests are attributed to chance. Consequently, these findings allow us to confidently reject the null hypothesis **H0 = p > 0.05**: *If video-based learning presentations are integrated, there will be no significant differences in EFL students' cognitive load in the experimental group compared to students in the control group*.

Likewise, the total scores and means of participants in the experimental group were relatively higher than those in the control group. Inasmuch, the findings indicated a positive change in the academic performance of the participants in the experimental group after the treatment's integration, thus, confirming the alternative hypothesis **H1 = p < 0.05**: *If video-based learning presentations are integrated, there will be significant differences in EFL students' cognitive load in the experimental group compared to students in the control group*. It is therefore concluded that the video-based learning presentations used in this examination effectively reduced learners' cognitive load, demonstrating that video-based learning is more useful in increasing learners' understanding of the subject matter than standard/traditional instructional methods of teaching; thus, improving their academic performance.

In presenting the statistical data, we aimed to expand our understanding of the efficacy of video-based learning in reducing cognitive load by highlighting various aspects such as content understanding, language acquisition, and knowledge perception. Correspondingly, we investigated whether the amount of cognitive load causes any effect in increasing students' academic performance. It is set up to check whether this educational intervention (video-based learning) has resulted in the acquisition of a substantial knowledge of a foreign language and to test whether audiovisual technology (video) is an effective method of foreign language teaching/learning. Most of the case studies reviewed affirm the effectiveness of video-based learning as a potent medium for foreign language teaching and learning. Many scholars like Harmer believes that video-based learning has the potential to promote learning outcomes so that academic performance.

Compared to the control group, the results of this study point out that video formats were perceived as an efficient educational tool for rising participants' acquisition of knowledge of the foreign language. The results of this study, thus, correspond to the findings of (Balslev, De Grave, Muijtjens, & Scherpbier, 2005; Kay, 2012) who compared video-based learning supported by a cognitive approach to text-based learning. The findings showed statistically significant differences in learners' skills. The results of this study resonate with those of previous studies such that conducted by Lin and Tseng and Hsu et al. (2012) who carried out two studies to investigate the effect of different video-based learning designs on enhancing English language skills of K-12 pupils. The findings showed that the group that used video-based learning outperformed the other group. Other studies have reported that employing video format as an educational tool has improved teaching methods and increased learning outcomes. Conversely, few studies found no statistically significant differences between video-based learning and text-based learning. In essence, videos are one of the audiovisual technologies that allow the development of all channels of perception while boosting students' cognitive activity (Tight, 2010). Video-based learning mainly impacts human learning and memory in a positive way; that is, it enhances an individual's ability to store information from video stimuli into long-term memory and consequently retrieve them easily (Thornton & Kaya, 2013). The medium of video is a combination of auditory/verbal and visual encoding modalities which could be used as a valuable incentive to store and encode information than merely spoken, silent, or printed words.

Videos, in particular, could optimize the perception of the material as they employ two information perception channels; audial and visual. In view of Thornton and Kaya (2013), an individual always has a dominant perceptual mode that permits him/her to perceive information better than others. The dual input is a distinctive feature for video format, i.e., the integration of the visual and auditory/verbal encoding modes is undisputedly the most successful, especially if the video material is meaningful, relevant, and distinctive. The previous declaration has been equally certified by various theorists such as Kroll and Sunderman (2003) who revealed that the combination of multiple mechanisms is a fundamental phenomenon of word-learning.

From a narrower angle, the findings of this scrutiny further validate the empirical outcomes of a study conducted by Chien and Chang (2012) who sought to determine the

relationship between perceived mental effort and post-tests performance among college students. They placed students into three diverse multimedia groups (text, audio, and video) to measure their conceptual knowledge, and then they completed F. G. Paas (1992) perceived mental effort instrument and performed a post-test. The results confirmed that students exposed to video presentations reported lower amounts of perceived mental effort and performed better on post-tests than students subjected to traditional delivery. While the results of this study are in line with a number of theoretical premises and empirical findings, they also contradict others. One of the studies providing statistical evidence on the few gains yielded by videos compared to other teaching tools was conducted by Medula (2012) who warns that overreliance on multimedia such as video caused learners to exert higher mental effort, which was reflected in their poor performance on post-tests. He fulfilled that learners were unable to understand complex information owing to the overstimulation of the video presentations.

According to Choi and Johnson (2005), the knowledge presented via video format is considered to be easier to acquire and remember than in text format. Actually, integrating prompts for students to engage in the sort of cognitive activity required to process information may assist them in building and testing mental models as well as explicitly change video watching from a passive-learning experience to an active-learning experience. Fulfilling the previous claim, it is necessary to; first, optimizing cognitive load by lessening unnecessary load while enhancing relevant load. Cognitive load theory puts forward that cognitive load can foster learning. The task orientation of the actual cognitive activity is a factor directly associated with learning. By distinguishing between task-relevant "germane" and task-irrelevant "extraneous" utilization of cognitive resources, cognitive load can favorably influence learning. In fact, cognitive load depends on the characteristics of the task being delivered. Yet, major measurement issues can occur as both types of load employ the same resources. Researchers emphasized that in order to deliver challenging information in various multimedia formats, instructional designers should ensure that the content is well-designed so that students can understand and grasp information. The more difficult a task, the greater cognitive capacity is required to solve or complete it. This feature is incorporated into the theory of cognitive load through the concept of intrinsic cognitive load. Typically, it is conceptualized by the term "element interactivity" which is a measure of task difficulty based on the number of conceptual components that have to be retained in the mind simultaneously to solve a given task.

Cognitive load theory emphasizes that the intrinsic cognitive load can be made more manageable and the germane cognitive load can be adjusted and optimized in ways that are conducive to learning by directing more attention towards relevant learning processes through well instructional design. Similarly, along the same line, the previous assertion lends support to what researchers (Leppink, Paas, Van der Vleuten, Van Gog, & Van Merriënboer, 2013) have suggested that germane cognitive load can be influenced by the instructional design of the material. Thus, by minimizing extraneous cognitive load and/or increasing germane cognitive load, an appropriate arrangement of instructional features can fundamentally stimulate the construction and automation of new schemas that lead to an improved understanding of the content. By providing learners with the integrated resources that cognitive load theory predicts to be most useful in facilitating the creation of the schema required for learning, the video format is helpful in moderating the effects of the intrinsic cognitive load attributable to the inherent complexity and difficulty of the material to be learned. This implies that the content covered in the video presentations used in the current study has a high level of element interactivity, and therefore the video format may have a significant impact on reducing the cognitive load of the materials with a high level of element interactivity as acknowledged by (F. Paas, Renkl, & Sweller, 2003). These findings are coupled with findings of other studies comprising (Gerjets, Scheiter, & Cierniak, 2009). For that reason, instructional designers should keep the extraneous cognitive load at minimum levels if the intrinsic cognitive load is high. Nevertheless, if the latter is low, the former may not matter (Sweller, Ayres, & Kalyuga, 2011).

According to the cognitive load theory, the reinforcement of learning processes requires the timely provision of essential instructional guidance and the continuous elimination of unnecessary redundant information as the learner's level of expertise steadily increases. In integrated dual-modality formats, detailed direct instructional support should be provided. The findings of this study, in alignment with that reviewed by Asma and Dallel (2020) support the argument that "if learning is enhanced by an instructional design that reduces extraneous load, the development in learning may have occurred because the additional working memory capacity freed by the reduction in extraneous load has now been allocated to germane load" (Asma & Dallel, 2020). Changes in the task-specific knowledge must be dynamically tracked along with specialized instructional procedures that are adjusted accordingly. For example, as a learner gains more familiarity with the task area, unnecessary redundant support might be withdrawn to ensure that the

learners' cognitive capacity is not exceeded. Moreover, as the reduction of extraneous cognitive load is accompanied by an increase in germane cognitive load, split-attention effects may be eliminated or minimized (Kalyuga, Chandler, & Sweller, 1998; Mayer & Moreno, 2002). In turn, video format would result in a less extraneous load on working memory, which, if too high, is detrimental to learning and results in needless processing generated by instructional design. Consequently, the display of knowledge might be dynamically adapted to EFL learners' changing capacities.

Along this line, this probe corresponds to that of Rusnak (1983) corroborating that there is a straightforward interplay between the level of cognitive load and the participants' academic performance via the integration of the video format, where if the cognitive load is reduced, students' cognitive processes abilities will be increased thus improving their academic performance as evidenced by the post-test scores. Moreover, the improved academic performance of the experimental group might be attributed to the omnipresent precept of videos which allows the reduction of cognitive overload when processing information. The reviewed studies revealed conflicting results for the use of video-based learning in educational settings with some finding it valuable while others reported no noteworthy outcomes. There was, however, an agreement among researchers that video-based learning when combined with the appropriate pedagogical methods has the potential to improve the learning outcomes.

The results of the first research question added further insight to the existing literature on the incorporation of video-based learning as an effective teaching/learning tool that enhances EFL students' academic performance. It can be concluded that the integration of video-based learning has assisted EFL students to improve their academic performance in foreign language acquisition. EFL learners experienced low levels of cognitive load on the processes involved in acquiring a foreign language due to the integration of video formats. That is to say; the reduction in students' cognitive load appears to develop their academic performance in general. To recapitulate, the integration of treatment not only reduces the cognitive load of EFL learners; but has also contributed to raising the level of language acquisition and knowledge perception, and to the overall value of the academic performance of EFL learning. Findings from the NASA-TLS questionnaire, post-treatment questionnaire, and journals shall validate these findings, and

provide more insights into the impact the video-based learning had on the participants of the experimental group.

3.3.1.3 The Analysis of the NASA-TLX Questionnaire

Our participants were likely to complete the NASA-TLX questionnaire after each video watching. Before the experiment started, participants were provided with a brief description of each NASA-TLX dimension, after which they were asked to rate each dimension. The NASA-TLX subscales include questions about mental demand, physical demand, temporal demand, performance, effort, and frustration. These subscales are combined to provide a NASA-TLX workload score that ranges from 0 to 100; indicating no demand to maximum demand, respectively.

The subjective workload ratings for each subscale for the six sessions are presented in the tables below and the graphical compositions are shown in the underneath figures. The vertical axis of the figures represents the weighted ratings as the dependent measure whilst the horizontal axis shows the six workload subscales as the independent measures. In addition, the width of the subscale bar indicates the weight; the relative importance attributed to it, with the weight value at the top of the bar; the height of the bar signifies its rating. Therefore, the adjusted workload rating is the area of the subscale bar produced as the product of the weight and the rating. Consequently, the overall weighted rating for each session was calculated by multiplying by 15 the sum of the adjusted workload scores across the six subscales.

Session One

Table 3.16

NASA-TLX Data Summary for Session One

Group	Subscale	Weight	Raw Rating	Adjusted Rating (Weight x Raw)
Control Group	Mental Demand	**3**	4,31	**12,93**
	Physical Demand	**1**	1,06	**1,06**
	Temporal Demand	**4**	3,23	**12,92**
	Performance	**3**	3,31	**9,93**
	Effort	**5**	2,34	**11,7**
	Frustration	**1**	2,81	**2,81**
Experimental Group	Mental Demand	**3**	3,38	**10,14**
	Physical Demand	**1**	2,00	**2,00**
	Temporal Demand	**2**	3,28	**6,56**
	Performance	**4**	3,63	**14,52**
	Effort	**4**	2,88	**11,52**
	Frustration	**2**	2,75	**5,5**

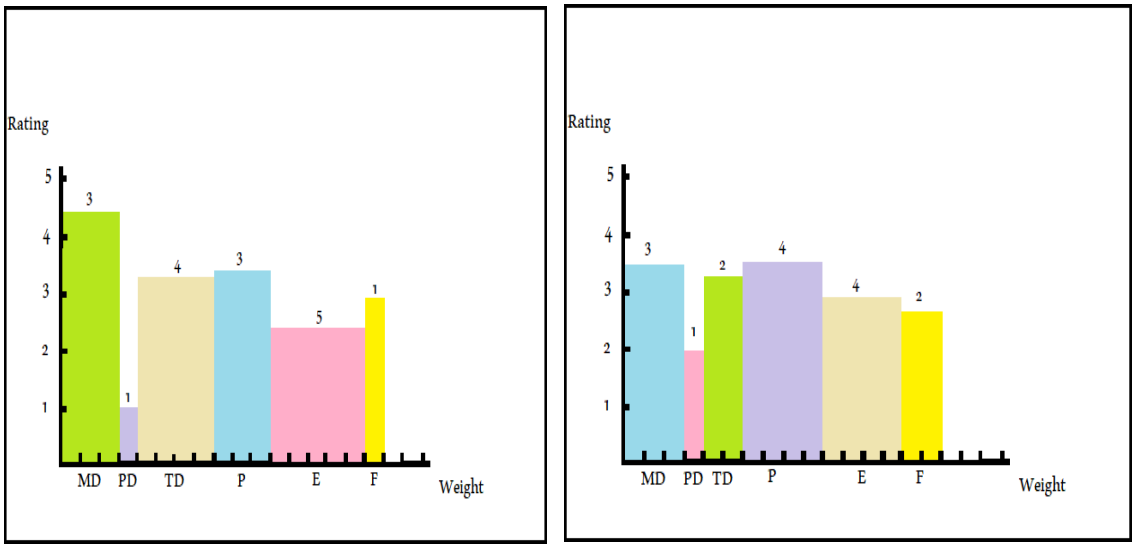

Figure 3.2 **Weighted Subscale Ratings of the Workload for Session One**

For session one, the results of the subjective ratings of workload measured by NASA-TLX are summarized above in **Table 3.16** and **Figure 3.2**. The control group recorded the highest overall mean workload score (**M = 2.83**) over the experimental group (**M = 2.5**). This entails that the control group perceived significantly higher workload then the experimental group.

Session Two

Table 3.17

NASA-TLX Data Summary for Session Two

Group	Subscale	Weight	Raw Rating	Adjusted Rating (Weight x Raw)
Control Group	Mental Demand	**2**	2,80	**5,6**
	Physical Demand	**1**	1,40	**1,4**
	Temporal Demand	**3**	2,80	**8,4**
	Performance	**3**	2,20	**6,6**
	Effort	**4**	3,60	**14,4**
	Frustration	**4**	3,60	**14,4**
Experimental Group	Mental Demand	**3**	3,44	**10,32**
	Physical Demand	**1**	1,00	**1**
	Temporal Demand	**2**	2,78	**5,56**
	Performance	**4**	2,78	**11,12**
	Effort	**3**	1,44	**4,32**
	Frustration	**1**	2,22	**2,22**

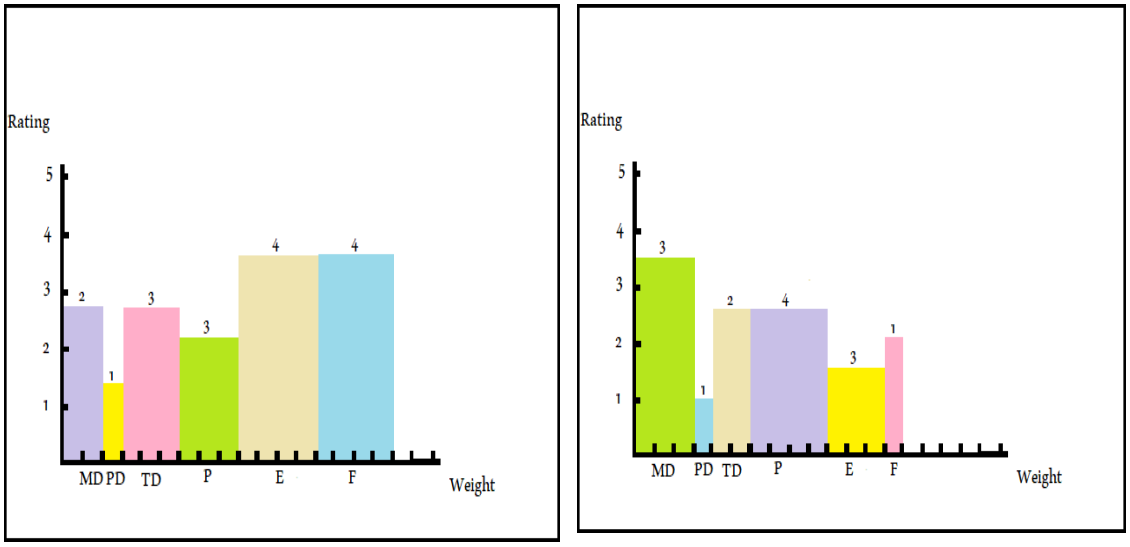

Figure 3.3 **Weighted Subscale Ratings of the Workload for Session Two**

From **Tables 3.17 and Figure 3.3**, the results of the subjective ratings of workload measured by NASA-TLX of the second session revealed that the control group overall mean workload score was (**M = 2.83**), while the experimental group overall mean workload score was (**M = 2.33**). Consequently, the experimental group perceived significantly lower workload then the control group.

Session Three

Table 3.18

NASA-TLX Data Summary for Session Three

Group	Subscale	Weight	Raw Rating	Adjusted Rating (Weight x Raw)
Control Group	Mental Demand	**4**	2,92	**11,68**
	Physical Demand	**1**	1,00	**1**
	Temporal Demand	**3**	3,26	**9,78**
	Performance	**4**	3,06	**12,24**
	Effort	**3**	3,31	**9,93**
	Frustration	**2**	3,25	**6,5**
Experimental Group	Mental Demand	**1**	2,43	**2,43**
	Physical Demand	**1**	1,00	**1**
	Temporal Demand	**1**	2,17	**2,17**
	Performance	**3**	2,29	**6,87**
	Effort	**3**	2,29	**6,87**
	Frustration	**2**	1,29	**2,58**

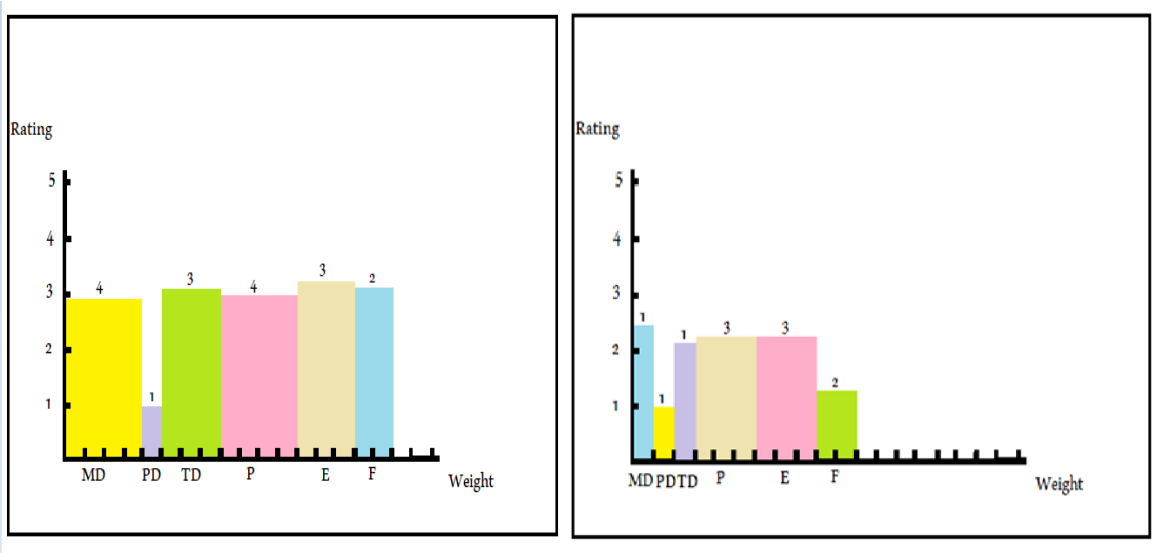

Figure 3.4 **Weighted Subscale Ratings of the Workload for Session Three**

For session three, the results of the subjective ratings of workload measured by NASA-TLX are illustrated above in **Table 3.18** and **Figure 3.4**. The control group had the highest overall mean workload score (**M = 2.83**), meanwhile the experimental group (**M = 1.83**). Therefore, the control group perceived significantly higher workload then the experimental group.

Session Four

Table 3.19

NASA-TLX Data Summary for Session Four

Group	Subscale	Weight	Raw Rating	Adjusted Rating (Weight x Raw)
Control Group	Mental Demand	**4**	4,36	**17,44**
	Physical Demand	**1**	1,00	**1**
	Temporal Demand	**1**	2,22	**2,22**
	Performance	**3**	2,72	**8,16**
	Effort	**5**	3,83	**19,15**
	Frustration	**3**	3,36	**10,08**
Experimental Group	Mental Demand	**2**	2,51	**5,02**
	Physical Demand	**1**	1,00	**1**
	Temporal Demand	**1**	1,74	**1,74**
	Performance	**3**	1,97	**5,91**
	Effort	**2**	2,00	**4**
	Frustration	**1**	1,00	**1**

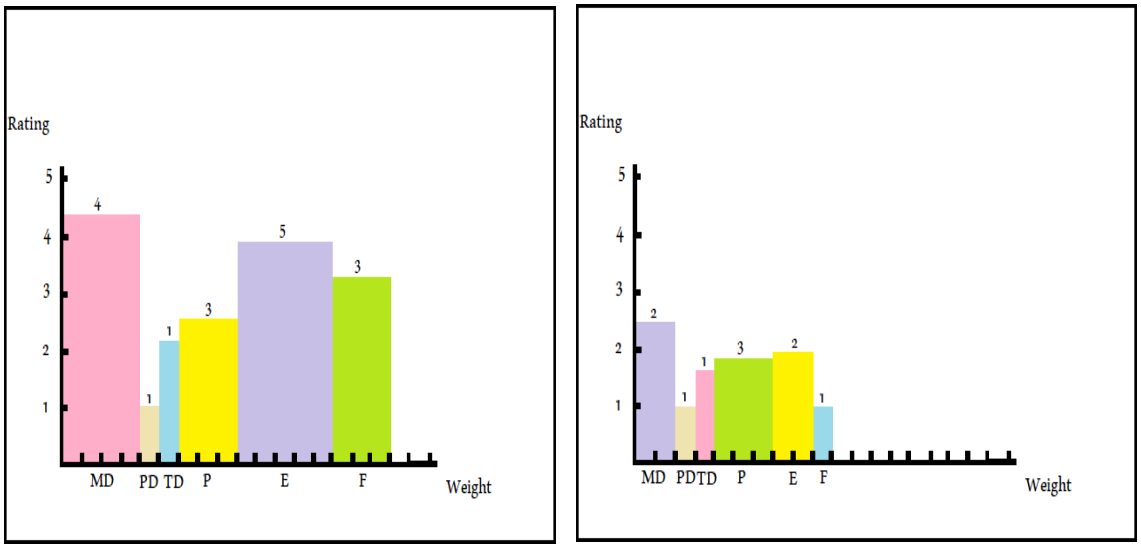

Figure 3.5 **Weighted Subscale Ratings of the Workload for Session Four**

The results of the subjective ratings of workload measured by NASA-TLX for session four are shown above in **Table 3.19 and Figure 3.5**. The overall mean workload score of the control group was (**M = 2.83**), on the other hand, the overall mean workload score of the experimental group was (**M = 1.5**). That is, the experimental group perceived significantly lower workload then the control group.

Session Five

Table 3.20

NASA-TLX Data Summary for Session Five

Group	Subscale	Weight	Raw Rating	Adjusted Rating (Weight x Raw)
Control Group	Mental Demand	**4**	4,62	**18,48**
	Physical Demand	**1**	1,00	**1**
	Temporal Demand	**2**	2,50	**5**
	Performance	**3**	2,38	**7,14**
	Effort	**5**	3,76	**18,8**
	Frustration	**3**	3,00	**9**
Experimental Group	Mental Demand	**3**	2,28	**6,84**
	Physical Demand	**1**	1,00	**1**
	Temporal Demand	**1**	2,36	**2,36**
	Performance	**3**	2,28	**6,84**
	Effort	**2**	2,72	**5,44**
	Frustration	**1**	1,00	**1**

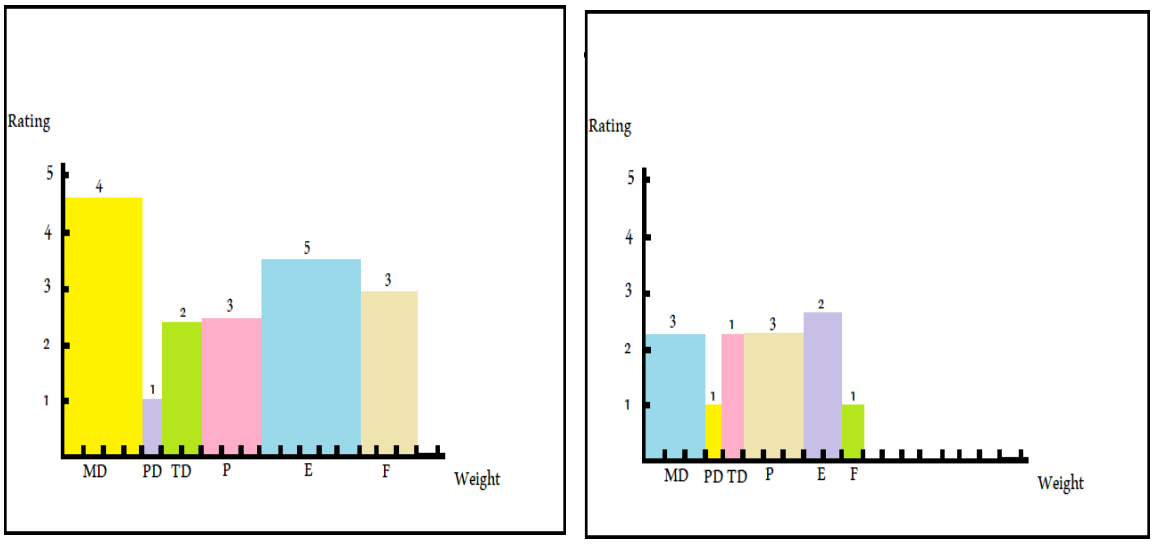

Figure 3.6 **Weighted Subscale Ratings of the Workload for Session Five**

For session five, the results of the subjective ratings of workload measured by NASA-TLX are summarized in **Table 3.20** and **Figure 3.6** above. The control group recorded the highest overall mean workload score (**M = 3.00**) over the experimental group (**M = 1.67**). This entails that the control group perceived significantly higher workload then the experimental group.

Session Six

Table 3.21

NASA-TLX Data Summary for Session Six

Group	Subscale	Weight	Raw Rating	Adjusted Rating (Weight x Raw)
Control Group	Mental Demand	**3**	3,38	**10,14**
	Physical Demand	**1**	1,69	**1,69**
	Temporal Demand	**2**	2,81	**5,62**
	Performance	**5**	4,31	**21,55**
	Effort	**4**	2,62	**10,48**
	Frustration	**3**	2,00	**6**
Experimental Group	Mental Demand	**2**	2,56	**5,12**
	Physical Demand	**1**	2,44	**2,44**
	Temporal Demand	**1**	2,56	**2,56**
	Performance	**3**	3,00	**9**
	Effort	**3**	3,22	**9,66**
	Frustration	**1**	2,12	**2,12**

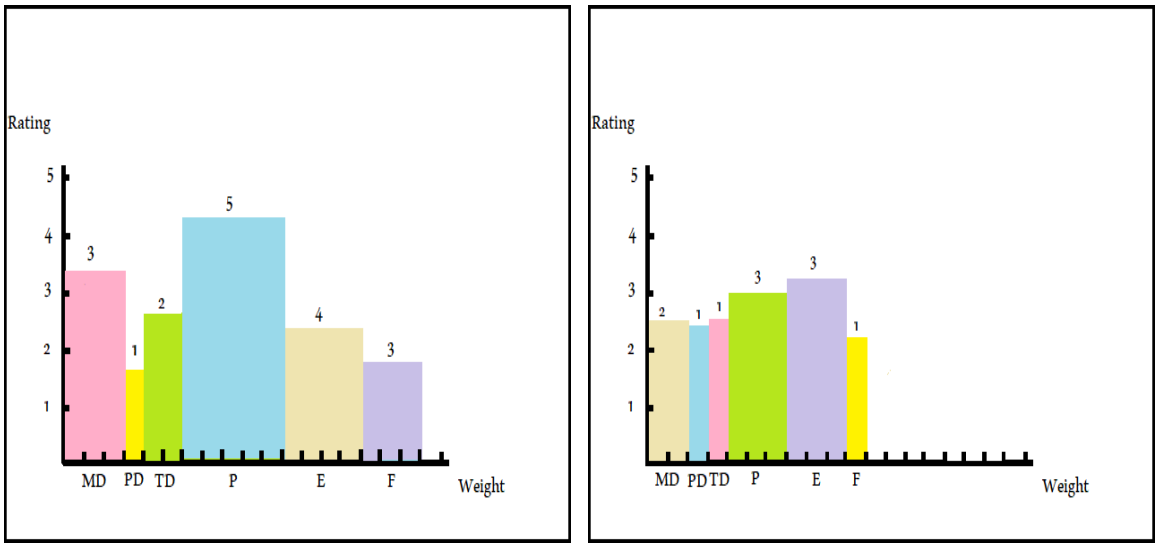

Figure 3.7 **Weighted Subscale Ratings of the Workload for Session Six**

From **Tables 3.21 and Figure 3.7**, the results of the last session of the subjective ratings of workload measured by NASA-TLX exposed that the control group overall mean workload score was (**M = 2.67**), while the experimental group overall mean workload score was (**M = 1.67**). Accordingly, the experimental group perceived significantly lower workload then the control group.

3.3.1.4 The Discussion of the NASA-TLS Questionnaire Findings

In this part, the interpretation of the NASA-TLX questionnaire outcomes is pertinent to the interpretation of the aforementioned findings of the post-test experimental data. With regard to answering the second research question; *How would watching videos influence the cognitive load of EFL learners?* The findings of the NASA-TLX questionnaire are synthesized allowing hence a better discerning of convergences and divergences between the experimental group and the control group. Moreover, in compliance with the interpretation of the NASA-TLX questionnaire, descriptive results about the students' mental demands in accordance with their mental effort were demonstrated.

The differences in viewpoints, between the intervention group and control group, could then be attributed to the treatment conducted with the experimental group. The first research question investigated the extent to which video-based learning affects EFL students' cognitive load, the post-test findings indicated positive outcomes about the effects of video-based learning on the cognitive load of EFL students across the experimental group; yet, the researcher opts for the NASA-TLX questionnaire to unveil the effectiveness of using videos and their influence in reducing the cognitive overload of EFL students.

The results of the second research question worked towards the confirmation of the first hypothesis. Students in the control group and the experimental group were assigned to assess their perceived mental effort, task difficulty, and engagement through the NASA-TLX questionnaire; a subjective self-reported rating scale. The hypothesis was tested by comparing participants' scores of the control and experimental group on the mental efforts they employed to complete a task; after the quasi-experiment was completed. This will provide an indication of the level of mental effort experienced by the students, as well as their fatigue and frustrations.

The NASA-TLX questionnaire was carried out with all the participants; from both the experimental and control groups. Six items of Likert-type rating scales were used for cognitive load measurement. Question item stems were compared according to six different cognitive load measures; mental demand, physical demand, temporal demand, performance, effort, and frustration level. After answering the post-test, students were

asked to rate how much mental effort they used to answer it. Responses varied from “Very Low” to “Very High“.

All previous studies existing in the literature stockpile were conducted in a purely descriptive manner as no involvement was deployed as an attempt to trim down the cognitive overload of EFL students by integrating video-based learning. In the concurrent examination, members of the experimental group have undergone six video-based learning presentations treatment. Thence, the numerical data indicated that the participants of the experimental group showed a low level of cognitive effort. The significant reduction in the cognitive overload of the experimental group, compared to the control group, was plausibly attributed to the integration of videos treatment that participants in the experimental group have experienced in contrast to those in the control group.

In fact, a number of requirements have to be fulfilled for self-reported mental effort during learning to be considered as a valid measure of cognitive load. To begin with, video presentations that enclose redundant texts as well as narrations tend to assist students to rate their mental effort better than non-redundant presentations that enclose animation and narration only. Then, students rate their mental effort much better on the more complicated high-complexity points in the presentation than on simpler low-complexity points in the lesson. Following, when it comes to transfer, students with low scores generally rate their mental effort better than those with high scores. To put it differently, greater effort may indicate more germane processing, which should result in higher transfer test scores.

The utilization of audio and visual human channels for the perception of information support video presentation, which also allows for effective structuring and organization of perception. This is crucial when it comes to teaching foreign or second languages like English. Video presentations permit EFL students to demonstrate the teaching/learning subject of their studies in real-life situations. Taken as a whole, this is consistent with some empirical investigations and theoretical frameworks, such as that of (Pisarenko & Krasnoshchekova, 2016). In fact, video resources permit exhibition not only a foreign language but also the entire context in which it exists, such as social factors, cultural factors, historical factors, and others. It is now plausible to contend that low levels of cognitive overload experienced by EFL students in the experimental group differed considerably from their counterparts in the control group due to the integration of videos. Compared to the later, the former felt less overloaded.

As a result, the implementation of verbal inputs and visual imagery seems to increase memory, thus allowing EFL students in the experimental group to outperform members of the control group both in the post-test as well as in the NASA-TLX questionnaire. In other words, the examination of the students' cognitive load under the experimental circumstances of this research reveals that those in the intervention group had lower cognitive load rates than those in the control group. This implies that when EFL students are exposed to authentic foreign language content in the form of videos, the dual-code display model decreases their cognitive load. Therefore, learning a foreign language like English will be more beneficial with the dual-code display model. That is to say, in a multimedia language learning environment, students can learn effectively by employing two codes rather than simply one. Similarly, in the context of this study, this finding lends credence to what the dual coding theory has revealed (Clark & Paivio, 1991; Plass, Chun, Mayer, & Leutner, 1998; Schmidt-Weigand & Scheiter, 2011; Thomas & McKay, 2010). These findings, interestingly, are in sharp contrast with the previous studies conducted by (Acha, 2009; Plass, Chun, Mayer, & Leutner, 2003), who indicated that surplus information in a multimedia format can inflict excess anxiety and pressure on low-level both visual and verbal students.

3.3.2 Analysis of Qualitative Data

As mentioned beforehand in the methodology chapter, reflective journals were not the primary source of data as is the case with the tests and questionnaires. Instead, teacher's reflective journals were conducted to provide supportive and detailed qualitative data about teachers' attitudes and perceptions towards video-based learning.

3.3.2.1 Analysis of the Reflective Journals

Journals have been carried out with both groups from the first session of the experiment. The journals were held by the researcher herself through notes taking. Then, it was written in detail at the end of each session so as to render exhaustive information about the session's procedures. The areas covered in the checklist were adapted for two reasons; first, it gives coherent and structured data. i.e. the raw data are broken down into specific categories and related themes in a more objective way so that the interpretations and results are more valid. Second, these areas facilitate systematic analysis; therefore, the co-researcher could narrow down the data into criteria to be examined in terms of codes. The

later were condensed into fewer criteria so that the main themes emerged. Twelve reflective journals were gathered; six versions belong to the experimental group and six belong to the control group. The analysis was performed by a co-researcher who was not informed which group each journal belonged to in order to compel a creative and conceptual analysis and interpretations. Hence, after repeated and attentive reading, the co-researcher meticulously analyzed the journals in accordance with the areas included in the checklist (cf. appendix O).

The findings of the analysis of qualitative data obtained from the reflective journals confirm and back up the results of the post-test, NASA-TLX questionnaire, and post-treatment questionnaire. Journals were conducted with both groups from the beginning of the experiment in order to provide more insights into how the experiment affected them. The purpose of this section is to report the results of the reflective journals' analysis, thereby answering the fourth research question.

- ***The Video and its Relation to the Lesson Objectives***

Whether in a video-based class or non-video lecture, the objectives set by the teacher were alike. The major purpose is to integrate stimulus and prompts for students in order to engage them in the cognitive tasks required to process information as well as to engage them in active learning. Accordingly, this would assist them to develop mental models in order to shift video-based learning from passive learning to active learning. The researcher's reflective journals suggest that videos might improve students' learning through a variety of processes; optimizing cognitive load by reducing extraneous load and increasing germane load as well as strengthening their memory and their capacity to use the recalled information.

The main goal of Listening and Speaking sessions is to improve the necessary listening skills so that students can track and understand discourse such as conversations, lectures, discussions, and interviews. Further, after completing the academic courses at the university level, students will develop appropriate speaking skills in order to communicate efficiently. Yet, the objectives may differ from one session to another; the following are instances of the most prominent objectives that the teacher went for:

- Students will be able to identify the main ideas.

- Students will be able to specify basic details.
- Students will learn how to use strategies for active listening.
- Students will learn how to take clear notes.
- Students will organize their ideas using their notes.
- Students will become familiar with words and phrases related to the topic.
- Students will be able to draw conclusions based on the context.
- Students will be able to express themselves fluently.
- Students will be able to express themselves accurately.
- Students will be able to convey their ides.
- Students will be able to participate in discussions.

➢ ***Content of the Video***

With regard to the content of the videos, the researcher asserted that factors such as the duration of the video, the extent of interaction and boredom, the clarity and relevancy of the video, and the students' appropriateness level were all considered. The researcher attempted to ensure that both groups get the same content, whether through the use of videos or not, by considering the lesson objectives. First and foremost, the teacher used videos to teach a range of language components that were sometimes hard to be taught; she said, "*I believe that it is sometimes difficult to teach English pronunciation or speaking skills; nevertheless, video implementation aid to teach these language components"*. With that being said, because English language teachers in Algeria are not native speakers, they need certain reliable sources while teaching pronunciation; for example, videos are one way to solve that problem. Thus, the same principle applies to other subjects, mainly listening, reading, and vocabulary.

Moreover, the researcher confirmed that some courses, such as listening and reading comprehension are based on pragmatic interpretations that necessitate the use of body language, facial expressions, and gestures. Through this experience, video provides students with these features more than the written materials (those used with the control group). Therefore, explaining an idea is much easier through video use. In terms of listening skills and through the informal discussions made with students, they claimed that watching videos could provide them with a variety of situations which helps them understand and learn what to say in each situation. On the one hand, students believe that when they watch and listen at the same time, they can learn correct pronunciation, the

native dialect and accent, intonation, and other aspects of listening. The teacher, on the other hand, believes that watching videos is the main source that contributes to improving students' listening skills.

Another important issue for maximizing students' attention in video content is to keep it short. The researcher, for instance, asserts "*since the length of the video is short, the video environment was interesting and interactive*." The researcher observed that students tend to watch the entire video if it is short, and if the video is longer than 7 minutes, students will start to get bored and thus likely waste the effort. Another issue with keeping students engaged in watching the video is to utilize a relevant conversational style rather than formal language. The teacher emphasized that having an impact on students' learning requires a conversational style that encourages students to form a sense of social relationship with the reporter which leads to increased engagement and effort.

- ***Students' Engagement***

Student engagement is another lens through which educational videos can be evaluated. The researcher stressed that the experimental group was more engaged and motivated in fulfilling the assignments compared to the control group because students were attracted to videos that were integrated into their learning process. According to the researcher "*teaching students using videos makes the classroom more productive and effective*". She further explains that "*after watching the video, students were more likely to participate in the classroom activities*".

After several meticulous observations and informal discussions with students, they consider the use of video materials as a kind of extrinsic motivation in the sense that they require a sort of external stimulus to learn English. Likewise, they approved that they enjoyed learning the target culture through watching videos and considered it as an advantageous learning experience. "*It is hard to pay attention, especially if it is a long session of sixty or ninety minutes … we need the teacher to use different methods and techniques to break up the boredom like the videos she used*", one student asserts. As a final point, referring to the findings of the other research tools, it appears that videos could help students develop their academic language abilities. This improvement is likely due to the shift in their learning attitudes and self-confidence.

- ***Students' understanding***

While conducting reflective journals, the teacher assures that videos could facilitate the process of teaching and learning; though, this claim was somewhat less valid with the control group. The researcher considered the use of video materials as a helpful tool that assists her in presenting and explaining various topics and ideas comfortably. In addition, in her journals, the teacher mentioned that when students watch and listen to native speakers at the same time, they could acquire not only pronunciation but also understanding the meaning of words. This benefit can be traced back to the potent receptivity that may be connected to the ease with which visual accompaniment facilitates auditory processing. Video could fill in gaps in aural comprehension which lowers affect and empowers the language student at the same time. Moreover, videos are often regarded as being comprehensible, salient, and effective than other forms of media for foreign language students.

Students, conversely, indicated that the videos they were exposed to enabled them to get a better, deeper, and easier understanding of the topics along with aiding them to recall information effortlessly and making learning easier and better. For other students, videos could provide them with better knowledge of the topics and issues related to certain areas. For these students, videos offered the advantage of enabling a deeper comprehension.

Below are some instances of students' claims about the use of videos:

One student pointed out, "*videos help me understand and grasp the topic being taught in detail*".

"*Videos make learning much easier. Sometimes, I might be tired or unable to focus, but when a video is used, I can eagerly watch and concentrate*", another student commented.

Another student added, "*Video helps me to understand whatever is being taught much better*."

- ***Advantages of the Video***

Based on her reflective journals, the researcher emphasized that "*the implementation of videos have numerous advantages, such as creating motivation, providing diversity,*

exposing students to native speakers and certain cultural elements of the English language, and most importantly, boosting students' oral communication skills". Another advantage of videos is that it has the ability to reduce language learning anxiety among students while giving them more opportunities to communicate. Hence, allowing more interactions between them and the teacher. Additionally, the teacher argues that "*videos could enhance general knowledge and raise the awareness about native speakers; besides, students were able to better retain cultural knowledge*." Most notably, videos could assist students in the process of remembering and recalling information, as evidenced by their responses to the post-test.

According to her reflective journals on the advantages of integrating videos into language classes, the researcher noted:

- Videos could allow students to simultaneously acquire new information by means of various perceptual modalities.
- Videos could grab the students' interest and attention; hence, their motivation.
- Videos could enrich target language acquisition for its directedness and salience.
- Videos could assist in the detection of supra-segmental aspects, such as stress, rhythm, and intonation, as well as how they affect information and meaning.
- Videos could assist in the recognition of phonetic combinations and restrictions.
- Videos could assist in understanding the relationship between sentences and their functions in different contexts.
- Videos could assist in inferring meaning, making predictions, and calling up prior knowledge of the topic.

➢ ***Teacher's and students' interactions***

The following addressed element has to do with teacher-student interaction; in other words, teacher-student roles within a video-based classroom and a non-video-based classroom. On the one hand, as in many English language teaching situations, the researcher plays a critical role in the use of videos as a language teaching aid for she is responsible for ensuring that videos are used to create a successful language learning environment. The researcher points out that "*the use of videos was considered as a medium that facilitates the language teaching/learning process*". In a video-based classroom, the teacher was as effective as the video as she is the only person who enables the students to understand what they see and hear through employing basic communicative techniques.

Accordingly, the experimental group was more involved and engaged than the control group because videos made foreign language learning attractive.

Similarly, in the video-based classroom, the teacher claimed that she was a controller, an organizer, an assessor, a prompter, and a participant. In combination, these roles have the potential to increases teacher-student interactions.

- A controller because she is the only one who can control what students do and say while and after they watch the video.
- An organizer because she gives clear instructions and useful information to students so that they do not waste time. She also clearly explains the task and what will be displayed in the video.
- An assessor because she assesses students' outputs at the end of the task in order to see how well they performed.
- A prompter because she encourages students' participation.
- A participant because she takes part in the tasks while teaching which makes the students feel at ease.

Lastly, the teacher declares that the use of video-based learning could to some extent accelerate a shift in language learning and teaching from teacher-centered to learner-centered approaches. Trying to satisfy the demands of digitally full-fledged students, she adopted different roles rather than the typical bench-bound teaching roles. Thus, this transition affects positively teacher-students interaction of the experimental group at the expense of the control group.

- ***Attitudes of Teacher and Students***

As far as attitudes of the teacher and students are concerned, the researcher reported that the experimental group holds positive attitudes towards video-based learning presentations. Nevertheless, the control group had the same attitudes just as with any traditional teaching method. In other words, since students' response to videos as an instructional tool has been positive, it is partially attributed to their positive attitudes toward the medium to which they were predisposed.

Through their informal talk with the teacher, students were asked if videos affected the approach to learning in any way, as compared to non-video lectures, students'

responses to their attitudes towards videos were generally favorable. Their behaviors revealed that their attitudes were shaped by the perceived relevance of the lecture and course content, as well as their understanding of how videos could add value to the content, rather than replacing content. According to the researcher, videos changed students' learning approach by making the entire learning process compatible. A student reported, "*videos helped me learn more easily because I enjoy watching. Instead of trying to comprehend or write everything in the classroom, videos made it easier for me to grasp whatever was taught.*"

- ***Teacher's and student's satisfaction***

Through her journal's writing, the teacher claimed that the students had positive perceptions towards video integration; their perceptions were evident in their responses to the post-treatment questionnaire. For them, the videos were useful, helpful, innovative, and relevant as well as they could add a new perspective to the content. That is, students were satisfied with the implementation of videos. Also, when asked whether they enjoy learning through videos, all participants in the experimental group revealed their positive feelings toward it.

The following are some instances of the participants' responses:

One of the students affirms, "*I think it is really satisfying* because I have not lost interest and concentration in class".

According to another student "*I loved the atmosphere while watching the video because I was less anxious compared to the normal classes and it felt like a movie; that was fabulous*".

For another student, "*video attracted me to such a method of learning English that I was in a position to break up with traditional teaching methods*".

- ***Occurring Problems***

While the various positive aspects of video integrations have been previously reported, the researcher claims that there were some noteworthy occurring problems and some negative aspects related to video implementations. First and foremost, the minority of

students perceived videos negatively. That is to say, some students; naturally, may not be interested or enthusiastic about watching videos. One student stated: "*I am not really excited about videos in general. I usually fall asleep when watching videos so I don't appreciate it. Rather, I would prefer to read than to watch a video*." Likewise, one of the obstacles that hinder the teacher's integration of videos is the unavailability of the necessary materials, such as overhead projector, loudspeaker, etc which made it compulsory for the teacher to afford them by herself and from her own proper money. As a final point, the researcher reported that the integration of videos into their classes required much more time and effort compared to regular classes which do not use videos.

For more concretization, the following table represents the researcher's reflective journals about the integration of video-based learning by means of the analyst's analysis:

Table 3.21

Summarized Data of the Teacher's Reflective Journals

Criteria	**Summarized data of the Reflective Journals**	
	Experimental Group	**Control Group**
Criteria 01: The video and its relation to the lesson objectives.	**Appropriate**	**Appropriate**
Criteria 02: the Content (clear, relevant, suitable to students' level, etc).	**More Appropriate**	**Appropriate**
Criteria 03: Students' engagement.	**More Appropriate**	**Less Appropriate**
Criteria 04: Students' understanding.	**More Appropriate**	**Appropriate**
Criteria 05: Advantages of the video.	**Appropriate**	**Less Appropriate**
Criteria 06: Teacher's and students' interactions.	**Appropriate**	**Less Appropriate**
Criteria 07: Teacher's and students' attitudes.	**More Appropriate**	**Less Appropriate**
Criteria 08: Teacher's and student's satisfaction.	**Appropriate**	**Less appropriate**
Criteria 09: Occurring Problems	**Inappropriate**	**Inappropriate**

3.3.2.2 Discussion of Reflective Journals Findings

The endeavor to define teachers' perceptions and attitudes towards video-based learning as well as to crosscheck statistical findings is contingent upon the results obtained from qualitative findings. The teacher was motivated to journaling about the experiment, and this had significantly affected the quality of the data collected. Qualitative data contributed to addressing the fourth research question of this study related to the perceptions of the teacher regarding the effect of video-based learning intervention on students' cognitive load. Findings from the teacher's reflective journal provided rich insights into the impact of the experiment on participants. Some of the findings corroborated the quantitative ones; while others offer new horizons and perspectives. A variety of different study methods; including quantitative tests and questionnaires, and qualitative journals, have shown benefit in validating the effectiveness of video-based learning for EFL teaching/learning, and secondly, gaining knowledge of the teacher's and students' perceptions on the use of such an intervention. With the aim of trying to confirm the usefulness of video-based learning for EFL teaching and from teachers' perspective, the researcher decided on teacher's reflective journal; hence, she could maintain reflections on her teaching using videos and their effect on students' cognitive load. The teacher could record her teaching, see what the students did in the classroom, think about it, and reflect on their performance.

The successful implementation of technology depends primarily on the attitudes of teachers who ultimately decide how to implement it in the classroom. It is important for teachers to possess positive attitudes as it has been found to be linked to use and intention to use. In other words, attitudes are the variable that determines successful technology integration in education; whether positive or negative, attitudes affect how teachers respond to technology in an educational setting or learning environment. The qualitative data of the current research revealed that the teacher had positive attitudes towards the use of technology as a teaching tool. Similarly, in the context of this study, this finding lends support to what (Brandl, 2002; Ruthven, Hennessy, & Deaney, 2005) studies have revealed. Furthermore, teachers' readiness and willingness to incorporate technology has a greater influence than any other aspect. The results of this study, thus, correspond to the findings in the literature review, researchers point out that in order to change educational practices, technology implementers must believe in the impact on students learning and on

the classroom (Ertmer, 2005; Inan & Lowther, 2010; Lim & Chai, 2008; Van Braak, 2001). In this regard, positive attitudes of teachers serve a critical role in the application of new technologies into educational settings since use and attitudes would be closely intertwined. In connection therewith, these accounts were mated with those of (Foley & Ojeda, 2008) who postulated that teachers have favorable attitudes and their use will be widely increased in the near future.

Teachers' attitudes toward the use of technology can vary from extremely positive to extremely negative depending on the combination of different factors. Via these factors, human nature influences the change of acquired and non-inherited characteristics of a person which has the potential to change the attitudes of teachers. Accordingly, the obtained results seem to lend support to what Mumtaz (2000) study has revealed. Accordingly, teaches' attitudes toward technology use, whether positive or negative, affect not only how teachers respond to technology in an educational setting, but also the experiences of the students who teach them. This, in turn, impacts the academic motivation of students and their response to technology use. In view of technology use, the finding of this study corroborates the work of such studies as Huang and Liaw (2005) who argue that despite the increasing level of technology use in educational settings, the extent to which it can be improved as well as the effectiveness of students' learning would therefore largely depend on the attitudes of teachers and their willingness to embrace technology.

The findings imply that students were able to learn by watching video exposure as far as reducing cognitive overload was concerned. The teacher believes that integrating video materials into EFL classes facilitates teaching and learning processes. As the intent of using video materials in the classroom is to provide a variety of materials, the teacher considers the use of video presentations as supplementary material that is significant to sustain and facilitate the process of teaching and learning than relying on other materials such as textbooks or handouts. The idea of providing a range of resources is crucial, especially in EFL classes as it avoids the risk of the class being a dry environment that fails to motivate students. More importantly, and from the teacher's standpoint, the use of video presentations as a supplemental resource has an important role in meeting EFL students' interests and needs. Satisfying students' needs and interests are the major reason for using videos as supplementary materials as well as it constitutes the indispensable element in the

whole progression of course design that leads to an effective teaching and learning process; these findings are in line with (Richards, 2007).

In general, using videos is very beneficial in teaching and in EFL classes in particular. When used along with other types of materials, the teacher considers video materials to bring variation, engagement, motivation, and encouragement to EFL students. First, video materials could be a useful technique for increasing students' engagement while watching a relevant well-planned video. It has an appositive effect on students' engagement by stimulating them to get involved in classroom activities and discussion about a particular topic from the video they watch. These findings are exceedingly affiliated with that of (Schmid, 2011) who has proven that success in any sort of human learning is due to the fact that a learner is motivated to accomplish a target. Utilizing video presentations in EFL classes is beneficial for students in the sense that it facilitates learning and motivates students to learn both visually and audibly. Despite not being easily evident, an EFL student's motivation, noticing, attention, affective states, and attitudes have been a major topic in EFL research. Video materials are one of the resources that influence students' motivation as far as the degree to which students' effort to learn English, their actions, behaviors, and orientations are concerned. Hence, motivated students are those who seem to seek out opportunities to learn.

Another outcome from the teacher's journal considers videos as an effective technique that confirms that video materials help out to stimulate and encourage students to participate in the set of classroom activities. Since video exposure is a rich source of FL input as well as for the English language, it seems to tempt the atmosphere that students usually experience through leisure activities, accordingly, lowering the levels of FL classroom anxiety and increasing the feelings of positive excitement, pleasure, motivation, and enjoyment for English learning. Along this line, this probe corresponds to those of (Borrás & Lafayette, 1994; Kuppens, 2010) corroborating at the valuable effects of videos on the low affective filter of FL learners, worry-free learning environment, and learners' immersion in FL stimulus. All these studies authenticate that the integration of videos give students the opportunity to learn English in a relaxed and comfortable atmosphere.

In addition to the benefits of video materials already mentioned, the teacher shows a great tendency towards the use of videos in their classroom as a pedagogical tool for improving students' listening skills. Accordingly, EFL teachers can integrate video

materials for teaching a variety of topics. This implies that videos allow the brain to encode two different forms of information simultaneously; visual and auditory stimuli. In fact, the human memory has two largely separate subcomponents; visual and verbal which function in parallel, i.e. simultaneous processing of information received from learners' eyes and ears. These findings were coupled with that conducted by Jones (2003) who ascertained that the use of verbal and visual aids improves listening comprehension because learners are better able to recall knowledge when they are accompanied by verbal and visual illustrations. In this way, teachers can take advantage of all subjects for the improvement and reinforcement of oral communication.

In the same vein, the teacher indicates that the intervention employed in this investigation could have a significant facilitating effect on vocabulary acquisition. In contrast to the expected traditional static lecture format, videos seem to offer students the ability to conveniently store information in long-term memory so that boosting retention of information. The effects of the video exposure; likewise, appear to be long-lasting enough to provide immediate and explicit acquisition of FL as well as appropriate enrichment of already existing knowledge, the finding of this study is equally certified by (Dörnyei, 2009). As a consequence, video incorporation could support EFL students to develop their language; thus, their achievement; if the teacher uses the relevant material appropriately in a way that stimulates the students' motivation.

The research also demonstrated the importance of adequate design and presentation of multimedia teaching materials. Different settings for using video content as supplementary material in teaching showed that better effectiveness is achieved if the educational content congruent with the lecture has been displayed. This implies that the teacher has a critical role in designing video materials and incorporating them in accordance with the type of topic and subject. Another key point to highlight is that the teacher must be aware that there are certain issues to consider when using video materials. These issues include students' contextual culture, language proficiency level, age, interest, and needs. Besides, the teacher has to consider; first, students' goals; and second, the course learning objectives, and not to use videos for the purpose of coloring the lesson. Teachers need to make decisions and options in order to deliver materials that align with the goals and objectives of the course and serves to satisfy students' needs and interests. Taken as a whole, the findings are consistent with some empirical studies and theoretical

frameworks. Graves and Xu (2000) study for instance has also proven that teachers ought to be vigilant about the video materials they are incorporating while preparation; they have to clarify their choices apropos to the efficacy of videos in EFL classes and to consider them as a useful technique that should be used carefully and in a well-organized and planned manner.

It might be safe to claim that, teachers' perspectives towards video-based learning presentations on lessening cognitive overload were favorable. First, video-based learning presentations have certainly stimulated in the students an indisputable sense of improvement which is considered as a fundamental motivational issue in EFL learning. Additionally, EFL students are more likely to foresee substantial acquisition gains than from a single modality constituent. This research examination provides an efficient empirical confirmation that video-based learning presentations with such a treatment case endorse EFL learning without exerting cognitive efforts. To sum up everything that has been stated so far, the study provides exclusive empirical confirmation for the exact purpose of the effectiveness of the video presentations to reduce extraneous cognitive overload during EFL learning. This actively demonstrates that the way information is presented in the video format abated cognitive overload, therefore leaving sufficient resources available for students to process the germane; schema-related load, i.e. redirecting^ùùmpwq students' attention towards increasing germane cognitive load which was the aim of the current research study.

3.4 Analysis of the Post Experimental Phase Findings

In this section, the analysis of the post experimental phase findings, the researcher opts for the analysis of the post treatment questionnaire and its discussion.

3.4.1 Analysis of the Post-Treatment Questionnaire

The questionnaire covered three major areas related to video-based learning and its effects on cognitive load. The first section explores students' perceptions regarding watching educational videos. The following section is about the students' attitudes towards video-based learning and lecturing. The last section is about students' perceptions of their cognitive load during watching educational videos. In addition, the demographic characteristics of participants were deemed significant to be analyzed. These

characteristics encompass the gender, years of studying English in university, whether they watch videos, what kind (s) of videos they watch, whether they used to be taught through videos, and if they enjoy learning through videos. A detailed analysis is portrayed below after being presented in tables and graphs, but preceding that, significant calculations of the scales' validity and reliability are indicated infra.

3.4.1.1 Questionnaire Reliability

A consistency test is generally reported through the calculation of the estimated reliability coefficient "Cronbach Alpha". The latter can be as low as a zero for an unreliable test or as high as **+1** for a perfectly reliable one. A highly reliable test coefficient ranges approximately between **0.7** and **0.9**. The stability of scores of this questionnaire over time was statistically measured. The Cronbach Alpha is computed via SPSS which is shown in the table infra:

Table 3.22

Cronbach Alpha Reliability

Cronbach's Alpha	Frequency
0.896	**5**

Table 3.22 above displays the measurement of Cronbach Alpha that was **0.896**. It is justified to state at this stage that students' questionnaire performed a high level of reliability. By means of the consistency test, the stability of the scores over time was considered consistent and stable.

3.4.1.2 Demographic Information

The succeeding section exhibits data analysis of the demographic information of the experimental group in terms of gender, years of studying English, if they watch videos, what kind (s) of videos they watch, if they used to be taught through videos, and if they enjoy learning through videos. This section was added to ensure the sample's homogeneity.

Gender

The following graph demonstrates gender percentages of the participants (experimental group):

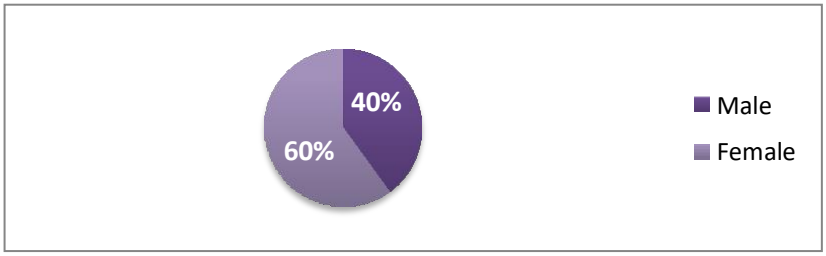

Figure 3.8 **Participants' Gender**

As it is clearly illuminated from **Figure 3.8**, the distribution of gender is manifested under two categories with the overwhelming percentage of females **(60%)** and males **(40%)**; which is the case of the general characteristics of Algerian university students.

English Learning Experience at the University

Figure 3.9 displays the descriptive statistics of the learning experience of English at the University of the experimental group.

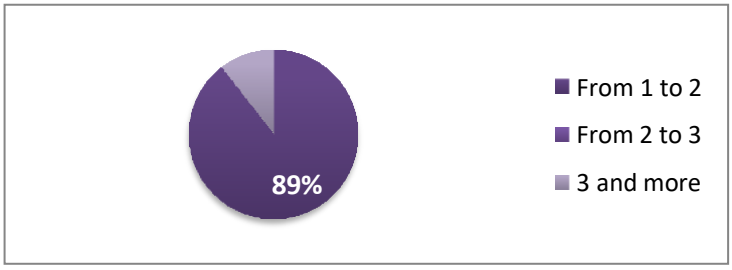

Figure 3.9 **English Learning Experience at the University**

As illustrated in **Figure 3.3,** it is apparently shown that the participants' learning experience of English in higher education is ranged from one to three years and more. A bulk of (**89.5%)** was exposed to a learning experience of English under the wings of one year, whereas the minority of (**10.5%)** experienced three years of learning. As a result, group equivalence is safeguarded to some extent.

Watching English Videos

The subsequent figure exhibits the descriptive statistics concerning the targeted participants; whether they used to watch English videos or no?

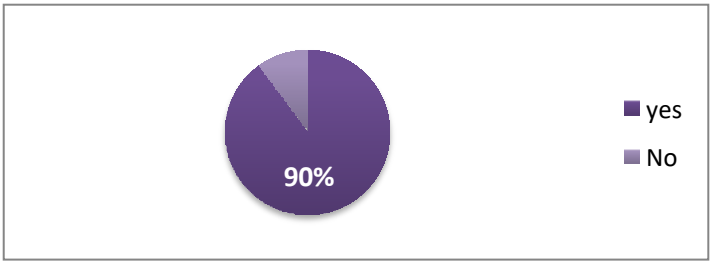

Figure 3.10 **Watching English Videos**

The abovementioned **Figure 3.10** exhibits that (**90%)** of the respondents do watch English videos and that only (**10%)** denied watching English videos; yet, they watch other kinds of videos. These descriptive statistics safeguard the validity of the respondents' responses to the following sections.

Kinds of Videos

Figure 3.5 shows the percentages of the types of videos that respondents used to watch.

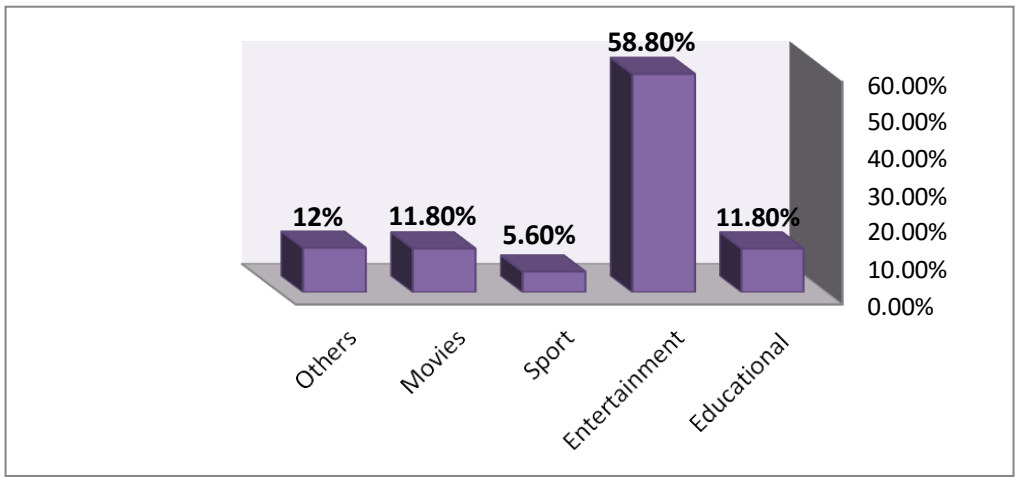

Figure 3.11 **Kinds of Videos**

What can be clearly revealed from **Figure 3.5** is the fact that the majority of respondents, that is over (**58%),** watch entertainment videos. However, only **(11.8%)** of the participants watch English educational videos which are the concern of the current

investigation. And **(11.8%)** watch movies/series, followed by **(6%)** for sport videos while (**12%)** claimed that they watch other types of videos such as games, meme… etc.

Learning through Videos

Figure 3.6 illuminates descriptive statistics for the use of videos in EFL classes.

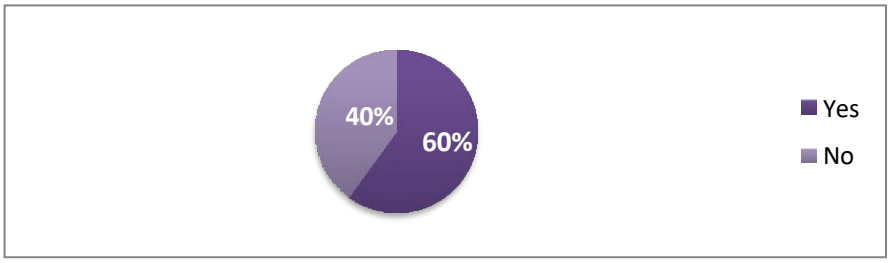

Figure 3.12 **Learning Through Videos**

From **Figure 3.12**, it is apparently elucidated that while **(60%)** of participants reported that their teachers use videos as a teaching resource, **(40%)** declare the reverse.

Learners' Perceptions towards Watching Videos

Figure 3.13 demonstrates the descriptive statistics of the respondents' perceptions towards watching English videos.

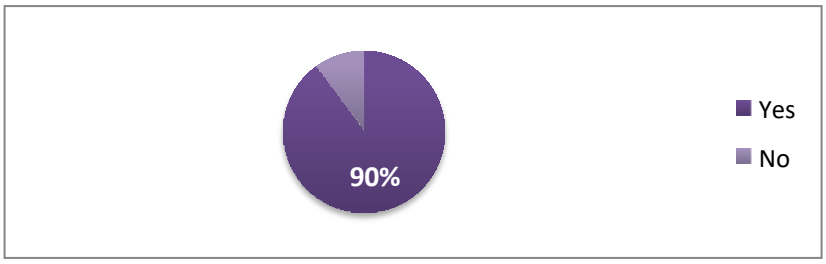

Figure 3.13 **Learners' Perceptions towards Watching English Videos**

The abovementioned **Figure 3.13** shows that the majority of respondents **(90%)** enjoys learning English through videos and appreciates it when their teachers incorporate educational videos as a teaching tool in the classroom. Yet, **(10%)** of the participants claimed that they do not enjoy learning English through the use of videos.

3.4.1.3 Section One

Students' Perceptions toward Watching Educational Videos

A crucial point worth considering is the students' perceptions of watching educational videos. Information were collected via asking students about their level of interest, engagement, capabilities, productivity, and performance. Moreover, they were asked about the clarity, relevance, and usefulness of the videos.

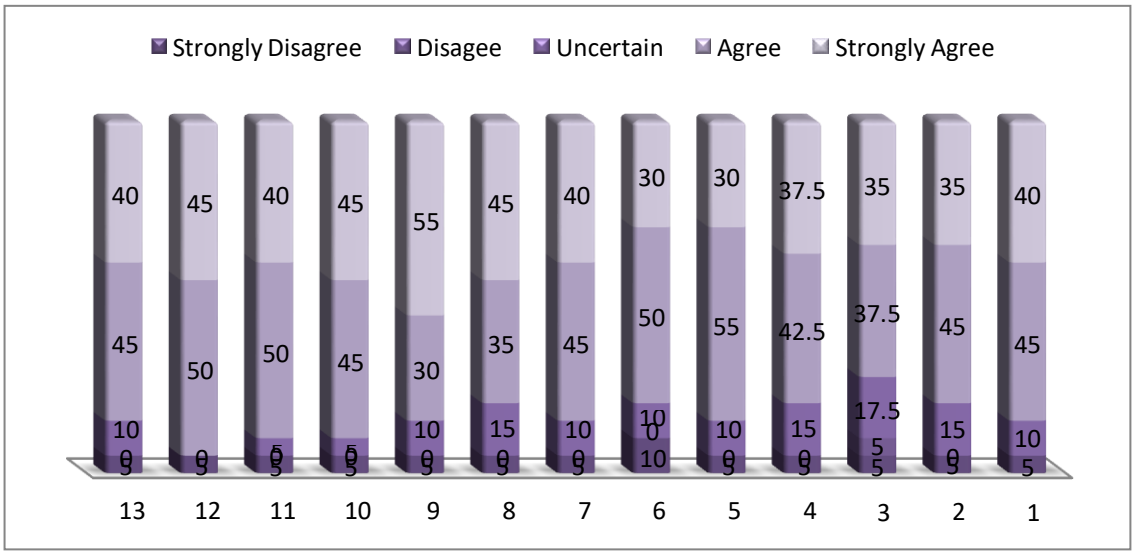

Figure 3.14 **Students' Perceptions toward Watching Educational Videos**

Item 1: Interest

With regard to the degree of agreement with the statement about whether "*Educational videos are interesting"*, the majority of the participants claimed to agree to a vast extent. However, the percentages demonstrate that participants have more positive opinions towards the idea; **(40%)** "Strongly Agree" and **(45%)** "Agree". While only **(5%)** of the participants chose "Disagree". Furthermore, **(10%)** of the participants showed a neutral opinion.

Item 2: Engagement

When asked if "e*ducational videos are engaged*", the overwhelming majority of respondents answered positively. **(35%)** of the participants and **(45%)** chose "Strongly Agree" and "Agree" respectively, while **(5%)** disagreed with the statement. Additionally, **(15%)** were undecided regarding this claim.

Item 3: Clarity

In the same vein, when participants were solicited about if "educational videos are clear and understandable", more than **(70%)** of students demonstrated videos clarity. Yet, a small proportion of them claimed the opposite **(10%)** with **(17.5%)** of the participants were neutral about their views.

Item 4: Concision and Precision

As far as concision and precision of the educational videos are concerned, the great majority of respondents assert "Strongly agree" with **(37.5%)** and "Agree" with **(42.5%)**. Regarding those who do not agree, they represented only **(5%)** of the whole percentage. Yet, **(15%)** of the participants were not sure whether to agree or disagree.

Item 5: Relevance

"*Educational videos provide relevant content*", this statement was asked to elicit responses from students about the fact that videos could provide them with relevant content. As shown in **Figure 3.8** and through the analysis, it was revealed that **(85%)** of the students agreed on the claim. On the other hand, only **(5%)** do not perceive the content's relevance of videos with **(10%)** undecided regarding this opinion.

Item 6: Helpfulness

"*Educational videos help me to understand concepts*". This item was about students' perceptions of the helpfulness of videos. As exposed in **Figure3.8**, a high percentage of participants "Strongly agreed" and "Agreed" with **(30%)** and **(50%)** respectively. However, it was noticed that **(10%)** among the respondents did not approve the statement. Interestingly, the percentage of participants who did not provide their opinions reached **(10%)**.

Item 7: Usefulness

To further investigate educational videos, the students were asked about their usefulness "*Educational videos are useful*". **Figure 3.8** shows that the majority of the respondents **(85%)** demonstrated a more favorable opinion towards the idea of the

usefulness of videos. Nevertheless, **(5%)** held an opposing opinion and the rest of the participants **(10%)** kept their opinions.

Item 8: Facility

To examine the degree to how educational videos will facilitate the learning process, students were asked to rate their perceptions. As it is indicated in **Figure 3.8** above, **(45%)** of the students stated that they "Strongly Agree" and **(35%)** "Agree". On the other hand, only **(5%)** claimed the opposite, followed by **(15%)** who were not sure whether to agree or disagree with the statement.

Item 9: Vocabulary Knowledge

"*Watching educational videos helps me to improve my vocabulary knowledge*". This item is about students' perceptions of whether videos could improve their vocabulary knowledge. The students, according to the results **(85%)**, believed in the effectiveness of videos concerning this matter, followed by **(10%)** who showed a neutral opinion and only **(5%)** disagreed with the statement.

Item 10: Learning Capabilities

The participants' perception about their learning capabilities could be investigated by asking the students whether "*watching educational videos improves their learning capabilities*". By referring to the frequencies and percentages appearing in **Figure 3.8**, it is noticed that only **(5%)** of the participants disagreed with the statement. Interestingly, **(90%)** of the students agreed, followed by **(5%)** undecided regarding this opinion.

Item 11: Learning Productivity

When asked about whether "watching educational videos enhances their learning productivity", the research analysis revealed that the majority of students **(90%)** asserted that videos could enhance their learning productivity. Nonetheless, **(5%)** of the respondents were not sure about their perception and **(5%)** claimed the opposite of the statement.

Item 12: Learning Performance

"*Watching educational videos increases my learning performance*" this item was asked to elicit whether or not videos could increase students' learning performance. As **Figure 3.8** demonstrates, a highly significant percentage **(45%)** and **(50%)** of students "Strongly Agree" and "Agree" respectively. Yet, only **(5%)** were not satisfied with videos concerning learning performance.

Item 13: Future Use

When asked if they intend to watch similar types of videos in the future, the research analysis shows that students **(85%)** welcome the idea. On another hand, **(5%)** seem to disagree, followed by **(10%)** who showed a neutral opinion.

3.4.1.4 Section Two

Students' Perceptions of Educational Videos Compared to Lecturing

To elicit information about the way students perceived educational videos compared to lecturing, their answers on a variety of criteria, including enjoyment, preference, easiness, clarity, effectiveness, materials' coverance, coverance efficacy, and difficulty, were considered.

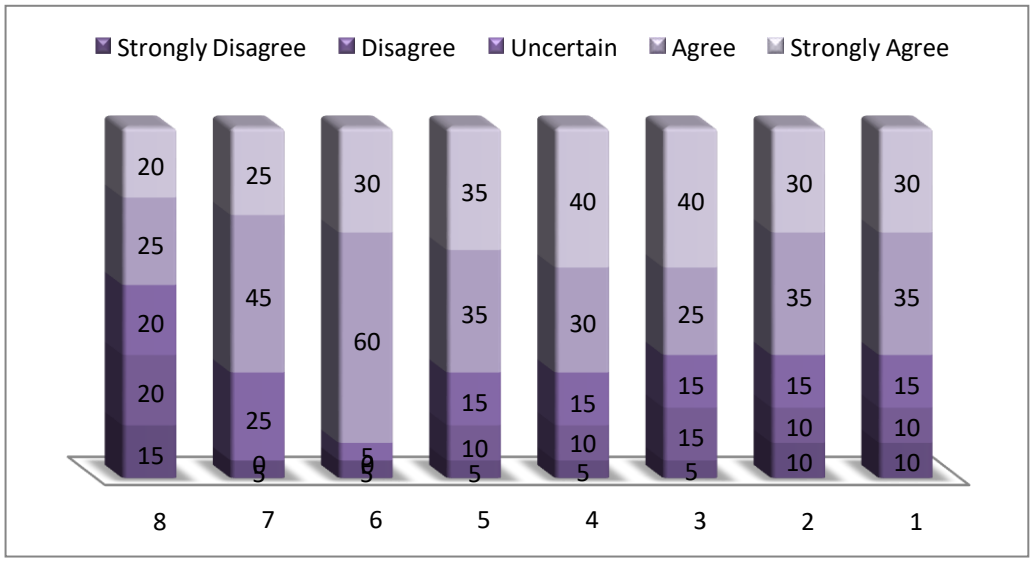

Figure 3.15 **Students' Perceptions of Educational Videos Compared to Lecturing**

Students' Perceptions of Educational Videos Compared to Lecturing.

Item 1: **Enjoyment**

When asked "I *enjoy watching educational videos more than lecturing*", the research analysis revealed that the minority **(20%)** of participants believed that lecturing is more enjoyable than watching videos and almost the same percentage **(15%)** of students could not decide which is enjoyable than the other. In contrast, the majority of respondents appeared to be "Strongly Agree" and "Agree" with the statements, **(30%)** and **(35%)** respectively.

Item 2: **Preference**

"*I prefer that lectures would be proceeded via watching educational videos*", the analysis of this item appeared to decipher some notably positive thoughts about students' preferences towards videos. Most respondents **(65%)** stated that they prefer lectures to be proceeded by watching videos. Opposing to this, **(20%)** of students disagreed with the claim, followed by **(15%)** who did not decide regarding this opinion.

Item 3: **Easiness**

Closely related to the perception of the preference for videos is the perception about the easiness to learn English through watching videos than by giving lectures. In **Figure 3.9**, it can be noticed that the majority of students reported a high percentage with respect to this trait **(65%)**. Interestingly, **(20 %)** thought the opposite regarding the ease of videos, as **(15%)** of the respondents were not sure of their point of view.

Item 4: **Clarity**

"*I was able to understand more from educational videos than from traditional lecturing*". This item was asked to elicit responses from students to the fact that videos provide clear and understandable content. In view of this and after the analysis, **(70%)** of the students believed that videos allow them to understand the content better than traditional lectures. In contrast, **(15%)** of participants reported the reverse, followed by **(15%)** who were undecided about their opinions.

Item 5: **Effectiveness**

"*I have learned better through educational videos than through lecturing*", another item was introduced to inquire about potential effectiveness when watching videos. As portrayed in **Figure 3.9**, only a minority disagreed regarding the videos' effectiveness **(15%)**. Moreover, **(70%)** chose either "Agree" or "Strongly agree", while **(15%)** of the students were indecisive about their point of view.

Item 6: **Materials' Coverance**

With respect to the materials' coverance, students were asked to rate their perception regarding the following item "*Educational videos were a faster way to cover the lecture's material than in lecturing*". It is noteworthy that the percentage of the students who agreed was **(90%)**. Less than **(5%)** stated that they did not agree with the statement and only **(5%)** were hesitant whether videos could be a faster way to cover the lecture's material than lecturing or not.

Item 7: **Coverance Efficacy**

Participants' perception of the efficacy of coverance could be checked by asking the students whether "*Educational videos were more effective to cover lecture's material than in lecturing*". Referring to the frequencies and percentages appearing in **Figure 3.9**, it was noticed that only **(5%)** of the participants disagreed with the statement. Interestingly, **(70%)** of the students agreed, followed by **(15%)** who were undecided regarding this opinion.

Item 8: **Difficulty**

When asked whether they found educational videos more challenging than lecturing, participants' responses were disparate. As shown in **Figure 3.9**, the results indicated that **(45%)** of students consider videos challenging and difficult. Furthermore, **(35%)** chose either "Disagree" or "Strongly Disagree", while **(20%)** of the students were indecisive about their point of view.

3.4.1.5 Section Three

Students' Perceptions of their Cognitive Load when Watching Educational Videos

Another key aspect worth investigated is the students' perceptions of their cognitive load when watching videos as well as whether it is affected after viewing. Information was obtained by asking students about their workload during and after watching the videos.

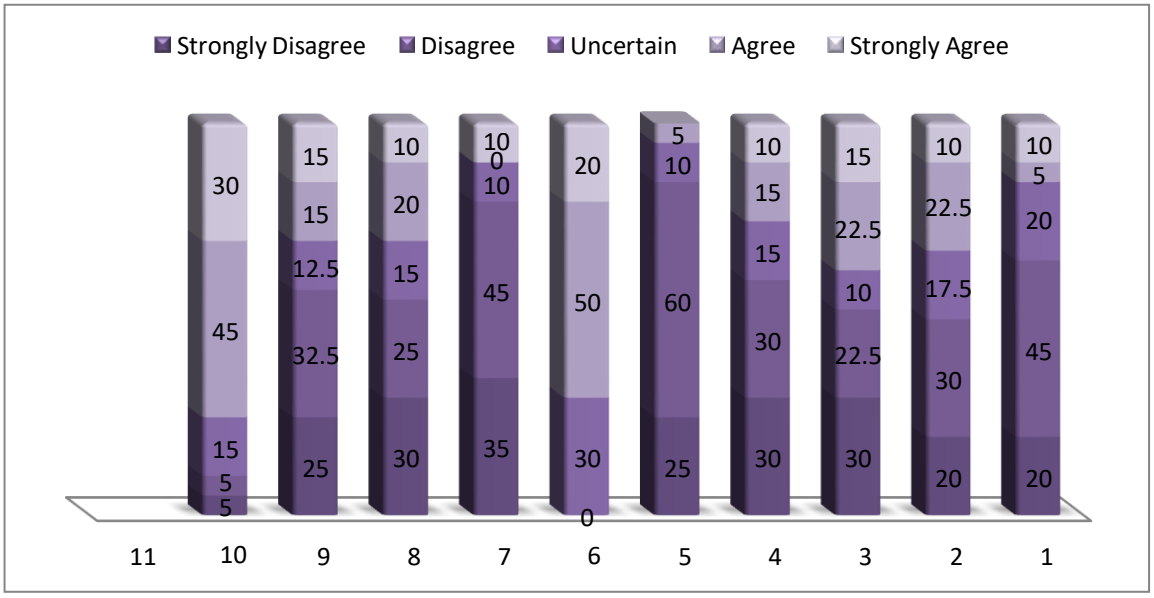

Figure 3.16 **Students' Perceptions of their Cognitive Load when Watching Videos**

Item 1:

"*Many things needed to be kept in mind simultaneously*", the analysis of this item appeared to decipher some notably positive thoughts about students' capacity to process information when watching videos. Most respondents **(65%)** stated that they are not forced to keep many information in mind simultaneously. Opposing to this, **(15%)** of students show agreement with the claim, followed by **(20%)** who did not decide regarding this claim.

Item 2:

"*The task was beyond my competencies*", as far as students' competencies are concerned, half of the respondents affirmed "Strongly Disagree" and "Disagree" with **(50%)**. As for those who do agree, they represented only **(32.5%)** of the whole percentage. However, **(17.5%)** of the participants were not sure whether to agree or disagree.

Item 3:

"*The learning material was challenging*". This item was about students' perceptions of the difficulty of the learning material. As exposed in **Figure3.16**, more than half of participants "Strongly Disagreed" and "Disagreed" with **(30%)** and **(22.5%)** respectively. However, it was noted that among the respondents **(32.5%)** agreed with the statement. Interestingly, the percentage of participants who did not provide their opinions reached **(10%)**.

Item 4:

To further investigate the effect of educational videos on cognitive load, students were asked about the effort they made "*I made an effort to understand the overall context*". **Figure 3.10** shows that the majority of the respondents **(60%)** demonstrated an unfavorable opinion towards the idea. Nevertheless, **(25%)** held an opposing opinion; i.e they made an effort to understand the general context, and the rest of the participants **(15%)** retained their opinions.

Item 5:

Participants' perception of the effort they made could be investigated by asking the students if "*They made an effort to understand several details*". By referring to the frequencies and percentages shown in **Figure 3.16**, it is noticed that only **(5%)** of the participants agreed with the statement. Interestingly, **(85%)** of the students disagreed, followed by **(10%)** who did not decide regarding this item.

Item 6:

"*The task helped me memorize more the content*" this item was asked to determine whether or not videos could help students to memorize the content. As **Figure 3.16** demonstrates, a highly significant percentage **(20%)** and **(50%)** of students "Strongly Agree" and "Agree" respectively. Nevertheless, no student disagreed on the previous claim, followed by **(30%)** who kept their opinions.

Item 7:

When asked about whether "*I am not interested in this learning material*", the research analysis in **Figure 3.16** revealed that the majority of participants **(80%)** confirmed that they are interested in learning through videos. Nonetheless, **(10%)** of the students were not sure of their perception and **(10%)** claimed the opposite of the statement.

Item 8:

"*It was exhausting to find important information*". This item was asked to elicit responses from students to the fact that it was difficult for them to find information. In light of this and after the analysis, more than half of students **(55%)** believe that the videos helped them find important information easily. In contrast, **(30%)** of participants reported the opposite, followed by **(15%)** who did not decide.

Item 9:

Closely related to the perception of the difficulty to find information is the perception about the difficulty to recognize and link crucial information "*It was difficult to recognize and link crucial information*". In **Figure 3.16**, it can be noticed that **(25%)** and **(32.5%)** of the students reported a high percentage with respect to this trait**.** That is, it was easy for them to recognize and link information. However, **(30 %)** thought the opposite with regard to the difficulty of the information, as **(12.5%)** of the participants were not sure of their point of view.

Item 10:

"*The workload for watching educational videos was appropriate*". This item is about students' perceptions of the workload during watching videos. According to the results, students **(75%)** believed in the appropriateness of video workload, followed by **(15%)** who showed a neutral opinion and only **(10%)** disagreed with the statement.

3.4.2 Discussion of the Post-Treatment Questionnaire Findings

The quantitatively analyzed data allow answering the third research question of this study: *What could be the learners' attitudes towards video-based learning?* and confirm,

or refute the research hypothesis H1: *If video-based learning is used in the classroom, EFL learners will have positive perceptions towards language learning*. The third research question was oriented towards obtaining participants' perceptions towards the integration of video-based learning presentations. A Likert scale questionnaire was administered to all participants in the experimental group. It should be noted that the questionnaire used to answer this research question adapted a 5-point Likert scale, inquiring students to select an answer on a range of 1 = Strongly Disagree to 5 = Strongly Agree. The questionnaire examined disputes related to easiness, relevance, interests, and usefulness etc. The data gathered and processed in the preceding sections have helped in addressing this research question. Frequencies, percentages, and t-tests provided rich information regarding the post-test results for both groups which will be useful in determining the perceptions of the experimental group's members about video-based learning format.

As previously reported, participants in the experimental group performed significantly much better in the post-test compared to participants in the control group. Therefore, their attitudes and perceptions towards video-based learning format were positively influenced. The findings of the post-treatment questionnaire are estimated to validate these results and provide further insights into the impact video-based learning had on participants in the experimental group. The results indicated that the majority of respondents expressed appreciation for participating in the study. The incorporated treatment was perceived by the participants as an effective remedy for decreasing the cognitive burden and fostering favorable attitudes about learning through videos. Likewise, video-based learning was reckoned as an opportunity to facilitate foreign language learning in an interesting manner. They, consequently, indicated a high degree of satisfaction with the treatment. This is undeniably the rationale for emphasizing the importance of video-based learning presentations in foreign language learning. These findings allow us to safely to confirm the alternative hypothesis ***H1:*** *If video-based learning is used in the classroom, EFL learners will have positive perceptions towards language learning*, indicating that video-based learning presentation is an effective learning tool in reducing EFL learners' cognitive load.

- ***The Importance of Video-Based Learning***

The results of the study were useful because they enabled us to validate the efficiency of video-based learning on foreign language teaching/learning, and secondly, to

attain knowledge of the students' perspectives on the use of such a treatment condition. The findings clearly show acquisition gains for EFL learners from the treatment condition because participants in the experimental group were able to learn via video exposure. The core objective of the third question is to determine whether or not students support the idea of incorporating video materials into the classroom. Following data analysis, it has been revealed that the students display favorable attitudes regarding the use of video materials in an EFL university context. They believe that utilizing video presentations in their classes facilitates the process of learning. In this regard, (Van Duzer, 1997) has stressed that video materials aid students to be exposed to real language discourse which comprises spoken language, a set of dialects, real pronunciation, intonation, hesitations, and rephrasing, all of which are difficult to be presented through traditional text-based instructions like textbooks or other materials easily.

From another perspective, there was an optimistic view of students' motivation in terms of attention between video-based instruction and traditional text-based instruction. Learners responded that the video presentations were more memorable than traditional text materials in decreasing cognitive overload. In this respect, Harmer (2007) points that using videos to learn a language increases learners' motivation that influences the amount of effort they put into learning a foreign language. This claim was equally certified by Dörnyei (2009) who revealed that video format was certainly one of the materials that motivated students seek out in order to have access to opportunities to learn a foreign language. According to him, students believe that video materials when used along with other types of materials bring variety, motivation, enjoyment, and flexibility in the classroom. As stated in the theoretical section of this study, the results, thus, correspond to the findings of (Dörnyei, 2009; Gardner, 2004) who concluded that motivation, is a core strategy in EFL classrooms that determines the success and effectiveness of teaching/learning process as well as the whole curriculum development program. This implies that the role of video materials in EFL classes is to stimulate students to acquire new words and concepts when learning a foreign language. Likewise, respondents agreed that lessons with different video presentations were more enjoyable and interesting**.** Similarly, in the context of this study, this finding lends support to what Mishan (2005) study has revealed**;** videos play a significant role in teaching English by creating a more pleasurable and entertaining class environment. Matching prior studies in the field of ELT, Richards (2007) agreed that video materials embrace a sort of authentic materials that have

a positive effect on learners' motivation. This implies that video-based learning depends on media resources that are potentially more stimulating than other traditional materials such as printed materials or textbooks.

Respondents in the experimental group revealed that watching video presentations affect a better understanding of the content to be taught. Respondents felt that they understood the meaning of words better when hearing and seeing the actions at the same time. This implies that the visual stimuli of the activities appeared to be attributable to a better understanding of the vocabulary so that the content, the study of (Koolstra & Beentjes, 1999) for instance has also evidenced that. Participants also felt that videos increased comprehension because it was easy to understand, accordingly, these findings are exceedingly affiliated with that of (Grgurović & Hegelheimer, 2007). This is also in line with Mekheimer (2011) who recognized that integrating video-based material with whole language teaching of the language skills of learners in a manner that enriches comprehension can lead to enhanced overall linguistic proficiency in EFL university students. This means that EFL teachers should consider videos that are embedded with cognitive load theory while selecting the teaching/learning materials.

From a different angle, participants displayed an improvement in vocabulary acquisition as compared to the control group. Once again, consistency was reflected in participants' significant performance in the post-test scores and their perceptions towards video-based learning implementation. Respondents think that video format assisted them to improve their vocabulary understanding, and hence their acquisition. The finding of this study corroborates the work of other studies as (Winke, Gass, & Syodorenko, 2010; Yuksel & Tanriverdi, 2009). According to the questionnaire's results, it is clear that students think that the use of videos is an effective vocabulary learning strategy while trying to make use of what they hear and see. Thus, video-based learning has a significant facilitative impact on short-term vocabulary acquisition. This implies that the visual stimuli of the activities appear to attribute to enhanced vocabulary comprehension. However, this conclusion is in sharp contrast with a study conducted by Etemadi (2012) which indicated that bimodal channels have no effect on vocabulary acquisition.

The findings of the questionnaire also revealed that participants find videos useful and could be an effective English teaching/learning approach to increase their performance as well as their language proficiency. In connection therewith, these accounts were mated

with those of Koskinen, Wilson, Gambrell, and Neuman (1993), who argued that video-based learning is a promising approach for enhancing language proficiency. In addition, students who learned through multimedia, such as videos, were more engaged in their studies and achieved better course performance. Thus, this improvement in English language proficiency resonates with the findings of previous studies such as those conducted by (Borrás & Lafayette, 1994; Zanón, 2006). In conformity with that, Paivio (1978) put forward that multiple presentations of information in verbal and visual forms resulted in higher performance and improved language proficiency as compared to a single presentation. This study supports the idea that exposure to multiple inputs via multiple channels results in better performance than exposure to only a single channel. As a consequence, combining visual and audio media improves language proficiency; these findings were coupled with those of Koskinen et al. (1993) who postulated that video is not only a promising approach for enhancing student's content comprehension, motivation, and vocabulary … etc, but also language performance and proficiency.

- ***The Effects of Video-Based Learning on Cognitive Load***

Findings in this area have indicated that many features of videos are beneficial for EFL students' learning. On the basis of the questionnaire data analysis, students perceived that the video-based instructions were more memorable than traditional text-based instruction. Videos, in particular, have a positive impact on learners' memory because the knowledge received via the medium of video can be easily and for a long time stored; hence, influencing students' to promote the intensification of the educational process and the creation of favorable learning circumstances. This could be due to the representations generated by both auditory and visual symbol systems which led to better mental models building of the situation than representations based solely on linguistic data (Baggett, 1984). As a good case in point Baggett (1984) found that learners can build a mental representation of semantic meaning from either audio or visual information, but when presented together, it seems that each source affords additional and complementary information that recalls some of the elements of the original code system. This circumstance seems to corroborate Riding, Rayner, and Banner (2000) argument that the use of diverse channels of information perception positively influences durability of storing language material. It is therefore a theoretical fact that videos addressing both mental channels can be employed as an efficient stimulus for storing and encoding

information than merely spoken or printed words, the outcomes of this research question is in concordant with (Čepon, 2013).

The findings of the present study do not contradict the explanation given by Kozma (1991) for the fact that the visual components are more memorable than the auditory components. Yet, he argued that simultaneous processing of auditory and visual information may aid learning. This implies that the audiovisual technologies, particularly videos, optimize the perception of the material as they use two channels of information perception; visual and auditory. In fact, each person has a leading modality of perception which allows him/her to perceive better than others. Audio-visual technologies "videos" allow learners to improve all channels of perception and enhance the cognitive activity of students (Tight, 2010). Accordingly, the obtained results seem to lend support to Cennamo (1993) who contended that video presentations should be structured to increase learners' mental effort and to engage them in active learning. This tends to reinforce constructivists' arguments that learners should engage in active, constructive, intentional, authentic, and cooperative learning for successful and effective learning, and this is well contended in (Jonassen, Peck, & Wilson, 1999).

Attention, for instance, is one of the major influences on motivation that learners must have for successful learning (Keller, 1983). In this study, there was a substantial difference in learners' attention between video-based instruction and traditional text-based instruction. The use of video supports the development of several sorts of students' activity, attention, and memory. This finding backs up Stempleski (1989) view, that video material creates an atmosphere of dual informative activity that optimizes the improvement of attention. The result implies that video-based instruction can be used effectively to motivate learners by grabbing their attention. This leads to the finding of language acquisition which was significantly higher in the experimental group compared to the control group. Furthermore, this research implies that video-based instruction can be an effective strategy for enhancing learners' retention, and along this line, this probe corresponds to that of Baggett (1984) view corroborating that visual information is more memorable, leading to better retention. Baggett found that summaries written a week after watching a movie were considered to be more complete than those written a week after listening to an audio version. This latter finding is in accordance with Jonassen et al. (1999) theoretical insight regarding retention; they reported that compared to expository

materials, stories presented via video can also help learners easily remember and retain content.

Moreover, the results of this study confirm that watching videos is a valuable learning strategy that improves students' cognitive processing since the video format did not increase students' extraneous cognitive overload, on the contrary, the way the information is presented in the video format abated it; thus, leaving sufficient resources available to students to process the germane and schema related load (Sweller, Van Merrienboer, & Paas, 1998). First, video exposure has apparently stirred in students a genuine sense of progress that is considered a vital motivational factor in FL classes; second, they seem to anticipate greater FL acquisition gains than from single modality methods or traditional text-based learning. The current research provided students with an excellent practical confirmation in which videos with such a treatment circumstance may improve FL learning without employing any conscious effort, specifically not by memorizing any explicit, conscious rules regarding the underlying FL system. The study explicitly presents empirically-based evidence for the effectiveness of video format in lessening extraneous cognitive load and redirecting the learner's attention toward increasing germane cognitive load during FL learning. This implies that the negative relationship between extraneous and germane load is in line with research showing that unclear instructions lead to decreased learning, particularly when instruction causes unnecessary processing due to irrelevant or redundant presentation of the material, these findings match those of (Mautone & Mayer, 2001; Mayer & Moreno, 2003).

- ***Students Satisfaction from Video-Based Learning***

This research intended to investigate the effects of integrating video-based learning on the cognitive load of the academic performance of EFL students at the Algerian state university and to evaluate their perceptions about learning English through videos. Overall, EFL learners perceived videos as being beneficial for their learning process and their responses about videos as a teaching/learning tool were positive. Respondents alluded to the fact that watching videos facilitated a better understanding of concepts and topics being taught in the classroom. As a result, this suggests that videos being part of students' learning are widely accepted among them. We interpret this as a promising indicator for establishing videos as a fundamental element of the entire teaching/learning process. Additionally, studies have proved that employing videos had a significant impact on

boosting learners' understanding, proposing an additional way of enhancing teaching for second language acquisition as recommended by Herron, Cole, Corrie, and Dubreil (1999).

Moreover, respondents perceived videos they watched as an enhancement to their learning outcomes and academic performance. This implies that, since students benefit from the videos they have watched, videos are not just an important supplement to traditional teaching methods, but a means of achieving desired learning goals. The fact that the educational academic performance of students has been enhanced by videos means that it reinforces the fact that they are now a vital tool in the whole teaching/learning process. To sum up, it is worth mentioning that the level of learning satisfaction is a crucial factor to consider when assessing the effectiveness of video-based learning presentation environments. That is, students should be exposed to language through different teaching aids such as videos in order to satisfy all the needs of learners in terms of language acquisition. Based on the findings of this research, it was evident that students who learned through a video-based learning format based on cognitive load theory instructions reported higher levels of satisfaction than those in the control group.

3.5 Conclusion

In this chapter, a detailed description was given about the results and findings of the study. The results were based mostly on the analyses of quantitative data, which were comprised of the students' pre-test and post-test scores, their responses to the rating scale questionnaire of Pass, and students' perceptions questionnaire. Accordingly, numerical and statistical evidence was employed to answer the research questions requiring the quantitative analysis. Interpretive comments were also given to discuss the findings of the qualitative data obtained from the teacher's diaries. The subsequent chapter includes a synthesis of the major findings, pedagogical implications for teachers and learners, a number of recommendations and suggestions for further research, and the limitations of the study.

Chapter Four: Pedagogical Implications and Recommendations

Chapter Four: Pedagogical Implications and Recommendations

4.1 Introduction

4.2 Pedagogical Implications

4.2.1 Implications for Syllabus Designers and for Policy Makers

4.2.2 Implications for Teachers

4.3 Recommendations

4.4 Limitations of the Study

4.5 Delimitation of the Study

4.6 Conclusion

4.1 Introduction

In the preceding chapter, the results of the analyzed data were reported along with a discussion on their significance. This chapter is the concluding part of the study. It discusses the conclusions drawn from the results of the present investigation and it revisits the research questions posed in the initial chapters. Furthermore, it presents a number of pedagogical, theoretical, and methodological implications for both teachers and learners that are related to the topic of the study. Finally, some suggestions for further research are discussed in light of what has been revealed by this study and what remains to be researched.

4.2 Pedagogical Implications

This section discusses the potential pedagogical implications based on the numerous findings of the present study that are worth mentioning to forge a basis for higher education researchers, academics, policymakers, and instructional designers to build and create video-based learning courses. It begins by considering the implications for syllabus designers and policymakers, particularly in terms of its methodology and practice in EFL classrooms, and provides teachers with various ideas and suggestions for the successful implementation of video-based learning. These are based on the experience gained through this study.

4.2.1 Implications for Syllabus Designers and Policy Makers

The study found an appreciable variation in levels of cognitive load between the experimental and control groups, and it revealed the association between video-based learning and amplified performance in learning. The effect sizes and statistically significant differences between the control and experimental groups were astounding. Video formats have the potential to significantly increase students' learning and enhance their participation in EFL courses. It is vital for teachers to keep in mind the three essential components; cognitive load, elements that affect engagement, and elements that support active learning so as to maximize the benefits of educational videos. Considering these components fulfills certain recommendations. First, videos should remain succinct and targeted toward the learning objectives. Second, audio-visual aspects should be used to convey appropriate explanations. Likewise, instructors are recommended to consider how

to make these aspects complementary rather than redundant.

Additionally, it is recommended to use signaling and cues to emphasize main ideas or concepts. Furthermore, it is suggested to use conversational and enthusiastic styles to boost learners' engagement. Lastly, videos should be embedded in an active learning framework through the employment of interactive aspects, guiding questions, and associated homework assignments. The findings suggested that instructional designers who are devoted to determining how to make cognitive load manageable, especially when teaching/learning difficult issues, would find that the application of active and interactive multimedia techniques like videos can help lessen the degree of cognitive overload, which is inexpedient for effective learning. Moreover, this study has recommended that cognitive load theory can assist teachers to understand the restraining constraints on students' learning caused by inefficient instructional design and the accompanying cognitive load. Consequently, cognitive load theory suggests effectual techniques to reduce these constraints.

This research provides an overview of cognitive load theory and introduces the different principles that were examined in cognitive and educational psychology. For instructional design, cognitive load theory as a framework is a matter of increasing attention and motivation in education, mainly within the sphere of multimedia learning applications. Teachers and researchers can contribute to the field of foreign language teaching research by applying the principles of cognitive load theory developed by Richard E. Mayer and Roxana Moreno (2018) to design and assess the instructional design that leads to educational effectiveness.

Video-based learning lessons should, first of all, reduce the amount of extraneous processing that hinders learning. When the material offered contains extraneous instructions or is poorly arranged, impediments to video-based learning might arise. The load that drains the available cognitive ability is known as extraneous overload or extraneous processing. In these circumstances, students are equipped to engage in extraneous cognitive processing, which is not directly pertinent to learning the necessary instructions. Students should not engage in large amounts of extraneous processing since their cognitive ability amount is limited. Otherwise, they may have a remaining deficient ability for important generative processing required for significant learning. Yet, the literature has proposed numerous techniques for minimizing extraneous cognitive

processing, including the coherence principle, redundancy principle, signaling principle,spatial contiguity, and temporal contiguity principles.

- **Coherence Principle:** Instructional designers should exclude and inconsiderate interesting yet extraneous layouts and illustrations from multimedia instruction. Thus, leaving more capabilities for essential and generative processing that can lead to more meaningful learning outcomes.
- **Redundancy Principle:** Instructional designers have to remove redundant illustrations from video presentations to avoid students' attempts to reconcile the two incoming verbal modes. Therefore, students engage in less extraneous processing by freeing up cognitive abilities for use in essential and generative processing.
- **Signaling Principle:** Instructional designers sometimes may not always be able to eliminate extraneous instructions from a multimedia-based lesson. Accordingly, supplying cues that direct the students' attention towards the essential material may be a useful alternative. Cues or signals could be outlines, headings, or highlights that help decrease extraneous processing.
- **Temporal Contiguity Principle:** Extraneous cognitive load is created when students must use their cognitive abilities to retain corresponding words and visuals in working memory at the same time. Consequently, students are able to mentally combine the verbal and visual material within each segment, thereby minimizing the requirement to retain the materials in working memory for long periods of time.
- **Spatial Contiguity Principle:** Extraneous processing can also be triggered by receiving inconsiderate illustrations that arise when words and visuals are not close to one another in a multimedia format. Instructional designers may decrease this type of extraneous processing by positioning words closer to the visual part they describe, thus allowing more ability to be used for essential and generative processing.

The second principle regarding the implementation of video-based learning lessons is to manage essential processing so that the student's cognitive system is not overloaded. Actually, instructional designers should be able to eliminate extraneous and inconsiderate materials from the video presentation. Otherwise, students will have an unavailable ability

for valuable cognitive capacity due to extraneous processing that will prevent them from being engaged in essential processing. Yet, sometimes, the demands of essential processing may exceed the student's cognitive ability resulting in essential overload (Mayer & Moreno, 2003; Mayer, 2005b). The latter can arise when the essential material is difficult, unknown, or presented at a fast pace. The material is difficult when there are a lot of components interacting with each other. Furthermore, the material is unknown when the student lacks relevant previous knowledge because this knowledge might be utilized to chunk the material received into larger meaningful pieces, hence, successfully decreasing cognitive load. Finally, the material is fast-paced when the video display rate exceeds the amount of time it takes the student to receive the material. Segmenting, pretraining, and modality principles are all necessary for managing essential processing.

- **Segmenting Principle**: Instructional designers should help students understand the presentation by breaking it into bite-sized chunks that they can manage and control, thereby representing one part of the system before moving on to the next. Nevertheless, students with insufficient prior knowledge are expected to encounter cognitive overload as they endeavor to represent the material mentally.
- **Pretraining Principle**: Instructional designers should provide pretraining to help students acquire prerequisite knowledge that will aid in the processing of instructions. It is about the major components of the material, such as the name, location, and so on. Pretraining seeks to embed relevant knowledge in long-term memory so that students can devote less processing to new incoming material.
- **Modality Principle:** In some cases when the material is complex, unfamiliar, and fast-paced, presenting instructions may create split attention. As a result, the demands of essential processing can overwhelm students (Sweller 1999). The modality principle may aid in the management of essential processing by distributing the cognitive load across both channels; visual and verbal. That is, students are able to off-load some cognitive load from the visual channel which is overloaded to the verbal channel.

The final principle of using video-based learning focuses on promoting and fostering generative processing in which extraneous processing is eradicated and essential

processing is managed; hence, the student has the opportunity to engage in generative processing. In review, the intrinsic cognitive load caused by element interactivity may have a considerable impact on the instructional consequence of extraneous cognitive load. On the one hand, when dealing with low element interactivity material, the extraneous cognitive load may have negligible consequences. On the other hand, when dealing with a material that has high element interactivity, the effects of extraneous cognitive load may become primary since the combined consequences of a high extraneous and high intrinsic cognitive load could overwhelm limited cognitive processing skills.

4.2.2 Implications for Teachers

The major themes that emerged from the data analysis afforded certain practical implications for teachers who are interested in the design and selection of EFL materials. The findings imply that both teachers and learners in a higher education environment demonstrate a tremendous tendency towards the incorporation of video-based learning in the classroom as a pedagogical tool for developing learners' language skills. This entails that English teachers may incorporate video materials to teach a wide range of subjects (reading, writing, grammar, speaking, and listening). As a result, teachers may strengthen and enhance speaking and oral communication by drawing on all subjects. In order to achieve this; the teacher's primary responsibility is to determine which topics and themes best suit students' needs and abilities. That is; the topics are adopted according to the level of students and their requirements. In turn, videos are considered to be an efficient strategy that assists in motivating learners and encouraging them to get drawn in classroom activities and discussions. The subsequent implication is allied to the principle that teachers should play a vital role in designing and applying video materials in their lessons according to the sort of the subject. Additionally, teachers need to be aware of certain factors while selecting video resources, such as learners' contextual culture, language proficiency level, interest, and age. This means that teachers as effective instructional designers should be aware of the astute of incorporating video presentations through three key stages previewing, post-viewing, and discussions and interactions.

4.3 Recommendations

On the cornerstone of the determinations stated supra, and in the light of the existing findings and limitations, betoken respective potential avenues and worthwhile directions

for future research should be identified. Video-based learning, cognitive load, and EFL students' academic performance are all intriguing zones that endure discussion and require thorough examination, thus a number of research areas were deemed plausible.

Cognitive theorists urge teachers and instructional designers to design instructions based on the cognitive load theory. Therefore, the core of this study was to confirm the different effects of incorporating video-based learning with regard to cognitive load theory. This is vital because there is no evidence to support the theoretical assumptions surrounding fundamental learning variables. The findings of this research demonstrate the importance of the cognitive theory of multimedia learning within the context of video-based learning instructional modalities. To the best of my knowledge, there have been no studies in previous research in Algeria investigating the effects of video-based learning on cognitive load as well as instructional design prior to and throughout the period of the research. Despite of the limitations highlighted below, we believe that this study makes valuable contributions to the existing literature. Future studies might use the findings in this probe as a basis for delving deeper into the cognitive load theory in different multimedia contexts. Along the same lines, the researcher recommends future researchers to improve and conduct deeper research related to the implementation of video-based learning so as to encourage effective teaching and learning. For instance, future researchers could elaborate methods and gather data for that particular research or integrate videos into another setting that focuses on improving English language skills such as listening, speaking, reading, and writing.

Future research on video-based learning and cognitive load measurement should focus on identifying the load associated with various specific learning processes. Measuring cognitive load during problem-solving entails mapping mental activities such as mental effort, mental load, and mental efficacy engaged in multimedia learning. Future longitudinal and cross-sectional research studies might adopt a mixed-method research design that incorporates a combination of methodologies and instruments. Other studies might conduct qualitative research including observations and interviews to obtain more thorough information. On the one hand, observations used in future research should help determine the degree to which self-reported practices correspond to actual behaviors. On the other hand, researchers could also opt to interview respondents, thereby allowing further exploration of the concerns revealed by questionnaire responses. Combined

together, these techniques would contribute to a deeper understanding of participants' perceptions and use of video-based learning, as well as also innovations in practice.

Future research or follow-up studies of this research study should; first, employ a larger solid sample size in order to improve the precision and reliability of the results. Due to the administrative constraints, this study could not carry out random selection; hence, a quasi-experimental design and mixed-methods analysis consisting of both quantitative and qualitative data were employed. Future researchers should seek administrative support first so that they can broaden the scope of their research study to encompass other contexts and larger participants. In other words, future researchers should replicate with as many samples as possible from different universities to achieve more accurate and precise results and to enhance the generalizability of the findings. Second, future studies need to be conducted with longer experimental treatments. Hence, if the treatment had been administered for longer, the result could have been significant on the dependent variables or different from one derived in this study.

Furthermore, with respect to the assessment of post-tests, it is possible to have a co-rater who is willing to assess post-tests using an analytical scale based on an evaluation checklist for assessment designed by the researcher; thus, ensuring a certain degree of objectivity. Researchers conducting follow-up studies should be mindful of some issues such as time and effort, and also the related tools, software, and materials that need to be maintained from the outset. In terms of the teaching experiment, researchers should pay attention to the amount of time allotted to each activity as students should have sufficient time to ponder and respond. These procedures would assist in validating the instruments outlined in this research as well as establishing the reliability and validity of the entire thesis.

It is recommended for future studies to conduct more researches on audiovisual technologies, developing new algorithms and tasks to increase the effectiveness of foreign language teaching. Moreover, they are prompted to investigate the effect of the video presentations on reducing cognitive load and increasing recall of the information for different learning areas, and not only EFL setting. When employing the cognitive load theory multimedia principles on different learning areas, the relationship could be well recognized between element interactivity and a reduction in cognitive load.

4.4 Limitations of the Study

Albeit the fact that the methodological cogency was deemed significance in the current probe, and thereby the accomplishments of the research objectives, various inevitable obstacles and problems have been encountered, asacknowledged below:

- To begin, one limitation can be attributed to the sampling procedures, due to the dissimilar schedules of first-year LMD students; random sampling of the participants was impossible. As a corollary, the sample being opted for may not be representative of the entire population, which may limit the external validity of the study. Likewise, random assignment of individual students to the experimental and the control groups was impossible. The researcher was compelled to dispatch the investigation with the whole groups that were taken as an experimental group or a control group. Consequently, certain pre-existing differences may have threatened the study's internal validity.
- Second, the infeasibility of random sampling and the limited sample size jeopardized the generalizability of the results. The study sample was confined to one English department in one university, unashamedly, it is not representative of the wider population, and results cannot be over-generalized beyond the case subjects.
- In addition, the validity of the findings from data gathering instruments including reflective journals might be vulnerable to potential bias. Yet, the quantitative data collected were measured and analyzed judiciously. Thus, the findings were logically consistent and chiefly confirmed by results drawn from the analysis of qualitative data.
- Furthermore, with regard to the time of the experiment, the length of the video-based learning intervention was throttled owing to time constraints. Therefore, lengthier treatment duration sessions might be required to ascertain the concluded effects and tackle different topics related to cognitive load theory.

Lastly, regarding the post-test assessment, the students' work was corrected by the researcher herself due to the unavailability of a co-rater who would have willed to assess the post-test using an analytical scale. That is to say, inter-rater reliability was missing, and thus, some degrees of subjectivity could be found.

4.5 Delimitations of the Study

In order to eliminate some of the foremost threats to the internal validity of this research, a range of measures were considered. In fact, the findings of this scrutiny are closely related to the sample under examination and are only restricted to the model adopted for the previously presented variables.

4.6 Conclusion

The current research investigated the effects of video-based learning on students' cognitive load. It has shown promising results for the use of video-based learning in increasing students' knowledge. Despite a few highlighted limitations in design, sample and measuring instruments, the effect of video-based presentations is revealed. Recommendations for further studies have been described and this study should be considered as the beginning of much research into methods for reducing cognitive load for students, as well as investigations into the accurate and objective measurement of cognitive load.

General Conclusion

With the intent of exposing foreign language learners to the target language, technology has to be exploited as much aspossible in the classroom. For that reason, there has been a significant increase in the use of technology and its incorporation into the curriculum developed by foreign language teachers. In recent research on technology integration into teacher education curriculum, the use of video, in particular, has received a growing attention. Videos might strongly bean effective material that enables students to practice what they have learned using avariety of techniques. Therefore, students can contextualize the language they learned fromthe video. In other words, they can see and hear the speakers in dialogues, including theirage, gender, and possibly their relationship with each other, as well as their clothing, social status, activities, and feelings. Furthermore, as briefly noted above, paralinguistic or non-verbal elements such as facial expressions or hand gestures offer auditory indicationsand cues to the learner. Students may also observe the communication setting on the screen, and this allows them to decide whether the situation is formal or informal. From a methodological perspective, this study yielded a number of insights on the use of video- based learning. Corroborating preceding research, video formats are advantageous since they lead to a higher depth of processing by engaging attention, promoting vocabulary acquisition across different modalities, and allowing students to settle on meaning. The researcher encourages and invites other researchers to replicate this study in order to build a larger database of students with a wider range of proficiency levels.

The video format in this study had no effect on raising students' extraneous cognitive overload. On the contrary, it has truly subsided the way information is delivered in the video format, leaving enough income available for students to process the germane; schema-related load. It appears that many of the research participants from the study look forward to learning a FL in a formal context via videos since they expect larger FL acquisition benefits than via single modality methods or textbooks. Our findings demonstrated that a video with such a treatment condition could improve EFL learning without students exerting any conscious effort, particularly by memorizing any explicit and conscious rules related to the underlying FL system. The research study also purposely presents empirical evidence for the usefulness of the video format in lessening extraneous

cognitive load during FL learning and redirecting students' attention toward boosting germane cognitive load.

Cognitive load theory is a practical approach that instructional designers, teachers, and educators may utilize to develop effective instructions. Effective instruction avoids cognitive overload since it takes into account the characteristics of human cognitive architecture. Cognitive load theory has been applied and refined in a variety of fields, including language teaching, notably teaching English as a second or foreign language. In designing teaching instructions, worked example, split-attention effect, modality effect, and redundancy effect are efficient techniques for reducing extraneous load, increasing the germane load, and constructing and automating schema. For instance, when designing worked examples, teachers should consider the split-attention effect by avoiding it by physically integrating texts and diagrams rather than separating them in isolation. As a consequence, the extraneous load is minimized, and learning is improved. The modality effect is another strategy for designing useful instruction by addressing the audio-visual components of information. The human brain is divided into two channels; auditory and visual. As a result, using dual-mode channels to boost learning is highly suggested due to the fact that when both channels are activated, the cognitive load is reduced. As long as designing and developing new instructions using cognitive load theory is considered valuable, teachers should fully comprehend this concept as each instructional technique is linked to one another. In addition, before designing instructions, it is essential to consider students' level of expertise, element interactivity, and sources of information. Teachers, particularly language teachers should understand and apply the elements of information and instructional strategies covered by the concept of cognitive load theory. Ultimately, teaching a foreign or second language is a difficult task for non-native English teachers; however, effective instructional design can support and enhance the teaching-learning processes.

The ignorance of human cognitive skills can lead to serious issues that can impair learning. Teaching is not just about providing knowledge it is much more than that. For example, the learning process is interfered with various factors that instructional designers and teachers should be aware of. The researcher believes that the Algerian Ministry of Higher Education should prioritize quality over quantity. As outlined previously, human cognitive abilities are limited; hence, humans are unable to process huge amounts of information at the same time. In the same context, students will not be able to process a

large amount of information provided by teachers. Consequently, the learning process will be impaired.

Moreover, albeit students are able to memorize the afforded information, they will be unable to retain it for a long time since information is stored in working memory which has a limited duration and capacity for storing. Furthermore, teachers and instructional designers should be well-versed with the cognitive load theory. They should be introduced to the human cognitive architecture as well as the different types of cognitive load. This is crucial to know how humans process information; therefore, knowing how to present information effectively to their students. They will also know how much information their students can process in order to avoid overloading their memories.

To summarize, this study yielded promising results for incorporating video-based learning to boost learners' knowledge. By integrating video-based learning and designing instructions based on cognitive load theory, all the experimental group's respondents were able to complete the task with good marks and successful learning. This might imply that the embedded video with cognitive load theory should be considered by EFL teachers when selecting learning materials or even while developing their own. Additionally, all respondents of the experimental group shared the same positive perceptions towards learning through videos. Despite a few highlighted limitations, the effect of video-based learning presentations is undeniable. Recommendations for further studies have been described as far as this research is concerned. This study should be considered as a background for further research into methods of reducing cognitive load as well as investigations into the accurate and objective cognitive load measurement. The framework suggested in this research may be utilized as a guideline for educational video incorporation based on cognitive load theory. For superior efficiency, while teaching and learning using videos, teachers or instructional designers should consider the recommended factors for using video as a teaching aid in class.

References

Acha, J. (2009). The effectiveness of multimedia programmes in children's vocabulary learning. *British journal of educational technology, 40*(1), 23-31.

Adnan, A. (2016). The Role of Technology in Teaching Listening.

Ahmadi, D., & Reza, M. (2018). The use of technology in English language learning: A literature review. *International Journal of Research in English Education, 3*(2), 115-125.

Al-Rahmi, W. M., & Zeki, A. M. (2017). A model of using social media for collaborative learning to enhance learners' performance on learning. *Journal of King Saud University-Computer and Information Sciences, 29*(4), 526-535.

Al Seghayer, K. (2001). The effect of multimedia annotation modes on L2 vocabulary acquisition: A comparative study. *Language Learning & Technology, 5*(1), 202-232.

Albirini, A. (2006). Teachers' attitudes toward information and communication technologies: The case of Syrian EFL teachers. *Computers & Education, 47*(4), 373-398.

Altman, R. (1989). *The video connection: Integrating video into language teaching*: Houghton Mifflin College Division.

Arifah, A. (2014). Study on the use of technology in ELT classroom: Teachers' perspective. *Department of English and Humanities, BRAC University, Bangladesh*.

Ashburn, E. A., & Floden, R. E. (2006). *Meaningful learning using technology: What educators need to know and do*: Teachers College Press.

Asma, H., & Dallel, S. (2020). Cognitive Load Theory and Its Relation to Instructional Design: Perspectives of Some Algerian University Teachers of English. *Arab World English Journal, 11*(4), 110-127.

Asokhia, M. (2009). Improvisation/teaching aids: Aid to effective teaching of English language. *International Journal of Educational Sciences, 1*(2), 79-85.

Baddeley, A. D., & Hitch, G. (1974). Working memory *Psychology of learning and motivation* (Vol. 8, pp. 47-89): Elsevier.

Baggett, P. (1984). Role of temporal overlap of visual and auditory material in forming dual media associations. *Journal of educational psychology, 76*(3), 408.

Balslev, T., De Grave, W. S., Muijtjens, A. M., & Scherpbier, A. (2005). Comparison of text and video cases in a postgraduate problem-based learning format. *Medical education, 39*(11), 1086-1092.

Banks-Wallace, J. (2008). Eureka! I Finally Get IT: Journaling as a Tool for Promoting Praxis in Research. *ABNF Journal, 19*(1).

Baylor, A. L., & Ritchie, D. (2002). What factors facilitate teacher skill, teacher morale, and perceived student learning in technology-using classrooms? *Computers & Education, 39*(4), 395-414.

Baytak, A., Tarman, B., & Ayas, C. (2011). Experiencing technology integration in education: children's perceptions. *International Electronic Journal of Elementary Education, 3*(2), 139-151.

Becker, H. J. (2000). Access to classroom computers. *Communications of the ACM, 43*(6), 24-24.

Beetham, H., & Sharpe, R. (2007). *Rethinking pedagogy for a digital age: Designing and delivering e-learning*: routledge.

Bennett, D., McMillan-Culp, K., Honey, M., Tally, B., & Spielvogel, B. (2000). *It all depends: Strategies for designing technologies for education change.* Paper presented at the International Conference on Learning with Technology," Does Technology Make a Difference.

Borrás, I., & Lafayette, R. C. (1994). Effects of multimedia courseware subtitling on the speaking performance of college students of French. *The Modern Language Journal, 78*(1), 61-75.

Bouman, L. (1990). *Veni, video, vici: Video in language teaching.* Paper presented at the Journal of English Teaching Forum.

Brandl, K. (2002). The integration of internet-based reading materials into the foreign language curriculum: From teacher-to student-centered approaches. *Language Learning & Technology, 6*(3), 87-107.

Brooks, K. R., & Arthur, U. E. (1999). Digital entertainment terminal providing dynamic execution in video dial tone networks: Google Patents.

Brooks, P. J., & Kempe, V. (2014). *Encyclopedia of language development*: Sage Publications.

Brown, D., & Warschauer, M. (2006). From the university to the elementary classroom: Students' experiences in learning to integrate technology in instruction. *Journal of Technology and Teacher Education, 14*(3), 599-621.

Brown, J. S., Collins, A., & Duguid, P. (1989). Situated cognition and the culture of learning. *Educational researcher, 18*(1), 32-42.

Brünken, R., Steinbacher, S., Plass, J. L., & Leutner, D. (2002). Assessment of cognitive load in multimedia learning using dual-task methodology. *Experimental psychology, 49*(2), 109.

Bull, S., & Ma, Y. (2001). Raising learner awareness of language learning strategies in situations of limited resources. *Interactive Learning Environments, 9*(2), 171-200.

Bullock, D. (2004). Moving from theory to practice: An examination of the factors that preservice teachers encounter as the attempt to gain experience teaching with technology during field placement experiences. *Journal of Technology and Teacher Education, 12*(2), 211-237.

Cakir, I. (2006). The use of video as an audio-visual material in foreign language teaching classroom. *Turkish Online Journal of Educational Technology-TOJET, 5*(4), 67-72.

Canning-Wilson, C., & Wallace, J. (2000). Practical aspects of using video in the foreign language classroom. *the internet TESL Journal, 6*(11), 36-31.

Cennamo, K. S. (1993). Learning from video: Factors influencing learners' preconceptions and invested mental effort. *Educational Technology Research and Development, 41*(3), 33-45.

Čepon, S. (2013). Effective use of the media: Video in the foreign language classroom. *Medijska istraživanja: znanstveno-stručni časopis za novinarstvo i medije, 19*(1), 83-105.

Chabon, S. S., & Lee-Wilkerson, D. (2006). Use of journal writing in the assessment of CSD students' learning about diversity: A method worthy of reflection. *Communication disorders quarterly, 27*(3), 146-158.

Chai, C. S., Khine, M. S., & Teo, T. (2006). Epistemological beliefs on teaching and learning: A survey among pre-service teachers in Singapore. *Educational Media International, 43*(4), 285-298.

Chandler, A. C., & Cypher, I. F. (1948). *Audio-visual techniques for enrichment of the curriculum*: Noble and Noble.

Chandler, P. (2009). Dynamic visualisations and hypermedia: Beyond the "Wow" factor. *Computers in Human Behavior, 25*(2), 389-392.

Chandler, P., & Sweller, J. (1991). Cognitive load theory and the format of instruction. *Cognition and instruction, 8*(4), 293-332.

Chien, Y.-T., & Chang, C.-Y. (2012). Comparison of different instructional multimedia designs for improving student science-process skill learning. *Journal of Science Education and Technology, 21*(1), 106-113.

Choi, H. J., & Johnson, S. D. (2005). The effect of context-based video instruction on learning and motivation in online courses. *The American Journal of Distance Education, 19*(4), 215-227.

Choi, H. J., & Johnson, S. D. (2007). The effect of problem-based video instruction on learner satisfaction, comprehension and retention in college courses. *British journal of educational technology, 38*(5), 885-895.

Choi, Y. K. (1994). Attitudes toward and knowledge of microcomputers used for instruction among commercial high school teachers in Korea.

Clark, J. M., & Paivio, A. (1991). Dual coding theory and education. *Educational psychology review, 3*(3), 149-210.

Clark, R. C., Nguyen, F., & Sweller, J. (2011). *Efficiency in learning: Evidence-based guidelines to manage cognitive load*. United States of America: John Wiley & Sons.

Cook, A. E. (2009). Measurement of cognitive load during multimedia learning activities *Cognitive effects of multimedia learning* (pp. 34-50): IGI Global.

Cook, T. D., & Campbell, D. T. (1979). The design and conduct of true experiments and quasi-experiments in field settings *Reproduced in part in Research in Organizations: Issues and Controversies*: Goodyear Publishing Company.

Corbin, J., & Strauss, A. (2008). Strategies for qualitative data analysis. *Basics of Qualitative Research. Techniques and procedures for developing grounded theory, 3*.

Cresswell, J. W. (2012). Planning, conducting, and evaluating quantitative and qualitative research. *Educational Research*.

Creswell, J. W., & Tashakkori, A. (2007). Differing perspectives on mixed methods research: Sage Publications Sage CA: Los Angeles, CA.

Crosbie, T. (2006). Using activity diaries: Some methodological lessons. *Journal of Research Practice, 2*(1).

Dawson, K., Cavanaugh, C., & Ritzhaupt, A. D. (2008). Florida's EETT leveraging laptops initiative and its impact on teaching practices. *Journal of Research on Technology in Education, 41*(2), 143-159.

De Vaus, D. (2001). *Research design in social research*: Sage.

Denscombe, M. (2008, July). Communities of Practice: A Research Paradigm for the Mixed Methods Approach.

Dörnyei, Z. (2009). *The psychology of second language acquisition*: Oxford University Press Oxford.

Dörnyei, Z., & Taguchi, T. (2009). *Questionnaires in second language research: Construction, administration, and processing*: Routledge.

Dudeney, G., & Hockly, N. (2012). *How to teach English with technology*. Harlow: Pearson Education.

Eady, M., & Lockyer, L. (2013). Tools for learning: Technology and teaching. *Learning to teach in the primary school, 71*.

Egbert, M. (1991). The Video Connection: Integrating Video into Language Teaching by Rick Altman. Boston: Houghton Mifflin Company, 1989. 184 pp. *Issues in Applied Linguistics, 2*(1).

Ertmer, P. A. (2005). Teacher pedagogical beliefs: The final frontier in our quest for technology integration? *Educational Technology Research and Development, 53*(4), 25-39.

Ertmer, P. A., Paul, A., Molly, L., Eva, R., & Denise, W. (1999). Examining teachers' beliefs about the role of technology in the elementary classroom. *Journal of research on Computing in Education, 32*(1), 54-72.

Etemadi, A. (2012). Effects of bimodal subtitling of English movies on content comprehension and vocabulary recognition. *International Journal of English Linguistics, 2*(1), 239.

Flick, U. (2010). Triangulation *Handbuch qualitative Forschung in der Psychologie* (pp. 278-289): Springer.

Foley, J. A., & Ojeda, C. (2008). *Teacher beliefs, best practice, technology usage in the classroom: A problematic relationship*. Paper presented at the Society for Information Technology & Teacher Education International Conference.

Foster, J. K. (2009). *Memory: a very short introduction* (Vol. 194): Oxford University Press.

Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (1993). *How to design and evaluate research in education* (Vol. 7): McGraw-hill New York.

Friedenberg, J., & Silverman, G. (2011). *Cognitive science: An introduction to the study of mind*: Sage.

Galavis, B. (1998). *Computers and the EFL class: Their advantages and a possible outcome, the autonomous learner*. Paper presented at the English Teaching Forum.

Gardner, H. (1985). The mind's new science : a history of the cognitive revolution, from http://search.ebscohost.com/login.aspx?direct=true&scope=site&db=nlebk&db=nlabk&AN=502966

Gardner, R. C. (2004). Attitude/motivation test battery: International AMTB research project. *Canada: The University of Western Ontario*.

Garza, T. J. (1991). Evaluating the use of captioned video materials in advanced foreign language learning. *Foreign Language Annals, 24*(3), 239-258.

Gee, J. P., & Hayes, E. (2011). *Language and learning in the digital age*. London: Routledge, Taylor & Francis Group.

Genc Ilter, B. (2009). Effect of technology on motivation in EFL classrooms. *Online Submission, 10*(4).

Gerjets, P., Scheiter, K., & Cierniak, G. (2009). The scientific value of cognitive load theory: A research agenda based on the structuralist view of theories. *Educational psychology review, 21*(1), 43-54.

Gilakjani, A. P. (2017). A review of the literature on the integration of technology into the learning and teaching of English language skills. *International Journal of English Linguistics, 7*(5), 95-106.

Gliner, J. A., Morgan, G. A., & Leech, N. L. (2011). *Research methods in applied settings: An integrated approach to design and analysis*: Routledge.

Godzicki, L., Godzicki, N., Krofel, M., & Michaels, R. (2013). Increasing Motivation and Engagement in Elementary and Middle School Students through Technology-Supported Learning Environments. *Online Submission*.

Gorard, S. (2013). The propagation of errors in experimental data analysis: A comparison of pre-and post-test designs. *International Journal of Research & Method in Education, 36*(4), 372-385.

Gough, N. (1993). Environmental education, narrative complexity and postmodern science/fiction. *International Journal of Science Education, 15*(5), 607-625.

Graham, C. R. (2006). Blended learning systems. *The handbook of blended learning: Global perspectives, local designs*, 3-21.

Graves, K., & Xu, S. (2000). *Designing language courses: A guide for teachers*: Heinle & Heinle Boston, MA.

Grgurović, M., & Hegelheimer, V. (2007). Help options and multimedia listening: Students' use of subtitles and the transcript. *Language Learning & Technology, 11*(1), 45-66.

Guariento, W., & Morley, J. (2001). Text and task authenticity in the EFL classroom. *ELT journal, 55*(4), 347-353.

Guo, P. J., Kim, J., & Rubin, R. (2014). *How video production affects student engagement: An empirical study of MOOC videos.* Paper presented at the Proceedings of the first ACM conference on Learning@ scale conference.

Harmer, J. (2001). Teaching with video. *A. Pearson Education Limited. Practice of English language teaching*, 282.

Harmer, J. (2006). *How to teach writing*: Pearson Education India.

Harmer, J. (2007). *The practice of English language teaching*: Harlow: Pearson Longman.

Harris, A. D., McGregor, J. C., Perencevich, E. N., Furuno, J. P., Zhu, J., Peterson, D. E., & Finkelstein, J. (2006). The use and interpretation of quasi-experimental studies in medical informatics. *Journal of the American Medical Informatics Association, 13*(1), 16-23.

Hart, S. G., & Staveland, L. E. (1988). Development of NASA-TLX (Task Load Index): Results of empirical and theoretical research *Advances in psychology* (Vol. 52, pp. 139-183): Elsevier.

Heale, R., & Forbes, D. (2013). Understanding triangulation in research. *Evidence-Based Nursing, 16*(4), 98-98.

Hedlund, D. E. (1989). A Dialogue with Self: The Journal as an Educational Tool. *Journal of Humanistic Education and Development, 27*(3), 105-113.

Heinich, R., Molenda, M., Russell, J. D., & Smaldino, S. E. (2005). Instructional technology and media for learning. *New Jersey, Columbus. MULTI MEDIA PEMBELAJARAN, 141*.

Herron, C., Cole, S. P., Corrie, C., & Dubreil, S. (1999). The effectiveness of a video-based curriculum in teaching culture. *The Modern Language Journal, 83*(4), 518-533.

Holbrook, T. L. (1995). Finding subjugated knowledge: Personal document research. *Social Work, 40*(6), 746-751.

Homer, B. D., Plass, J. L., & Blake, L. (2008). The effects of video on cognitive load and social presence in multimedia-learning. *Computers in Human Behavior, 24*(3), 786-797.

Huang, H.-M., & Liaw, S.-S. (2005). Exploring users' attitudes and intentions toward the web as a survey tool. *Computers in Human Behavior, 21*(5), 729-743.

Huang, Y.-M., & Huang, Y.-M. (2015). A scaffolding strategy to develop handheld sensor-based vocabulary games for improving students' learning motivation and performance. *Educational Technology Research and Development, 63*(5), 691-708.

Inan, F. A., & Lowther, D. L. (2010). Factors affecting technology integration in K-12 classrooms: A path model. *Educational Technology Research and Development, 58*(2), 137-154.

Isman, A. (2012). Technology and Technique: An Educational Perspective. *Turkish Online Journal of Educational Technology-TOJET, 11*(2), 207-213.

Jimoyiannis, A., & Komis, V. (2006). Exploring secondary education teachers' attitudes and beliefs towards ICT adoption in education. *THEMES in Education, 7*(2), 181-204.

Jonassen, D., Peck, K., & Wilson, S. (1999). Learning with Technology. Englewood Cliffs, NJ.: Merrill: Prentice Hall.

Jones, L. C. (2003). Supporting listening comprehension and vocabulary acquisition with multimedia annotations: The students' voice. *Calico Journal,* 41-65.

Jones, L. C. (2008). Listening comprehension technology: Building the bridge from analog to digital. *Calico Journal, 25*(3), 400-419.

juang Wang, T. (2010). Educational benefits of multimedia skills training. *TechTrends, 54*(1), 47-57.

Kalyuga, S., Chandler, P., & Sweller, J. (1998). Levels of expertise and instructional design. *Human factors, 40*(1), 1-17.

Katchen, J. E. (2002). *Video in ELT-theoretical and pedagogical foundations.* Paper presented at the Proceedings of the 2002 KATE International Conference.

Kay, R. H. (2012). Exploring the use of video podcasts in education: A comprehensive review of the literature. *Computers in Human Behavior, 28*(3), 820-831.

Keller, J. M. (1983). Motivational design of instruction. *Instructional design theories and models: An overview of their current status, 1*(1983), 383-434.

Kersaint, G. (2003). Technology beliefs and practices of mathematics education faculty. *Journal of Technology and Teacher Education, 11*(4), 549-577.

Kessler, P. D., & Lund, C. H. (2004). Reflective journaling: Developing an online journal for distance education. *Nurse educator, 29*(1), 20-24.

Khine, M. S. (2001). Attitudes toward computers among teacher education students in Brunei Darussalam. *International Journal of Instructional Media, 28*(2), 147-147.

Kielinen, C. (1997). Journaling: an opportunity for reflection. *The ABNF Journal: official journal of the Association of Black Nursing Faculty in Higher Education, Inc, 8*(1), 8-10.

King, D. L. (2018). Types of Videos to Make. *Library Technology Reports, 54*(7), 12-19.

Koehler, M. J., Mishra, P., Hershey, K., & Peruski, L. (2004). With a little help from your students: A new model for faculty development and online course design. *Journal of Technology and Teacher Education, 12*(1), 25-55.

Koolstra, C. M., & Beentjes, J. W. (1999). Children's vocabulary acquisition in a foreign language through watching subtitled television programs at home. *Educational Technology Research and Development, 47*(1), 51-60.

Koskinen, P. S., Wilson, R. M., Gambrell, L. B., & Neuman, S. B. (1993). Captioned video and vocabulary learning: An innovative practice in literacy instruction. *The reading teacher, 47*(1), 36-43.

Koszalka, T. A. (2001). Effect of computer-mediated communications on teachers' attitudes toward using web resources in the classroom. *Journal of Instructional Psychology, 28*(2), 95-95.

Kozma, R. B. (1991). Learning with media. *Review of educational research, 61*(2), 179-211.

Krashen, S. (1992). The input hypothesis: An update. *Linguistics and language pedagogy: The state of the art*, 409-431.

Kroll, J. F., & Sunderman, G. (2003). Cognitive processes in second language learners and bilinguals: The development of lexical and conceptual representations. *The handbook of second language acquisition, 104129*.

Kuppens, A. H. (2010). Incidental foreign language acquisition from media exposure. *Learning, Media and Technology, 35*(1), 65-85.

Lancaster, G. A., Dodd, S., & Williamson, P. R. (2004). Design and analysis of pilot studies: recommendations for good practice. *Journal of evaluation in clinical practice, 10*(2), 307-312.

Larsen-Freeman, D., & Anderson, M. (2011). *Techniques & principles in language teaching*. Oxford: Oxford University Press.

Leadbeater, C. (2009). *We-think*: Profile books.

Lee, K.-w. (2000). English teachers' barriers to the use of computer-assisted language learning. *the internet TESL Journal, 6*(12), 1-8.

Leppink, J., Paas, F., Van der Vleuten, C. P., Van Gog, T., & Van Merriënboer, J. J. (2013). Development of an instrument for measuring different types of cognitive load. *Behavior research methods, 45*(4), 1058-1072.

Levy, R. (1994). Aging-associated cognitive decline. *International Psychogeriatrics, 6*(1), 63-68.

Lim, C. P., & Chai, C. S. (2008). Teachers' pedagogical beliefs and their planning and conduct of computer-mediated classroom lessons. *British journal of educational technology, 39*(5), 807-828.

Lodico, M., Spaulding, D., & Voegtle, K. (2006). Mixed methods and action research. *Methods in Educational Research from Theory to Practice, 290*.

Lonergan, J. (1992). Using a video camera to evaluate learners' classroom performance. *Video in second language teaching: Using, selecting, and producing video for the classroom*, 93-105.

Luna Scott, C. (2015). The Futures of Learning 3: what kind of pedagogies for the 21st century?

MacWilliam, I. (1986). Video and language comprehension. *ELT journal, 40*(2), 131-135.

Martínez-Flor, A., & Usó-Juan, E. (2006). Towards acquiring communicative competence through listening. *Current trends in the development and teaching of the four language skills*, 29-46.

Mautone, P. D., & Mayer, R. E. (2001). Signaling as a cognitive guide in multimedia learning. *Journal of educational psychology, 93*(2), 377.

Mayer, R. E. (2005). The Cambridge handbook of multimedia learning, from http://dx.doi.org/10.1017/CBO9780511816819

Mayer, R. E. (2011). Multimedia learning and games.

Mayer, R. E., & Moreno, R. (2002). Animation as an aid to multimedia learning. *Educational psychology review, 14*(1), 87-99.

Mayer, R. E., & Moreno, R. (2003). Nine ways to reduce cognitive load in multimedia learning. *Educational psychologist, 38*(1), 43-52.

Mayer, R. E., & Moreno, R. E. (2010). Techniques that reduce extraneous cognitive load and manage intrinsic cognitive load during multimedia learning.

Mayring, P. (2004). Qualitative content analysis. *A companion to qualitative research, 1*, 159-176.

McCormack, B., Hill, E., & Hill, L. (1997). *Conducting a survey: The SPSS workbook*: Cengage Learning EMEA.

McGovern, J. (1983). *Video Applications in English Language Teaching. ELT Documents 114*: ERIC.

McLoughlin, C., & Lee, M. J. (2008). The three p's of pedagogy for the networked society: Personalization, participation, and productivity. *International Journal of Teaching and Learning in Higher Education, 20*(1), 10-27.

Mekheimer, M. (2011). The impact of using videos on whole language learning in EFL context. *Arab World English Journal, 2*(2), 5-39.

Meskill, C. (1996). Listening skills development through multimedia. *Journal of Educational Multimedia and Hypermedia, 5*(2), 179-201.

Michelon, P. (2012). *Max your memory*. London: Dorling Kindersley.

Miller, G. A. (1956). The magical number seven, plus or minus two: Some limits on our capacity for processing information. *Psychological review, 63*(2), 81.

Mishan, F. (2005). *Designing authenticity into language learning materials*: Intellect Books.

Mousavi, S. Y., Low, R., & Sweller, J. (1995). Reducing cognitive load by mixing auditory and visual presentation modes. *Journal of educational psychology, 87*(2), 319.

Mumtaz, S. (2000). Factors affecting teachers' use of information and communications technology: a review of the literature. *Journal of information technology for teacher education, 9*(3), 319-342.

Murphy, J., Schegg, R., & Olaru, D. (2006). Investigating the evolution of hotel internet adoption. *Information Technology & Tourism, 8*(3-4), 161-177.

Neisser, U. (2014). *Cognitive psychology: Classic edition*: Psychology Press.

Nevgi, A., Virtanen, P., & Niemi, H. (2006). Supporting students to develop collaborative learning skills in technology-based environments. *British journal of educational technology, 37*(6), 937-947.

Ng, W., & Gunstone, R. (2003). Science and computer-based technologies: Attitudes of secondary science teachers. *Research in Science & Technological Education, 21*(2), 243-264.

Noor-Ul-Amin, S. (2013). An Effective Use of ICT for Education and Learning by Drawing on Worldwide Knowledge, Research, and Experience. *ICT as a Change Agent for Education. India: Department of Education, University of Kashmir*.

Nunan, D., & Bailey, K. M. (2009). *Exploring second language classroom research: A comprehensive guide*: Heinle, Cengage Learning Boston.

Onwuegbuzie, A. J., & Johnson, R. B. (2006). The validity issue in mixed research. *Research in the Schools, 13*(1), 48-63.

Orr, G. (2003). Diffusion of innovations, by Everett Rogers (1995). *Retrieved January, 21*, 2005.

Ovilia, R., & Asfina, R. (2017). 21st Century Learning: Is ICT Really Integrated In EFL Classroom or Merely Segregated Outside The Classroom? *EnJourMe (English Journal of Merdeka): Culture, Language, and Teaching of English, 2*(1), 1-17.

ÖZKAN, B. (2002). The use of video cases in teacher education. *TOJET: The Turkish Online Journal of Educational Technology, 1*(1).

Paas, F., Renkl, A., & Sweller, J. (2003). Cognitive load theory and instructional design: Recent developments. *Educational psychologist, 38*(1), 1-4.

Paas, F. G. (1992). Training strategies for attaining transfer of problem-solving skill in statistics: A cognitive-load approach. *Journal of educational psychology, 84*(4), 429.

Paas, F. G., & Van Merriënboer, J. J. (1993). The efficiency of instructional conditions: An approach to combine mental effort and performance measures. *Human factors, 35*(4), 737-743.

Paas, F. G., Van Merriënboer, J. J., & Adam, J. J. (1994). Measurement of cognitive load in instructional research. *Perceptual and motor skills, 79*(1), 419-430.

Paivio, A. (1978). A dual coding approach to perception and cognition. *Modes of perceiving and processing information*, 39-51.

Patel, C. (2013). Use of multimedia technology in teaching and learning communication skill: An analysis. *International Journal of Advancements in Research & Technology, 2*(7), 116-123.

Pelgrum, W. J., & Law, N. (2003). *ICT in education around the world: Trends, problems and prospects*: UNESCO: International Institute for Educational Planning.

Pelton, R. H., Allen, L. H., & Nugent, H. M. (1982). Additives for increased retention and pitch control in paper manufacture: Google Patents.

Pisarenko, V., & Krasnoshchekova, G. (2016). *Video in teaching.* Paper presented at the 2016 IEEE 10th International Conference on Application of Information and Communication Technologies (AICT).

Plass, J. L., Chun, D. M., Mayer, R. E., & Leutner, D. (1998). Supporting visual and verbal learning preferences in a second-language multimedia learning environment. *Journal of educational psychology, 90*(1), 25.

Plass, J. L., Chun, D. M., Mayer, R. E., & Leutner, D. (2003). Cognitive load in reading a foreign language text with multimedia aids and the influence of verbal and spatial abilities. *Computers in Human Behavior, 19*(2), 221-243.

Polit, D. F., & Beck, C. T. (2008). *Nursing research: Generating and assessing evidence for nursing practice*: Lippincott Williams & Wilkins.

Prensky, M. (2001). Digital natives, digital immigrants. *On the horizon, 9*(5).

Redfield, M. R. (2003). The Use of Transcripts with Audio Tapes: Is There a Best Presentation Order?(Studies Presented to Prof. Shuichi Fujimoto Prof. Kazuo Matsubara on Their Seventieth Birthday and to Prof. Takeshi Kamijima on his Retirement). 大阪経大論集, *53*(6), 293-300.

Riasati, M. J., Allahyar, N., & Tan, K.-E. (2012). Technology in language education: Benefits and barriers. *Journal of education and practice, 3*(5), 25-30.

Richards, G. (2007). Culture and authenticity in a traditional event: The views of producers, residents, and visitors in Barcelona. *Event Management, 11*(1-2), 33-44.

Richards, R. E. (2007). *Everyday creativity and new views of human nature: Psychological, social, and spiritual perspectives*: American Psychological Association.

Riding, R., Rayner, S., & Banner, G. (2000). The effect of cognitive style and gender on second-language learning performance in 12-year-old pupils. *Manuscript submitted for publication.*

Rosenthal, J. W. (2013). *Handbook of undergraduate second language education*: Routledge.

Ruthven, K., Hennessy, S., & Deaney, R. (2005). Incorporating Internet resources into classroom practice: pedagogical perspectives and strategies of secondary-school subject teachers. *Computers & Education, 44*(1), 1-34.

Samak, A., & Tawfik, Z. (2006). Exploration of Jordanian English Language Teachers' Attitudes, Skills, and Access as Indicator of Information and Communication Technology Integration in Jordan.

Sang, G., Valcke, M., Van Braak, J., & Tondeur, J. (2010). Student teachers' thinking processes and ICT integration: Predictors of prospective teaching behaviors with educational technology. *Computers & Education, 54*(1), 103-112.

Sankaran, S. R., Sankaran, D., & Bui, T. X. (2000). Effect of Student attitude to Course Format on Learning Performance: An Empirical Study in Web vs. *Journal of Instructional Psychology, 27*(1).

Sarani, A., Behtash, E. Z., & Arani, S. M. N. (2014). The Effect of Video-Based Tasks in Listening Comprehension of Iranian Pre-intermediate EFL Learners. *Gist: Education and Learning Research Journal*(8), 29-47.

Schär, S. G., Kaiser, J., & Krueger, H. (1999). *Multimedia: the effect of picture, voice & text for the learning of concepts and principles.* Paper presented at the Proceedings of HCI International (the 8th International Conference on Human-Computer Interaction) on Human-Computer Interaction: Ergonomics and User Interfaces-Volume I-Volume I.

Schmeck, A., Opfermann, M., Van Gog, T., Paas, F., & Leutner, D. (2015). Measuring cognitive load with subjective rating scales during problem solving: differences between immediate and delayed ratings. *Instructional Science, 43*(1), 93-114.

Schmid, E. C. (2011). Video-stimulated reflection as a professional development tool in interactive whiteboard research. *ReCALL, 23*(3), 252-270.

Schmidt-Weigand, F., & Scheiter, K. (2011). The role of spatial descriptions in learning from multimedia. *Computers in Human Behavior, 27*(1), 22-28.

Schnotz, W., & Kürschner, C. (2007). A reconsideration of cognitive load theory. *Educational psychology review, 19*(4), 469-508.

Schnotz, W., & Rasch, T. (2005). Enabling, facilitating, and inhibiting effects of animations in multimedia learning: Why reduction of cognitive load can have negative results on learning. *Educational Technology Research and Development, 53*(3), 47.

Sedgwick, P. (2010). Independent samples t test. *BMJ, 340.*

Shapka, J. D., & Ferrari, M. (2003). Computer-related attitudes and actions of teacher candidates. *Computers in Human Behavior, 19*(3), 319-334.

Sharma, R. (2003). *Barriers in using technology for education in developing countries.* Paper presented at the International Conference on Information Technology: Research and Education, 2003. Proceedings. ITRE2003.

Sherman, J. (2003). *Using authentic video in the language classroom*: Ernst Klett Sprachen.

Sherman, J. (2010). *Using authentic video in the language classroom*. Cambridge [etc.: Cambridge University Press.

Shrestha, P. (2017). Sensory Memory. Retrieved july 12, 2019 https://www.psychestudy.com/cognitive/memory/sensory

Simon, M. K., & Goes, J. (2011). What is phenomenological research. *Retrieved from*.

Skulmowski, A., & Rey, G. D. (2017). Measuring cognitive load in embodied learning settings. *Frontiers in psychology, 8*, 1191.

Smith, M. E. (2008). *Factors in the measurement of cognitive load of multimedia learning.* University of Pretoria.

Sobel, C. P., & Li, P. (2013). *The Cognitive Sciences An Interdisciplinary Approach*.

Solanki, D. S., & Phil, M. (2012). *Use of Technology in English Language Teaching and Learning.* Paper presented at the International Conference on Language.

South, J. B., Gabbitas, B., & Merrill, P. F. (2008). Designing video narratives to contextualize content for ESL learners: a design process case study. *Interactive Learning Environments, 16*(3), 231-243.

Spielberger, C. D. (2004). *Encyclopedia of applied psychology*. Oxford; Boston: Elsevier Academic Press.

Stempleski, S. (1989). The Media: Catalysts for Communicative Language Learning. *TESOL Quarterly, 23*(1), 142-143.

Sternberg, S. (1966). High-speed scanning in human memory. *Science, 153*(3736), 652-654.

Stockwell, G. (2007). A review of technology choice for teaching language skills and areas in the CALL literature. *ReCALL: the Journal of EUROCALL, 19*(2), 105.

Stoller, F. (1988). Films and Videotapes in the ESL/EFL Classroom.

Susikaran, R. (2013). Integrating ICT into Teaching & Learning: A 21st Century Technology Tool for Continuing Education. *International Journal of English and Education, 2*(1), 289-295.

Sweller, J. (1988). Cognitive load during problem solving: Effects on learning. *Cognitive science, 12*(2), 257-285.

Sweller, J. (1994). Cognitive load theory, learning difficulty, and instructional design. *Learning and instruction, 4*(4), 295-312.

Sweller, J. (1999). *Instructional design.* Paper presented at the Australian educational review.

Sweller, J. (2010). Element interactivity and intrinsic, extraneous, and germane cognitive load. *Educational psychology review, 22*(2), 123-138.

Sweller, J. (2018). Measuring cognitive load. *Perspectives on medical education, 7*(1), 1-2.

Sweller, J., Ayres, P., & Kalyuga, S. (2011). Intrinsic and extraneous cognitive load *Cognitive load theory* (pp. 57-69): Springer.

Sweller, J., Van Merrienboer, J. J., & Paas, F. G. (1998). Cognitive architecture and instructional design. *Educational psychology review, 10*(3), 251-296.

Tappen, R. M. (2016). *Advanced nursing research: From theory to practice*: Jones & Bartlett Publishers.

Tapscott, D. (1998). *Growing up digital* (Vol. 302): McGraw-Hill Companies San Francisco.

Tashakkori, A., & Creswell, J. W. (2007a). Exploring the nature of research questions in mixed methods research: Sage Publications Sage CA: Los Angeles, CA.

Tashakkori, A., & Creswell, J. W. (2007b). The new era of mixed methods: Sage Publications.

Teo, T. (2006). Attitudes toward computers: A study of post-secondary students in Singapore. *Interactive Learning Environments, 14*(1), 17-24.

Teo, T. (2008). Assessing the computer attitudes of students: An Asian perspective. *Computers in Human Behavior, 24*(4), 1634-1642.

Terrell, T. D. (1993). Comprehensible input for intermediate foreign language students via video. *IALLT Journal of Language Learning Technologies, 26*(2), 17-24.

Tezci, E. (2009). Teachers' effect on ICT use in education: The Turkey sample. *Procedia-Social and Behavioral Sciences, 1*(1), 1285-1294.

Thao, V. (2003). The contribution of multimedia tools to EFL settings unfamiliar with technology. *Asian EFL Journal, 5*(3), 1-14.

Thomas, P. R., & McKay, J. B. (2010). Cognitive styles and instructional design in university learning. *Learning and Individual Differences, 20*(3), 197-202.

Thornton, D. E., & Kaya, E. (2013a). *All the world wide web's a stage.* Paper presented at the Aslib Proceedings.

Thornton, D. E., & Kaya, E. (2013b). *All the world wide web's a stage: Improving students' information skills with dramatic video tutorials.* Paper presented at the Aslib Proceedings.

Tight, M. (2010). Are academic workloads increasing? The post-war survey evidence in the UK. *Higher Education Quarterly, 64*(2), 200-215.

Timuçin, M. (2006). Implementing CALL in an EFL context. *ELT journal, 60*(3), 262-271.

Tracy, J. P., & Albers, M. J. (2006). *Measuring cognitive load to test the usability of web sites.* Paper presented at the Annual Conference-society for technical communication.

Välimäki, T., Vehviläinen-Julkunen, K., & Pietilä, A. M. (2007). Diaries as research data in a study on family caregivers of people with Alzheimer's disease: methodological issues. *Journal of Advanced Nursing, 59*(1), 68-76.

Van Braak, J. (2001). Individual characteristics influencing teachers' class use of computers. *Journal of educational computing research, 25*(2), 141-157.

Van Duzer, E. (1997). Exploring Technology Education.

Van Horn, R., & Freed, S. (2008). Journaling and dialogue pairs to promote reflection in clinical nursing education. *Nursing education perspectives, 29*(4), 220-225.

VandenBos, G. R. (2007). *APA dictionary of psychology*: American Psychological Association.

Verbrugge, L. M. (1980). Health diaries. *Medical care, 18*(1), 73-95.

Wang, J., & Hartley, K. (2003). Video technology as a support for teacher education reform. *Journal of Technology and Teacher Education, 11*(1), 105-138.

Wang, T. (2010). Educational benefits of multimedia skills training. *TechTrends, 54*(1), 47-57.

Watkins, J., & Wilkins, M. (2011). Using YouTube in the EFL classroom. *Language Education in Asia, 2*(1), 113-119.

Winke, P., Gass, S., & Syodorenko, T. (2010). The effects of captioning videos used for foreign language listening activities. *Language Learning & Technology, 14*(1), 65-86.

Wixted, J. T. (2004). The psychology and neuroscience of forgetting. *Annu. Rev. Psychol., 55*, 235-269.

Woodrow, J. E. (1992). The influence of programming training on the computer literacy and attitudes of preservice teachers. *Journal of research on Computing in Education, 25*(2), 200-219.

Wright, L. (1976). *Teleological explanations: An etiological analysis of goals and functions*: Univ of California Press.

Yang, H.-Y. (2014). Does multimedia support individual differences?–EFL learners' listening comprehension and cognitive load. *Australasian Journal of Educational Technology, 30*(6).

Yapici, I. U., & Akbayin, H. (2012). The Effect of Blended Learning Model on High School Students' Biology Achievement and on Their Attitudes towards the Internet. *Turkish Online Journal of Educational Technology-TOJET, 11*(2), 228-237.

Yin, R. K. (2015). *Qualitative research from start to finish*: Guilford publications.

Yuksel, D., & Tanriverdi, B. (2009). Effects of watching captioned movie clip on vocabulary development of EFL learners. *Online Submission, 8*(2).

Yusuf, M. O. (2005). Information and communication technology and education: Analysing the Nigerian national policy for information technology. *International education journal, 6*(3), 316-321.

Zanón, N. T. (2006). Using subtitles to enhance foreign language learning. *Porta Linguarum: revista internacional de didáctica de las lenguas extranjeras*(6), 4.

Zemin, J. (2009). *On the development of China's information technology industry*: Academic Press.

Appendices

Appendix A

PEOPLE'S DEMOCRATIC REPUBLIC OF ALGERIA

MINISTRY OF HIGHER EDUCATION AND SCIENTIFIC RESEARCH

UNIVERSITY CENTER OF SI EL HAOUES- BARIKA- BATNA

INSTITUTE OF LETTERS AND FOREIGN LANGUAGES

DEPARTMENT OF ENGLISH LANGUAGE AND LITERATURE

Name: Asma HOUICHI
E-mail: asmahouichi.kh@gmail.com
Phone Number: 06.99.76.12.88

Date: 05/10/2020
To: The Head of the Department of English Language

Dear Rida BOUCHAGRA

I am a Doctoral student in English language at the University of Abd El Hamid Ibn Badis, Mostaganem. I was a student at the University of Mohammed Lamine Debaghine, Sétif. From there I got my licence and master degree.
As part of my Doctoral degree I am carrying out a research study entitled as:
"**Investigating the Effects of Video-Based Learning on Students' Cognitive Load**".
Under the supervision of Dr. Dallel Sarnou.
The purpose of this research study is to investigate the effectiveness of using Video-based learning as a tool to support teaching and learning methods and strategies that will reduce students' cognitive overload; thereby, improving their learning.

I am writing to enquire whether you would give me permission to recruit participants from among the students whom I am teaching currently enrolled at your university. I would need to approach these students and ask them if they would be willing to take part in this study.
If you have any comments or questions about this research please could you contact me using the contact details provided earlier. This research has been approved by Abd El Hamid Ibn Badis, Mostaganem University Scientific Committee.

If you would be willing to give me permission I would appreciate it if you could sign the enclosed form. Many thanks in advance for your consideration of this project. Please let me know if you require further information.

Regards, **Date:**
Asma HOUICHI **Signature**

Appendix B

Placement Test

Placement Test A

Choose the correct answer.

1 He … my friend.
a) am b) is c) are d) be

2 We … English.
a) isn't b) not c) aren't d) don't

3 … they English?
a) Do b) Is c) Are d) Be

4 A: Are you a student? B: Yes, I … .
a) are b) is c) be d) am

5 A: … your name? B: Maria.
a) What's b) Who's c) Is it d) What call

6 A: … is that man? B: My father.
a) Who b) Whom c) What d) Which

7 A: … are you? B: Ten.
a) How b): What age c): How much d) How old

8 A: … girls are here? B: Eight.
a) How much b) How many c) Which d) What

9 It's … house.
a) they b) them c) theirs d) their

10 … are friends.
a) We b) He c) Our d) Them

11 My rabbit is white. … name is Snowy.
a) It's b) It c) Its d) It is

12 … car is black.
a) Theirs b) They c) Them d) Their

13 They like … .
a) we b) us c) our d) ours

14 The party is … Monday.
a) to b) on c) in d) at

15 They are … London.
a) to b) on c) by d) in

16 I go to bed … 10 o'clock.
a) in b) for c) at d) to

17 His birthday is … March.
a) on b) to c) in d) at

18 Susan is … home.
a) to b) at c) in d) by

19 … down!
a) Sit b) Sat c) Sitting d) To sit

20 … talk!
a) Don't b) Not c) No d) Didn't

21 Come here and look at … painting.
a) those b) that c) these d) this

22 Who are … boys over there?
a) these b) this c) those d) that

23 Mrs Brown is … teacher.
a) – b) an c) a d) any

24 Here is … apple for you.
a) an b) a c) – d) any

25 New York is in … United States of America.
a) the b) – c) an d) a

26 This is a photo of our two dogs. My dog is … old dog near the tree.
a) an b) – c) a d) the

27 A: Where's dad? B: In … garden.
a) one b) a c) – d) the

28 Three … .
a) box b) boxs c) boxes d) boxies

29 Two … .
a) woman b) women c) womans d) womens

30 Four … .
a) foot b) foots c) feet d) feets

31 She is … .
a) Britain b) England c) the UK d) British

32 Is it hot in … ?
a) Greece b) Greek c) the Greece d) Greeks

33 He is … .
a) tall b) long c) up d) high

34 There's a big blackboard in our … .
a) bedroom b) kitchen c) garden d) classroom

35 3 + 2 = … .
a) five b) fifth c) fife d) fifty

36 (1st) first, (2nd) second, (3rd) … , (4th) fourth
a) three b) third c) thirteen d) thirteenth

37 It's (10.30) … .
a) thirty past ten b) thirty to eleven
c) half past ten d) half to eleven

38 It's (1.45) … .
a) quarter past one b) fifteen to two
c) forty–five past one d) quarter to two

39 It's (2.40) … .
a) forty past two b) twenty to three
c) twenty past two d) forty to three

40 A: How are you? B: …
a) Thank you. b) Fine, thanks. c) How are you?
d) I'm Maria.

41 A: Can he sing? B: No, he … .
a) can't b) isn't c) not d) doesn't

42 They can … .
a) dancing b) to dance c) dance d) danced

43 We like … .
a) walk b) to walking c) walking d) walked

44 Can he ride … bicycle.
a) the b) a c) – d) on

45 I've got … headache.
a) a b) an c) – d) the

46 A: … is it? B: It's five euros.
a) How many b) How c) What cost d) How much

47 A: What …? B: They're doctors.
a) do they b) are they doing c) do they do
d) they do

48 A: … do you watch TV? B: Every evening.
a) How much b) How often c) How many d) Why

49 A: … bag is this? B: It's my bag.
a) Whom b) Who c) Which d) Whose

50 I … a computer.
a) haven't got b) not have c) don't got d) don't

2

51 A: Has she got a brother? B: Yes, she … .
a) has b) got c) have d) does

52 … three cinemas here.
a) They are b) There are c) There is d) It is

53 Is there a park here? No, …
a) it isn't b) there aren't c) there isn't d) they aren't

54 There are … books on the table.
a) some b) one c) any d) a lot

55 We haven't got … red pencils.
a) much b) some c) a d) any

56 Is there … water?
a) a b) any c) many d) some

57 He … computer games every day.
a) play b) playing c) plays d) is playing

58 I … speak Italian.
a) not b) don't c) doesn't d) no

59 Do they play football at school? Yes, they … .
a) play b) are playing c) do d) can

60 I … to school.
a) usually walk b) am usually walking c) walk usually d) am walking usually

61 They … late.
a) aren't hardly ever b) hardly are ever c) ever hardly are d) are hardly ever

62 A: What are you doing? B: I … a book.
a) are reading b) reading c) read d) am reading

63 He … football at the moment.
a) playing b) is playing c) plays d) played

64 A: Are they watching TV? B: Yes, they … .
a) are b) do c) watch d) watching

65 I … chess with my father.
a) do b) make c) play d) have

66 I … exercises every day.
a) make b) play c) go d) do

67 I … a shower every morning.
a) have b) make c) do d) go

68 I … the guitar.
a) do b) make c) have d) play

69 We … at a party last Saturday.
a) were b) are c) was d) be

70 A: Was he tired? B: Yes, he … .
a) tired b) was c) does d) is

71 … a good film on TV last night?
a) Was b) Were there c) Is it d) Was there

72 This is … bag.
a) Mike b) Mike's c) Mikes' d) Mikes

73 Where are the … fathers?
a) boy's b) boy' c) boys' d) boys

74 The black car is … .
a) ours b) our c) ours' d) our's

75 That's … book.
a) mine b) me c) my d) hers

76 He's good … Maths.
a) for b) at c) with d) on

77 Are you interested … music?
a) with b) in c) for d) on

78 I go to school … train.
a) in b) with c) on d) by

79 We went … foot.
a) on b) with c) by d) to

80 The cinema is opposite … the bank.
a) to b) from c) of d) –

81 The school is … the left.
a) on b) at c) in d) by

82 They play tennis …
a) good b) best c) well d) goodly

83 He's a … driver.
a) slow b) slowly c) slowest d) slowed

84 It's an … film.
a) excited b) exciting c) excitedly d) excites

85 He's … boy in our class.
a) taller b) the tallest c) tallest d) tall

86 Maria is … Ann.
a) as intelligent b) the most intelligent c) more intelligent d) more intelligent than

87 A: Where's her book? B: … is on the table.
a) It b) This c) They d) That

88 She can sing … she can't dance.
a) and b) so c) but d) then

89 They … French last year.
a) don't study b) didn't studied c) didn't study d) not studied

90 A: Did you have breakfast this morning? B: Yes, I … .
a) have b) had c) did have d) did

91 I … John yesterday.
a) see b) saw c) seed d) am seeing

92 Maria is eight years old. She … drive a car.
a) haven't b) can't c) must d) not

93 I … my grandparents next week.
a) go to visit b) am going visit c) go visiting d) am going to visit

94 A: Is she going to sing? B: Yes, she … .
a) goes b) is c) sings d) is going

95 It's very … in April in my country.
a) rainy b) rain c) rains d) rained

96 My father is a … .
a) science b) scientific c) scientist d) sciences

97 … are my favourite vegetables.
a) Carrots b) Apples c) Eggs d) Biscuits

98 There are two swimming … in the town.
a) parks b) lakes c) places d) pools

99 A: I won a tennis competition yesterday. B: …
a) Be careful. b) I'm sorry. c) Well done. d) Very well.

100 A: Would you like to come to my party? B: Yes, … .
a) I'd love to b) I love it c) I come d) I like

Appendix C

Consent to Participate in a Research Study

TITLE OF STUDY

"Investigating the Effects of Video-Based Learning on Students' Cognitive Load"

PRINCIPAL INVESTIGATOR

Department of English Language and Literature
Name: Houichi Asma

E-mail: asmahouichi.kh@gmail.Com

Phone number: 0699761288

INTRODUTION

This letter is an invitation to consider participating in a study I am conducting as part of my Doctoral degree in the Department of the English Language at Abd El Hamid Ibn Badis University under the supervision of Dr. Dallel Sarnou.

Please read the following information carefully.

PURPOSE OF STUDY

The purpose of this study is to investigate the effects of Video-Based Learning as a tool to support teaching/learning methods and strategies that will improve the students' cognitive competencies.

BENEFITS

There will be direct benefits to you for your participation in this study; you will have the opportunity to discover a new method for learning through Videos. However, your participation may provide me with a better understanding of my topic and huge help in my study.

CONFIDENTIALITY

Your responses to this research study will be anonymous and participant data will be kept confidential.

- *Assigning code names/numbers for participants that will be used on all research notes and documents.*
- *Keeping the identifying participant information in the personal possession of the researcher.*

CONTACT INFORMATION

If you have questions about this study you may contact the researcher whose contact information is provided on the first page.

CONSENT

I have read and I understand the provided information and have had the opportunity to ask questions. I understand that my participation will be beneficial for this study. I agree to take part of in this study.

*Participant's signature*_____*Date* _____

*Investigator's signature*_____*Date* _____

Appendix D

Post-test of the Pilot study

"How can more women get into politics?"

Activity One: Complete the sentences with words from the box.

percentage	**prime**	**minister**		**right to vote**
targets	**election**	**controversial**	**seat**	**in office**
parliament	**equality**			

1. In most countries, all men and women aged 18 and over have the …… .
2. Often when a country chooses new politicians, people vote in an …… .
3. A ..... is an amount expressed as a number out of a hundred (%).
4. A ..... is the group of people who make the laws of the country.
5. In some countries the leader of the government is called the …… .
6. When a politician has a job in the government, we can say they are …… .
7. Some countries have..... of the number of women they aim to have in parliament.
8. If a subject is ....., people have strong opinions and disagree about it.
9. Having the same number of men and women in parliament means there is gender …… .
10. A parliamentary …… is the official position that someone has in a parliament.

Activity Two: Choose the best answer.

1. When were women in Saudi Arabia first allowed to vote in elections?

a. 1985 **b. 2005** **c. 2015**

2. What happened in the election in India in 2019?

a. Approximately the same number of men and women voted.

b. More women than men voted.

c. More men than women voted.

3. Which was the first country where women had the right to vote?

a. Finland **b. New Zealand** **c. India**

4. When did New Zealand's prime minister have a baby?

a. While she was working in her office.

b. While she was at hospital.

c. During the time that she had the job of prime minister.

5. Who is the youngest woman ever to be elected prime minister?

a. Jacinda Ardern of New Zealand

b. Sanna Marin of Finland

c. Margaret Thatcher of the UK

6. How many female prime ministers has New Zealand had?

a. one **b. two** **c. three**

7. Which country has the most women in politics?

a. Rwanda **b. South Africa** **c. India**

8. What was Rwanda's goal in 2003? a. To get more women to vote in elections. b. To get more women to become politicians in parliament. c. To get more young people to become politicians.

Activity Three: Complete the sentences with words from the box.

first	**third**		**two-thirds**	**more**
percentage	**30**	**34**		**a small share**

1. In India's election in 2019, the same..... of women voted as men.

2. In India in 2019, ... female members of parliament were elected than ever before.

3. New Zealand was the .....country to give women the right to vote.

4. Sanna Marin was …… years old when she became prime minister of Finland.

5. Jacinda Ardern is New Zealand's..... woman prime minister.

6. In Rwanda in the 1990s, women only made up …… of their parliamentary seats.

7. In 2003, Rwanda set a goal to make …… per cent of their elected politicians women.

8. Today, women make up nearly..... of the Rwandan parliament.

Good Luck

Appendix E

First Post-test

"Can and will: Gwyn Haslock"

Activity One: Match the vocabulary with the correct definition and write.

1…….. to paddle	**a.** an event where you compete against others to win
2…….. a category	**b.** a person who rides on a wave on a special board
3…….. a surfer	**c.** a person on a beach or at a swimming pool who watches the swimmers to make sure they are safe and not in danger
4…….. a wetsuit	**d.** water that moves across the surface of an area of water
5…….. a competition	**e.** a long, narrow board made of wood for riding on waves
6…….. a surfboard	**f.** a piece of clothing, usually made from rubber, that covers the whole body and keeps you warm in the sea
7…….. a lifeguard	**g.** a group of people or things that are similar in some way
8…….. waves	**h.** to push a pole or your hands through water in order to move

Activity Two: Circle the best answer to these questions.

1. Who encouraged Gwyn to do sport?

a. Her mother **b. Her father** **c. Her brother**

2. When did Gwyn use wooden surfboards?

a. In the 50s **b. In the 60s** **c. In the 70s**

3. What are wooden surfboards called today?

a. Body boards **b. Belly boards** **c. Heavy boards**

4. Who first brought down the longboards which are also known as Malibu boards?

a. Her brother **b. The lifeguards** **c. Trevor Roberts**

5. What year did Gwyn do her first competition?

a. 1965 **b. 1960** **c. 1975**

6. When was Gwyn the first ladies' British Champion?

a. 1965 **b. 1966** **c. 1967**

7. When did Gywn get her first surfboard?

a. Over 50 years ago **b. Over 70 years** **c. Over 60 years ago**

8. Nowadays, who gives strange looks to Gywn when she surfs?

a. Old peop **b. Young people** **c. Other surfers**

Good Luck

Appendix F

Second Post-test

"The BFG"

Activity One: Match the vocabulary with the correct definition

1…….. a runt	**a.** someone who eats human beings
2…….. a giant	**b.** thoughts and feelings you have when you are asleep
3…….. to crunch	**c.** to make someone feel frightened
4…….. a cannibal	**d.** a huge person who is much bigger than other people – often found in fairy tales
5…….. a dream	**e.** having a very nice taste or smell
6…….. delicious	**f.** an animal which is unusually small for its kind
7…….. to scare	**g.** to eat something quickly and often noisily
8…….. to gobble	**h.** to bite hard food, causing it to make a loud noise

Activity Two: Circle True or False for these sentences.

1. Sophie thinks that the BFG is going to eat her.	**True**	**False**
2. Steven Spielberg is the director of the film.	**True**	**False**
3. BFG stands for the Bad Fat Giant.	**True**	**False**
4. The film is based on the book by Roald Dahl.	**True**	**False**
5. The BFG catches dreams.	**True**	**False**
6. All the giants in the story are good, like the BFG.	**True**	**False**
7. The BFG has a plan.	**True**	**False**
8. Sophie and the BFG become good friends and have a lot of adventures together.	**True**	**False**

Good Luck

Appendix G

Third Post-test

"Windsor Castle"

Activity One: Match the vocabulary with the correct definition

1…….. a monument **a.** to live in a place

2…….. a monarch **b.** a building where someone lives

3…….. an occasion **c.** the place where someone is going

4…….. a residence **d.** a king or queen

5…….. a restoration **e.** metal clothing that soldiers wore in the past to protect their bodies

6…….. a destination **f.** the process of returning something to its original condition by repairing and cleaning it

7…….. to inhabit **g.** an important event or ceremony

8…….. armour **h.** an old building that is important in history

Activity Two: Circle the best answer to these questions.

1. Which of the following is NOT a function of Windsor Castle?

a. The Queen's home **b. A restoration project** **c. A national monument**

2. Who built Windsor Castle?

a. William the Conqueror **b. Henry VIII** **c. Queen Victoria**

3. What did George IV do at Windsor Castle

a. He opened the state apartments to the public.

b. He doubled the height of the castle's round tower.

c. He paid for the restoration of the castle after the fire.

4. What can you find at St. George's Chapel?

a. Treasures collected by monarchs

b. The shields and armour of over a thousand Garter Knights

c. The armour of Henry VIII

5. What was the result of the restoration project?

a. It put out the fire.

b. It returned the castle to exactly how it looked before the fire.

c. It repaired the damage and added new interiors.

6. Is Windsor a working castle?

a. Yes, it is the official residence of the Queen.

b. Yes, but only for state ceremonies.

c. No, it is only a museum.

Activity Three: Circle the things that can be found in Windsor Castle.

paintings	**shells**	**armour**	**a doll's house**
a monument	**tapestries**	**porcelain**	**firefighters**

Activity Four: Match the numbers with the things they describe

1…….. The approximate number of visitors to Windsor Castle each year.	**a. 39**
2…….. The distance the castle is from London in miles.	**b. 11th**
3…….. The century the castle was built.	**c. IV**
4…….. The number of monarchs who have lived in Windsor Castle.	**d. 1848**
5…….. The monarch George who gave Windsor its famous skyline.	**e. 200**
6 ……. The year that Queen Victoria opened the state apartments to the public.	**f. 1992**
7…….. The year a fire swept through the castle.	**g. million**
8…….. The number of firefighters it took to put out the fire at the castle.	**h. 23**

Good Luck

Appendix H

Fourth Post-test
"Yusra Mardini, a young refugee"

Activity One: Match the vocabulary with the correct definition

1…….. a border	**a.** a sports trainer
2…….. a disaster	**b.** a sports competition held every four years
3…….. to escape	**c.** to get away
4…….. the Olympics	**d.** to get on a boat
5…….. a coach	**e.** a sudden accident that causes a lot of damage or Kills a lot of people
6…….. to board a boat	**f.** to depend on
7…….. dignity	**g.** a line separating two countries
8…….. to rely on	**h.** a sense you have of your own value and that other people respect you

Activity Two: Circle the best option to complete these sentences.

1. Yusra used to have lots of friends, loved going to school and to the:

gym / pool / extra classes .

2. Her swimming coach told her she could compete in the:

Olympics / FIFA World Cup / World Championships one day!

3. Her life was in danger because of the: **war / earthquake / flood .**

4. Yusra and her

little / middle / big sister, Sara, travelled to Turkey. The plan was for her family to follow.

5. Yusra and her sister were:

unable to swim / weak swimmers / strong swimmers and helped to save the lives of everyone in the boat.

6. They swam and pulled the boat for more than:

three and a half / four and a half / five and a half hours.

7. Yusra made it to Europe and arrived at her new home in: **Turkey / Germany / Greece .**

8. Yusra is proud to be a goodwill ambassador for the UN Refugee Agency (UNHCR) and she represents people who are all fleeing:

violence / disease / natural disasters .

Good Luck

Appendix I

Fifth Post-test

"International Women's Day – We are women"

Activity One: Match the definitions (a–j) with the vocabulary (1–10).

1. …… bold **a.** someone you have a special relationship with and you love very much
2. …… flawless **b.** not frightened of danger
3. …… an instigator **c.** someone or something that changes a situation in a significant way
4. …… a game changer **d.** perfect or without mistakes
5. …… a soulmate **e.** a person who causes something to happen
6. …… an executive **f.** the member of a family who earns the money that the family needs
7. …… a breadwinner **g.** a person in a company who makes decisions and puts them into action
8. …… to get your hands **h.** to do hard work, especially physical work

dirty

9. …… to keep it together **i.** to be the one that holds a group of people together
10. …… to be the glue **j.** to stay calm, often in a difficult situation

Activity Two: Complete the sentences from the video with words from the box.

fast	**nails**	**hands**	**game**
together	**listeners**	**women**	**each other**

1. We're teachers and very good …… .
2. We are ..... changers.
3. We support …… .
4. We go …… .
5. We get our .....dirty.
6. We paint our …… .

7. We keep it …… .

8. We are …… .

Activity Three: Write the words in the correct group.

teacher	**fast**	**engineer**	**strong**	**data**
scientist	**sister**	**daughter**	**lawyer**	**bold**
executive	**fearless**	**wife**	**girlfriend**	**flawless**
soulmate				

Family and friends	**Jobs**	**Adjectives**

Good Luck

Appendix J

Sixth Post-test

”Routemaster’’

Activity One: Match the vocabulary with the correct definition

1…….. packed	**a.** full of people
2…….. a grand	**b.** one thousand pounds
3…….. a vehicle	**c.** quite, but not very
4…….. overhyped	**d.** when you travel from one place to another
5…….. pretty	**e.** an idea
6…….. a reaction	**f.** the way someone acts or feels in response to something
7…….. a concept	**g.** a machine (like a car or bus) that takes people from one place to another
8…….. a journey	**h.** when something is advertised or praised more than it deserves in order to make people excited about it

Activity Two: Circle True or False for these sentences.

1. Sonya is excited about the new Routemaster bus.	**True**	**False**
2. The Routemaster isn't very crowded.	**True**	**False**
3. The Routemaster is one of the most expensive buses ever	**True**	**False**
4. People didn't have to wait a long time for the bus.	**True**	**False**
5. None of the passengers had any complaints.	**True**	**False**
6. Overall, people have had a positive reaction to the Routemaster.	**True**	**False**
7. The Routemaster is environmentally friendly.	**True**	**False**
8. Sonya thinks the Routemaster is overhyped, but nice.	**True**	**False**

Activity Three: Circle **Yes** for all the complaints people make about the Routemaster in the video.

1. It was late.	**Yes**	**No**
2. It’s dirty.	**Yes**	**No**
3. There isn't enough head room.	**Yes**	**No**
4. There isn't enough leg room.	**Yes**	**No**

5. It’s boring. **Yes** **No**

6. It’s too expensive. **Yes** **No**

7. The temperature isn't right. **Yes** **No**

8. It's overhyped. **Yes** **No**

Activity Four: Complete the sentences with a phrasal verb from the box.

sort out	**make of**	**get on**
come down	**get off**	

1. Sonya doesn’t know if she should_____the bus in the front or the back.

2. Would you_____especially to take the new Routemaster bus?

3. One passenger complained that somebody needed to_____the heating on the bus.

4. When someone asks you what you_____something, they want to know your opinion about it.

5. When you arrive at your stop, you need to_____the bus.

Good Luck

Appendix K

The NASA Task Load Index

Name:	Subject:	Date:

Please select the column that best corresponds your level.

- **Mental Demand**

How mentally demanding was the task? e.g. thinking, deciding, remembering, looking, searching, etc.

Very Low	Low	Rather Low	Neither Low nor High	Rather High	High	Very High

- **Physical Demand**

How physically demanding was the task? e.g. pushing, pulling, turning, controlling, activating, etc.

Very Low	Low	Rather Low	Neither Low nor High	Rather High	High	Very High

- **Temporal Demand**

How much time pressure did you feel due to the rate or pace at which the tasks or task elements occurred?

Very Low	Low	Rather Low	Neither Low nor High	Rather High	High	Very High

- **Performance**

How satisfied were you with your performance in accomplishing what you were asked to do?

Very Low	Low	Rather Low	Neither Low nor High	Rather High	High	Very High

- **Effort**

How hard did you have to work to accomplish your level of performance?

Very Low	Low	Rather Low	Neither Low nor High	Rather High	High	Very High

- **Frustration**

How hard did you have to work to accomplish your level of performance?

Very Low	Low	Rather Low	Neither Low nor High	Rather High	High	Very High

Appendix L

Rating Scale Definitions

MENTAL DEMAND

How much mental and perceptual activity was required (e.g. thinking, deciding, calculating, remembering, looking, searching, etc)? Was the task easy or demanding, simple or complex, exacting or forgiving?

PHYSICAL DEMAND

How much physical activity was required (e.g. pushing, pulling, turning, controlling, activating, etc.)? Was the task easy or demanding, slow or quick, relaxed or exhausting, restful or difficult?

TEMPORAL DEMAND

How much time pressure did you feel due to the rate or pace at which the tasks or task elements occurred? Was the pace slow and easy or rapid and difficult?

PERFORMANCE

How successful do you think you were in accomplishing the goals of the task set by the experimenter? How satisfied were you with your performance in accomplishing these goals?

EFFORT

How hard did you have to work (mentally and physically) to accomplish your level of performance?

FRUSTRATION LEVEL

How insecure, discouraged, irritated, stressed and annoyed versus secure, gratified, content, relaxed and complacent did you feel during the task?

(Hart, 1986)

Appendix M

Pilot Testing the Likert Scale Questionnaire

Dear expert,

My name is HOUICHI Asma. I am a PhD student at the University of Abd El Hamid Ibn Badis, Mostaganem, Algeria. I am conducting a doctoral thesis in partial fulfillment of the requirements for the degree of Doctorate in Language Sciences. Pilot testing data collection instruments is an indispensable manoeuvre for it aids to capture potential problems, reveal unforeseen challenges, and prevent them from escalating. Your genuine considerateness is appreciated to facilitate determine if any adjustments and\or adaptations to the instrument are prerequisite.

Research title

Investigating the Effects of Video-Based Learning on EFL Students' Cognitive Load

Case of Firs Year LMD Students in the Department of English Language at Si El-Haoues, Barika University Center

About the instrument

The under-mentioned scale is intended to unveil EFL students' perceptions towards video-based learning presentations and its effects on their cognitive load. The scale was self-designed on the basis of the research objectives and research questions. The items included in the questionnaire were mostly based and inspired from the insights that the review of literature offered to fit into the purposes of the current study. The scale is grouped into three sections encompassing 34 statements in a -point Likert-type scale fashion (from strongly disagree to strongly agree).

Section 1: **Students' Perceptions of Watching Educational Videos**

1. Educational videos are interesting.
2. Educational videos are engaged.
3. Educational videos are clear and understandable.
4. Educational videos are concise and precise.
5. Educational videos provide pertinent content.
6. Educational videos help me to understand concepts.
7. Educational videos are functional.
8. Watching educational videos facilitates the learning process.
9. Watching educational videos helps me to improve my vocabulary knowledge.
10. Watching educational videos improves my learning capabilities.

11. Watching educational videos enhances my learning productivity.
12. Watching educational videos increases my learning performance.
13. I intend to watch similar types of videos in the future.

Section 2: **Students' Perceptions of Educational Videos Compared to Lecturing**

14. I enjoy watching educational videos more than lecturing.
15. I prefer the lectures to be proceeded via watching educational videos.
16. I can learn English easier through watching videos more than through lecturing.
17. I was able to understand more from educational videos than from traditional lecturing.
18. I have learned better through educational videos than through lecturing.
19. Educational videos were a faster way to cover the lecture's material than in lecturing.
20. Educational videos were more effective to cover lecture's material than in lecturing.
21. I find educational videos more demanding than lecturing.
22. Educational videos were more motivating than the traditional methods of teaching.

Section 3: **Students' Perceptions of their Cognitive Load when Watching Educational Videos**

23. Many things needed to be kept in mind simultaneously.
24. The task was beyond my competences.
25. The learning material was challenging.
26. I made an effort to understand the overall context.
27. I made an effort to understand several details.
28. The task helped me memorize more the content.
29. I am not interested in this learning material.
30. I could acquire new vocabularies easily.
31. It was exhausting to find important information.
32. It was difficult to recognize and link crucial information.
33. The workload for watching educational videos was appropriate.
34. The videos were difficult to understand due to the pronunciation.

Appendix N

Students Questionnaire

Dear students

This questionnaire is designed to gather information needed for the accomplishment of a research study. We would be very grateful if you could answer the following questions about your perceptions of watching English educational videos. Your input is very important, greatly appreciated and strictly confidential.

Please answer the questions as honestly as possible and to the best of your ability.

Thanks for your time!

Background Information

Please tick (√) the corresponding answer.

1. **What is your gender?**

Female ☐ Male ☐

2. **How many years have you been learning English in the university?**

1 – 2 years ☐ 2 - 3 years ☐ 3 – more years ☐

3. **Do you watch videos? (English Videos)**

Yes ☐ No ☐

4. **If yes; what kind of videos do you usually watch?**

Educational ☐ Entertainment ☐ Sport ☐ Other ☐

5. **Did your teachers use to teach you through videos?**

Yes ☐ No ☐

6. **Do you enjoy learning English through watching English videos?**

Yes ☐ No ☐

Section One: Students' Perceptions of Watching Educational Videos.

Please indicate on a scale of 1 to 5 your level of agreement with the following statements by putting a tick (√) in the box at the appropriate spot: 'Strongly Agree', 'Agree', 'Uncertain', 'Disagree' or 'Strongly Disagree'.

	Strongly Disagree	*Disagree*	*Uncertain*	*Agree*	*Strongly Agree*
1. Educational videos are interesting.					
2. Educational videos are engaged.					
3. Educational videos are clear and understandable.					
4. Educational videos are concise and precise.					
5. Educational videos provide relevant content.					
6. Educational videos help me to understand concepts.					
7. Educational videos are useful.					
8. Watching educational videos facilitates the learning process.					
9. Watching educational videos helps me to improve my vocabulary knowledge.					
10. Watching educational videos improves my learning capabilities.					
11. Watching educational videos enhances my learning productivity.					
12. Watching educational videos increases my learning performance.					
13. I intend to watch similar types of videos in the future.					

Section Two: Students' Perceptions of Educational Videos Compared to Lecturing.

Please indicate on a scale of 1 to 5 your level of agreement with the following statements by putting a tick (√) in the box at the appropriate spot: 'Strongly Agree', 'Agree', 'Uncertain', 'Disagree' or 'Strongly Disagree'.

	Strongly Disagree	*Disagree*	*Uncertain*	*Agree*	*Strongly Agree*
1. I enjoy watching educational videos more than lecturing.					
2. I prefer that lectures would be proceeded via watching educational videos.					
3. I can learn English easier through watching videos more than through lecturing.					
4. I was able to understand more from educational videos than from traditional lecturing.					
5. I have learned better through educational videos than through lecturing.					
6. Educational videos were a faster way to cover					

the lecture's material than in lecturing.					
7. Educational videos were more effective to cover lecture's material than in lecturing.					
8. I find educational videos more challenging than lecturing.					

Section Three: Students' Perceptions of their Cognitive Load when Watching Educational Videos.

Please indicate on a scale of 1 to 5 your level of agreement with the following statements by putting a tick (√) in the box at the appropriate spot: 'Strongly Agree', 'Agree', 'Uncertain', 'Disagree' or 'Strongly Disagree'.

- **When viewing educational videos:**

	Strongly Disagree	*Disagree*	*Uncertain*	*Agree*	*Strongly Agree*
1. Many things needed to be kept in mind simultaneously.					
2. The task was beyond my competences.					
3. The learning material was challenging.					
4. I made an effort to understand the overall context.					
5. I made an effort to understand several details.					
6. The task helped me memorize more the content.					
7. I am not interested in this learning material.					
8. It was exhausting to find important information.					
9. It was difficult to recognize and link crucial information.					
10. The workload for watching educational videos was appropriate.					

Please write any additional comment or important points you feel were missed in the questionnaire.

……
……
……

Thank you for your time and participation!

Appendix O

Reflective Journals Checklist

DATE:	**SUBJECT:**
TIME:	**VIDEO LENGTH:**

NOTES FOR WRITING REFLECTIVE JOURNALS

- The video and its relation to the lesson objectives.
- Content of the video (clear, relevant, suitable to students' level, etc).
- Students' engagement.
- Students' understanding.
- Advantages of the video.
- Teacher's and students' interactions.
- Teacher's and students' attitudes.
- Teacher's and student's satisfaction.
- Occurring Problems.

Any additional notes:

_____

_____

_____

Résumé

La technologie a réussi à toucher tous les aspects de la vie, y compris le domaine de l'enseignement/ apprentissage des langues. Nous citons là, à titre d'exemple, son apport dans la mise au point de nombreuses méthodes et techniques notamment dans le domaine des langues étrangères. Ces nouvelles stratégies peuvent également être exploitées pour un enseignement/ apprentissage efficient des langues en atténuant les difficultés rencontrées par les étudiants lors de l'acquisition de nouveaux savoirs. L'objectif de la présente étude est-il d'étudier les effets de l'intégration de l'apprentissage basé sur la vidéo en tant qu'outil didactique pour atténuer cette charge cognitive déployée par les étudiants de première année du département des langues étrangères du centre universitaire Si El-Houasse de Barika. Pour mener cette étude, nous nous sommes appuyées sur une esquisse semi-expérimentale et une approche mixte puisque l'échantillon de recherche comprend 101 étudiants sélectionnés de manière assez équilibrée, soit 50 et 51 participants respectivement pour le groupe expérimental et le groupe témoin. Le groupe expérimental a été enseigné en utilisant l'apprentissage basé sur la vidéo, tandis que le groupe témoin a été enseigné avec la méthode classique; l'apprentissage basé sur le texte. Pour collecter les données requises, comme première étape, nous avons utilisé un post-test pour évaluer les performances académiques des participants, puis un questionnaire d'auto-évaluation (NASA-TLX) pour mesurer la charge cognitive déployée par les participants. En troisième étape, nous avons adressé un questionnaire post-traitement au groupe expérimental pour approfondir leurs perceptions personnelles du traitement. Enfin, des prises de note ont été prises par le chercheur tout au long de l'expérience pour relever tout ce qui a trait à l'expérience, durant une période de cinq semaines avec six sessions expérimentales. Les résultats du post-test ont montré une différence significative entre le niveau de la charge cognitive des étudiants, ainsi que leurs performances académiques. Les membres du groupe expérimental ont jugé le traitement très satisfaisant. Comme il nous a été donné de voir à travers les résultats qu'il existe une relation entre la compréhension du contenu par les apprenants par le biais des vidéos et leur niveau de charge cognitive. Il en ressort ainsi que l'utilisation des vidéos en contexte didactique est bénéfique à plus d'un titre, dans la mesure où ce genre d'outils permet de réduire la charge cognitive des étudiants et d'améliorer ainsi leurs performances académiques. Enfin, nous concluons que la présente étude a mis en relief un certain nombre d'idées touchant l'aspect éducatif, étant donné qu'elle met en lumière certaines questions pour les recherches futures.

Mots-clés : charge cognitive, apprenants EFL, apprentissage basé sur du texte, apprentissage basé sur la vidéo.

ملخص

أثرت التكنولوجيا على جميع جوانب الحياة بما في ذلك طريقة التعلم و التعليم، فعلى سبيل المثال شهدت الكثير من الأساليب عددًا من التغيرات في مجال تعليم و تعلم اللغات الأجنبية، حيث يمكن للمدرسين الاستفادة منها لتعليم اللغة الأجنبية، كما يمكن تسخير هذه الاستراتيجيات لتحسين كفاءة تدريس و تعلم اللغات الأجنبية من خلال تقليل الصعوبات التي تواجه الطالب أثناء تلقيهم المعلومات الجديدة. و لتحقيق هذه الغاية هدف الدراسة الحالية هو تحديد التأثير الذي قد يكلفه دمج التعلم المعتمد على الفيديو، كأداة لتقليل العبء المعرفي لطالب السنة الأولى قسم اللغات الأجنبية مقارنة بالتعلم المعتمد على النص في المركز الجامعي سي الحواس بريكة. و لاجراء هذا البحث ، اعتمدت الدراسة على تصميم شبه تجريبي ومنهج مختلط ، حيث تضمنت عينة البحث (101) طالباً تم اختيارهم بشكل ملائم (50 و 51 مشاركاً لكل المجموعتين التجريبية والضابطة على التوالي) ، تم تدريس المجموعة التجريبية باستخدام التعلم المعتمد على الفيديوهات ، بينما تم تدريس المجموعة الضابطة باستخدام التعلم المعتمد على النص ، ولجمع البيانات المطلوبة ، تم استخدام أربع أدوات : أولا، إجراء اختبار بعدي لقياس الأداء الأكاديمي للمشاركين. ثانيا، استبيان تقدير ذاتي (NASA-TLX) لقياس عبء العمل العقلي للمشاركين الذي مروا به أثناء مشاهدتهم للفيديوهات. ثالثا، استبيان بعدي من أجل الكشف عن وجهات نظر الطالب نحو العلاج، وأخيرا، كتابة مقالات رجعية من قبل الباحث طوال التجربة لتدوين كل ما يتعلق بالتجربة ، لمدة خمسة (5) أسابيع مع ست (6) جلسات تجريبية ، أظهرت نتائج ما بعد فرقا كبيرا بين مستوى العبء المعرفي لدى الطالب بالاضافة الى أدائهم الأكاديمي؛ اضافتاً الى ذلك رأى أعضاء المجموعة التجريبية العلاج على أنه مرض للغاية ، وأشار تفسير النتائج إلى وجود علاقة بين فهم الطالب للمحتوى المقدم عبر مقاطع الفيديو ومستوى العبء المعرفي لديهم. من المرجح أن يستفيد المدرس من مقاطع الفيديو كأداة لتقديم الدروس ، والتي بدورها ستقلل من العبء المعرفي لدى الطالب ؛ وبالتالي تحسين أدائهم الأكاديمي ، و في ضوء هذه النتائج ، تقدم الدراسة الحالية عددًا من المقترحات المؤثرة على الجانب التربوي كونها تسلط الضوء على بعض القضايا ذات الصلة للبحث في المستقبل .

الكلمات المفتاحية : العبء المعرفي، متعلمو اللغة الانجليزية كلغة أجنبية ، التعلم المعتمد على النص، التعلم المعتمد على الفيديو.