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THE IMPACT OF INCORPORATING COMPUTER-BASED INTERACTIVE VIDEOS ON DEVELOPING LEARNERS' COMPREHENSION SKILLS IN SCIENTIFIC TEXTS: THE CASE OF SECOND-YEAR STUDENTS OF TAMAZIGHT, AT THE AKLI MOHAND OULHADJ UNIVERSITY, BOUIRA, ALGERIA.

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Abstract: This study aims to investigate the contribution of computer-based interactive videos to learners' speed and quality of understanding of scientific texts written in the Tamazight language. Using the pretest-post-test design, the paper traces in detail the progress of second-year students' comprehension skills before, during, and after the incorporation of interactive videos through computers, at the Department of Tamazight Language, Akli Mohand Oulhadj University, Bouira, Algeria. Given this, the question what effect does the implementation of interactive videos displayed through computer-based technology have on learners' comprehension of scientific texts in the Tamazight language? is the focus of this inquiry. Our presumption on the major topic of this paper stems from our strong belief that multimedia technologies add visual and auditory information to written texts. Hence, we hypothesise that integrating interactive videos using computer-based technology to teach scientific texts in Tamazight will significantly improve learners' fast access to text comprehension, bottom-up decoding skills, and top-down inferencing abilities. We have opted for the experimental method, using an analytic and quantitative approach. The findings of this inquiry indicate that the computer-based interactive videos technology is a significant contributory technique during reading classes to promote learners' comprehension skills. Its effects emerge typically at the level of the time consumed in comprehension and the macro-skills. We have reached a conclusion that highlights and contends with the cause-effect relationship in the hypothesis above. As a result, we strongly advocate teaching reading comprehension skills of scientific texts using interactive videos via the computer technology to learners of Tamazight.

Keywords: Bottom-up decoding skills; top-down inferencing abilities; computer-based technology; scientific texts; interactive videos; Tamazight language

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1. Introduction

Educational researchers and applied linguists working to solve language-related issues in the real world have found an abundance of assets in the field of teaching and learning. Currently, there is a widespread issue with students' poor reading comprehension abilities, especially when it comes to understanding scientific texts, which are known for their explanatory text structure as well as extensive vocabulary requirements (Otero et al., 2002). The primary challenges in understanding scientific texts are related to generating the inferences that are necessary to comprehend them. Factors including background knowledge, reading skills, and the way science materials are presented all have an impact on how well learners draw conclusions. Science texts are often «low-cohesion» texts, which means that readers must draw a lot of conclusions and bridge conceptual gaps from them. A large number of learners struggle to understand scientific literature because they don't have the background information and reading comprehension skills needed to make inferences (Best et al., 2005).

The learners of Tamazight at Bouira University are no exception. Their inability to fully absorb the ideas and meanings found in scientific literature written in Tamazight has a detrimental effect on how well they manage their understanding in class and on tests. As a research professor, it is our responsibility and objective to support our fellow Tamazight department instructors in their efforts to find corrective measures to remove the comprehension gaps in these struggling readers. According to Idri (2012), teaching is about uncovering a learner's latent skills. In other words, the learner ought to be regarded as a unique person possessing hidden, implicit, indirect, inferable, understood, unspoken, tacit, inherent, intrinsic, innate, natural, and inferential abilities. The argument is that we should or must base our instruction on the learner as a person, as a human who is thought to have certain criteria; he or she is capable of doing, accomplishing, thinking, changing, and being independent.

Hence, we have carried out this inquiry to answer the major problem of how the computer-based interactive videos technology can aid in upgrading Tamazight language learners' comprehension skills in scientific texts. We have been interested in addressing three additional questions during this investigation: 1) Which level (or levels) — comprehension rate, macro-skills, or micro-skills—best illustrates the significance of interactive videos via the computer-based technology? 2) What prerequisites must be met for this technology to function well when reading scientific materials in Tamazight? 3) Are the findings compelling enough to use the computer-based interactive videos technology with the students of Tamazight? The particular significance of this study lies in the fact that it addresses the issue of reading comprehension of scientific texts written in Tamazight, a subject that has never been addressed nationally and internationally before. Moreover, we argue that this study moves the field forward because it introduces ICT tools to promote language competencies in Tamazight, mainly reading comprehension skills.

2. Literature Review

The subject of reading comprehension has been broached several times by many researchers all over the world. More than one century ago, teachers have taught reading comprehension skills following the bottom-up approaches which are "serial models where the reader begins with the printed word, recognises graphic stimuli, decodes them to sound, recognises words and decodes meanings" (Alderson & Bachman, 2000, p.16). Hence, the individual learner relies on his knowledge of language to recognise linguistic elements- letters, words, and sentence structures- for the construction of meaning, known as the reader's micro-skills (bottom-up skills). The meaning of a whole text is the set of the meanings of the words and the sentences that exist in the written material. During the 1930_s, 40_s, and 50_s, new

models have emerged from the keen intellectual insights of E, B Henry (1908/1968), who qualified as the forerunner of serious scientific research in the reading comprehension field. In these models, the focus has been on the meaning of a text rather than on its structure. Yet, the principle is the same, that is, the whole meaning starts from the meaning of the individual word. From the mid to late 1960_s, the flurries of experimentations have focused on reading in second and foreign languages. The tenet for these experimentations is that reading is a skill for learners to acquire (Chun & Plass, 1997). Indeed, all the preceding studies have been concerned with answering the question "What understanding does a learner reach?" or "What does a learner bring after activating his micro-skills?" This means that the research works have approached reading comprehension skills as a product emerging from many sub-skills.

From the 1970_s onward, a psychological model of reading introduced by Goodman (1969, 1982) and Smith (1971, 1979) has been incorporated into the previous approaches. It has been an incentive factor for deep and alternative scrutiny of the nature of reading comprehension. It has denoted a paradigm shift where the researchers have shifted from an emphasis on reading as a product to reading as a process. They have adopted the "Top-down models [which] place primary emphasis on reader interpretation and prior knowledge. They are seen as concept-driven in the sense that the text is "sampled" and predictions are made based on the reader's prior syntactic and semantic knowledge"(Goodman, 1967; in Chan & Plass, 1997, p.61). Rather than the micro-skills, learners' macro-skills are activated through three major types of questions: questions of analysis, interpretation, and inference. Besides, the concept of skills transfer across languages has been brought to the surface (Bernhardt, 1991; Grabe, 1991; Horiba, 1996). Hence, most of the contemporary views on (L_2) reading are shaped by research by cognitive psychologists on (L_1) reading comprehension (Chan & Plass, 1997, p.61). By the mid-1980s, three major approaches have accounted for the nature of reading: the bottom-up (micro-skills), the top-down (macro-skills), and the interactive approach (micro and macro-skills). This latter comprises both bottom-up and top-down models. There is a shred of convincing evidence for the view that a high level of comprehension depends on effective interaction between learners' micro and macro skills (Samuels & Kamil, 1984; Silverstein, 1987; Swaffar et al., 1991; Grabe, 1991). Such facts stand for consistent background to our research work since it is based on the belief that the efficacy of the computer-based technology is in stimulating the interaction between the bottom-up and the top-down skills to brush up learners' abilities in assimilating the ideas presented in the scientific texts in their syllabus.

Currently, a plethora of inquiries, particularly on second and foreign language reading comprehension are abundant. Their objectives extend to explore the impact of affective, social, and cultural backgrounds on language acquirers' comprehension (Bernhardt, 1991; Stipek, 2002; Furrer & Skinner, 2003; Snow & Sweet, 2003; Guthrie et al., 2004; Marinier III & Laird, 2006). With respect to the affective background, Sadoski (1999) explains that human qualities of motivation and feelings "count for more in reading comprehension than has been studied" (§47). Hence, highly motivated learners exhibit more comprehension skills than less motivated learners. In this vein, a set of experiments have been conducted on the effect of implementing ICTs on learners' motivation during reading comprehension sessions. The findings indicate that the use of ICT devices in the classroom can improve and expedite the acquisition of languages by increasing learners' motivation, engagement, and awareness of the language (Harper & Milman, 2016; Hashim et al., 2018; Md Yunus et al., 2021; Wong & Md Yunus, 2021).This is perceptibly seen with our experimental participants who graduated with good scores in reading comprehension questions and who tend to be much more emotionally motivated compared to others . Social variables also play a critical role in the reading process. Bernhardt (1991) asserts that the social view of reading is "routed in the belief that texts are

manifestations of cultures… [and that] the processing of texts can be viewed only within a unique context" (pp. 9-10). He adds that since each cultural context will bring a different set of values into play, each cultural context will provide a different reading. These socio-cultural facets are more exhibited in literary texts rather than in scientific texts. Therefore, knowledge of the social/cultural values of the society from which the author comes is not indispensable for the comprehension of scientific text.

Other investigations are attempts to supply remedial solutions to reading comprehension deficits and to develop learners' achievements with much emphasis on the interactive approach (Chun & Plass, 1997; Alderson & Bachman (eds.), 2000; Brown & Fishco (6th.ed), 2002; Ellis, 2002; Adler, 2004, Idri, 2016). Furthermore, the widespread of technology materials has encouraged ample studies on the implementation of technology in reading instruction. Sounds, texts, pictures, and animated videos are powerful supplemental means that technology provides teachers with to reinforce the quality of their input during reading comprehension sessions, thus, learners' feedback (Cohen, 1987; Hamley, Herron, & Cole, 1995; Oller, 1996; Demand Media, 1999). Of special interest is computer technology which creates virtual texts and increases learners' motivation and engagement in the reading comprehension process. It prompts learners to use higher-level thinking skills, and it transforms the instruction from teacher-centred to learner-centred (Schoenherr, 2012). Peek (1993) adds that poor readers may be unable to build mental representations based on the text itself, but with the help of visual aids they may build the appropriate representations. Bruce (1990), Makhoul and Copti-Mshael (2015) highlight the role of computer-assisted instruction to enhance the teaching of languages.

With respect to Yuldashevna and Tuhtayevich's (2021) standpoint, implementing interactive videos in classrooms offers a healthy, prosperous environment that keeps readers motivated and engaged in the reading tasks. They add that computer-assisted instruction which employs interactive videos molds the process of learning according to every reader's distinctive needs. Therefore, the individual reader will develop into more active learner and build long-term micro and macro comprehension skills. Noordan and Yunus (2022) avow that activities involving digital and interactive ICT devices such as computers, interactive videos, and mobile phones increase learners' concentration and help them comprehend faster, which improves learning. According to Buendia and Holgado (2023), interactive videos are replicated forms of the printed paper-based passages into a digital format, and they encompass additional multimedia effects to sustain learners' reading motivation and reading comprehension of a given text. In addition, they provide the possibility for a visual representation of a written material. Besides, they maintain learners' acquisition of new vocabulary, the assimilation of text content and meaning along with reading fluency. During reading comprehension sessions of scientific texts, presenting the texts and the questions on the computer screen will motivate our students, and introducing videos about each text can be a supportive tool for them to grasp the content.

The vital significance of comprehension rate (or reading rate) notwithstanding, it has received few research inquiries. Rate is basically the number of words read per minute along with the automaticity of reading while maintaining comprehension (Anthony,2018). According to Rasinski (2014), the faster readers are, the better they comprehend. Therefore, reading comprehension sessions should encompass timed readings to boost learners' fast access to text comprehension and maintain a successful process of understanding to take place. In this vein, He (2014) states: "…it should be noted that different purposes require different reading speeds…" (p.16). Reading speed fluctuates according to the nature of the written material and the degree of its complexity which implies that timed readings should be designed according to the nature of the written material under analysis. Further studies show

noteworthy contribution of timed readings via ICT tools to impaired readers' comprehension quality, including children with dyslexia (Shany et al., 2022; Horowitz-Kraus, 2023).

This historical sketch introduces us to a wealth of useful information on reading comprehension. It represents a consistent framework to conduct our experiment which is the concern of the second part of this article.

3. Methodology

3.1. Research Problem

We have shed light on some of the positive effects of the computer-based technology, relying on scholarships conducted by prominent researchers. This section offers an opportunity to test one of the ways through which this technology can contribute to the reading comprehension of scientific texts, with students of Tamazight. Our main focus is on figuring out how learners' comprehension of scientific writings in the Tamazight language is affected by the incorporation of videos exhibited via the computer-based technology.

3. 2 Research Questions

1) - Which level (or levels) — comprehension rate, macro-skills, or micro-skills—best illustrates the significance of interactive videos via the computer-based technology?

2) - What prerequisites must be met for this technology to function well when reading scientific materials in Tamazight?

3) - Are the findings compelling enough to use the computer-based interactive videos technology with the students of Tamazight?

3.3 Hypothesis

- Integrating interactive videos using computer-based technology to teach scientific texts in Tamazight will significantly improve learners' fast access to text comprehension, bottom-up decoding skills, and top-down inferencing abilities.

3.4 Population and Sample

We have chosen the second-year students of Tamazight at Akli Mohand Oulhadj University, wilaya of Bouira, specifically groups 1 and 3 to receive the experimental manipulation. The rationale behind the choice of the population is that the inclusion of scientific texts in Tamazight begins in the second year of a BA degree. A subset of sixty (N=60) learners, thirty (N=30) in each group, comprises both groups. For the sample, we have opted for the case study approach. The candidates have been chosen at random from the whole population of second-year students, using the probability sampling method, particularly the simple random sampling method. Group (1) is the representative of the experimental group while group (3) serves as the placebo group that does not go through any variable changes during the experimentation.

3.5 Method

We have decided on the experimental method to fulfil the project's goals and put the hypothesis to the test. A pretest, tests, and a post-test make up the experiment's three phases. Before introducing the computer-based technology, the pretests are used to diagnose the profile of learners in the reading comprehension of scientific texts. Tests are used to monitor students' progress while they apply the technique. The post-tests are employed to assess how accurate the results of the experimental manipulation are and how effective the implemented technique is with the experimental group.

3.6 Materials

- Thirty (N=30) computers.

-Eight (N=8) scientific texts, with an average of 800 words in each.

-Eight (N=8) distinctive silent videos. Each is a three minute video containing images that explain the content of one of the scientific texts used during the experimental stage.

-Eight (N=8) question taxonomies, including bottom-up and top-down items.

3.7 Data collection and processing protocols

- For the two groups of second-year students (1 & 3), the instructor has designed a diagnostic test. The test consists of a scientific passage followed by taxonomy of questions.

- There is a fifteen (N=15) minute time limit for reading comprehension of the content. The instructor sets the amount of time that each group spends during the time allotted.

- Questions requiring macro-skills are rated out of twenty (/20) whereas questions requiring micro-skills are scored out of ten (/10), for the diagnostic test and all the subsequent tests.

-The experiment has been started by the instructor fifteen (N=15) days later. The identical protocols utilised in the diagnostic test are implemented. The experimental group's text and questions are displayed on their computers, with a video explaining the content of each text provided as support. This procedure has been repeated five (N=5) times by the instructor, with a week elapsing between each trial.

- To verify the validity and credibility of the experimental manipulation outcomes, two (N=2) weeks following the completion of the experimental stage, the two groups have completed a post-test.

- Finally, a comparison between the experimental group's and the control group's outcomes has been made before, during, and after the deployment of the computer-based technology.

- The evaluation standards comprise:

- Comprehension rate: 00→15 minutes (mins)
- Micro-skills (Mic) grades:-grade a: 10/10; -grade b: 05→10/10; -grade c: 00→05/10
- Macro-skills (Mac) grades:-grade A: 20/20; -grade B: 15→20/20; -grade C: 10→15/20; -grade D: 05→10/20; -grade E: 00→05/20.

3.8 No Funding Statement

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

3.9 Ethical Considerations

The standards of research ethics have been fully adhered to in the conduct of this study. The paper contains all of the data created or examined throughout this investigation. The data supporting the findings of the research are freely accessible to the public in the publication at hand, free from any form of limitation or privacy policy.

3.10 Conflict of Interest

There are no known conflicting financial interests or personal relationships with the author that could have influenced the work presented in this paper. There is no conflict of interest disclosed by the author.

3.11 Authorship

The author confirms sole responsibility for the following: Study conception and design, data collection, analysis and interpretation of results, plus manuscript preparation and writing. The author has also reviewed the results and approved the final version of the manuscript.

4. Results

4.1 The Application of the Technique

4.1.1 The diagnostic test

-Date: 04/10/2023

-Time: 10h: 00→11h:30 a.m.

Table 1. *The Applicants' Profiles in the Diagnostic Test*

Text	Diagnostic Text	
Group 1	**Percentage of Learners/ Time Consumed**	
	100% 15 mins	
	Percentage of Learners/ Level of Comprehension	
	Mic	**Mac**
	98% b 02% c	10% C 90% D
Group 3	**Percentage of Learners/ Time Consumed**	
	100% 15 mins	
	Percentage of Learners/ Level of Comprehension	
	Mic	**Mac**
	100% b	10% C 90% D

Every member in group one (100%) has used the whole given time to understand the content as Table 1 illustrates. In the same way, all (100%) of the students in group three have spent fifteen minutes to understand the material. There is a strong similarity between the two groups' understanding levels. When it comes to micro-skills, group one involves the vast majority of individuals (98%) who are graded at level (b), with only a handful (2%) receiving level (c). However, the whole group three (100%) has attained level (b). Moreover, both groups' respondents exhibit the same macro-skill levels, which are (90%D) and (10%C). These findings confirm that there is a substantial deficiency in our sample's ability to comprehend scientific texts. The requirement for a corrective measure is therefore essential.

4.1.2 The tests

- Dates: 18/10/2023- 25/10/2023- 08/11/2023- 15/11/2023- 22/11/2023- 29/11/2023

- Time: 10h: 00→11h:30 a.m.

Table 2. *The Applicants' Profiles during the Experimental Manipulation*

Texts	Text 01		Text 02		Text 03		Text 04		Text 05		Text 06	
Group1	**Percentage of Learners/ Time Consumed**											
	100% 15 mins		100% 14 mins		90% 13 mins 10% 11 mins		85% 12 mins 15% 10 mins		72% 12 mins 28% 10 mins		65% 10 mins 35% 09 mins	
	Percentage of Learners/ Level of Comprehension											
	Mic	**Mac**	**Mic**	**Mac**	**Mic**	**Mac**	**Mic**	**Mac**	**Mic**	**Mac**	**Mic**	**Mac**
	100 %b	14% C 86% D	02%a 98% b	16% C 84% D	03% a 97% b	05% B 15% C 80% D	05% a 95% b	07% B 20% C 73% D	08% a 91% b 01% c	08% B 30% C 62% D	10% a 90% b	10% B 40% C 50% D
Group3	**Percentage of Learners/ Time Consumed**											
	100% 15 mins		100% 15 mins		95% 15 mins 05% 13 mins		80% 15 mins 20% 12 mins		85% 13 mins 15% 10 mins		80% 13 mins 20% 10 mins	
	Percentage of Learners/ Level of Comprehension											
	Mic	**Mac**	**Mic**	**Mac**	**Mic**	**Mac**	**Mic**	**Mac**	**Mic**	**Mac**	**Mic**	**Mac**
	100 %b	11% C 89% D	100 %b	12% C 88% D	01% a 99% b	15% C 85% D	02% a 98% b	25% C 75% D	03% a 97% b	02% B 16% C 82% D	04% a 96% b	02% B 25% C 73% D

Table (2) illustrates how quickly and how effectively the students have understood the subject over the course of six (N=06) sequential scientific readings. During reading comprehension sessions, the experimental group has outperformed the control group in reading scientific texts in Tamazight. It has taken participants in both groups around fifteen

minutes to completely comprehend the concepts presented in the first text. Nonetheless, there is a noticeable increase in understanding quality within the experimental group, especially when it comes to macro-skills. Regarding the questions that require micro-skills, all of the subjects (100%) have attained level (b). Macro-skills questions divide the population into two categories: category C (14%) and category D (86%). When using bottom-up models of thinking, the control group has been rated at grade (b), much as the experimental group. There is a minor improvement in top-down comprehension abilities: (11%) level (C) and (89%) level D.

Every group in text two allots fourteen to fifteen minutes to finish the reading comprehension of the text. A portion of the students (2%) has completed micro-skills questions at level (a) while the remaining (98%) has achieved level (b). Additionally, learners' accomplishments in higher-level thinking are always evolving, with (16%) in C and (84%) in D. However, group (3) has not changed in micro-skills but has made very little progress (1%) in macro-skills. The results for the experimental group are altered in text three. For (90%) of the students, reading comprehension of the scientific text takes just 13 minutes while for the remaining (10%), it takes only 11 minutes. Almost all the candidates (95%) in group three spent 15 minutes in the reading comprehension of the text. Just a tiny minority (05%) has required 13 minutes. As the table shows, group one's results to bottom-up questions distinguish between two types of ranks: (3%) level (a) and (97%) level (b). Furthermore, the participants are distributed into three categories according to their feedback to top-down questions. The largest majority of the group (80%) have got level (D), and the other (20%) are divided between level (C) (15%) and level (B) (5%). While learners' advancement in group (1) is prominent in the three criteria- time, micro-skills, and macro skills- group (3) shows little progress. Development of only (1%) is noticed in group three's micro-skills and of (3%) in their macro-skills. The conspicuous evolution in group one is related to their frequent exposure to computer-assisted interactive video instruction which has played a vital role in increasing learners' motivation, engagement, and reading comprehension proficiency as well.

The experimental group takes less time than the control group for reading comprehension in texts four and five. This decrease may be brought about by students' advancement in their reading comprehension skills, which results in less time needed to reach the text's complete comprehension. The results of the experimental group are ranked in descending order from (85%) with 12 minutes and (15%) with 10 minutes in text four to (72%) with 12 minutes and (28%) with 10 minutes in text five. For the control group, there are (80%) with 15 minutes and (20%) with 12 minutes in text four, and a percentage of (85%) with 13 minutes and (15%) with 10 minutes in text five. The applicants in the group (1) improve progressively in both low and high comprehension skills. In text four, they are classified into two classes according to their micro-skills: (05% a) and (95%b). In text five, there are three classes as follows: a small number (8%) with (a) level, a majority (91%) with grade (b), and only (1%) with (c) which is related to the physical health of the learner. Regarding macro-skills, we distinguish between three ranks in text four, which are: (7% B), (20% C), and (73% D). These results develop in text five where we find (08%B), (30%C), and (62%D). By comparison, the achievements of the group (3), mainly in macro-skills, are less apparent. Bottom-up comprehension skills ascend from (2% a) and (98% b) in text four, to (3% a) and (97% b) in text five. Top-down skills rise from (25% C) and (75% D) in text four to (2% B), (16% C), and (82% D) in text five.

Lastly, text six brings the experiment to an end. The overwhelming majority of the experimental group (65%) have attained a time of 10 minutes to comprehend the text, and (35%) of them have accomplished their reading comprehension in 9 minutes. The upper speed of reading comprehension that (80%) of the learners in the control group have reached is 13

minutes; still, there are others (20%) who have attained 10 minutes. While the minority (10%) in the experimental group has got level (a) in micro-skills, most of the learners (90%) are graded as (b). Top-down processes illustrate an augmentation in levels (B) where there is a percentage of (10%), and (C) with a proportion of (40%). Yet, there is a diminution in level (D) (50%) compared to text five as the learners have developed their grades to (C) and (B). Speaking about the level of comprehension of the control group, there are two subsets of learners in bottom-up skills, which are: (4% a) and (96% b). In macro-skills, there are three sorts of learners: (2%) level (B), (25%) level (C), and (73%) level (D). These results demonstrate a development in the number of learners with level (C) in comparison to text five.

4.1.3 The posttest

-Date: 13/12/2023

-Time: 10h: 00→11h:30 a.m.

Table 3. *The Applicants' Profiles in the post-test*

Text	Post Text	
Group 1	**Percentage of Learners/ Time Consumed**	
	62% 10 mins 38% 09 mins	
	Percentage of Learners/ Level of Comprehension	
	Mic	**Mac**
	10% a 90% b	13% B 42% C 45% D
Group 3	**Percentage of Learners/ Time Consumed**	
	77% 13 mins 02% 12 mins 21% 10 mins	
	Percentage of Learners/ Level of Comprehension	
	Mic	**Mac**
	05% a 95% b	02% B 27% C 71% D

Following the completion of the experiment, a post-test has been administered to the candidates in both groups. The experimental group's maximum speeds vary between 10 to 9

minutes, which matches the speeds in text six of the experimental stage. Yet, there is a variation in the percentage of students in each time consumed. In the first set of applicants, (62%) of them have completed their reading comprehension in 10 minutes while (38%) of them fulfilled the text assimilation in 9 minutes. Group three differs from group one in term of the amount of time spent and the proportion of students in each period. There are (77%) of the participants who have required 13 minutes, (2%) have spent 12 minutes, and (21%) have consumed 10 minutes to comprehend the content.

In terms of micro-skills, we observe consistency between the experimental group's (10% a) and (90% b) findings and their outcomes in text six. However, they continually and substantially enhance their macro-skills, as evidenced by the following: (13%) have grade (B), (42%) have grade (C), and (45%) have grade (D). Yet, group three's feedback shows minimal progress in both macro and micro skills. The majority (95%) of respondents have been assessed as (b); whereas, just (5%) have been graded as (a). Three different classes stand out when it comes to top-down comprehension questions: (2% B), (27% C), and (71% D). post-test results show that the computer-based interactive videos technology effectively supports poor readers in understanding scientific texts in Tamazight, sustaining the experimental phase outcomes.

5. Discussion

The impact of videos using the computer-based technology on the improvement of learners' reading comprehension abilities in scientific literature written in Tamazight language has been the subject of an intricate investigation procedure. The process we have proceeded through has been launched with a diagnostic test, then an experimental manipulation, and finally a post-test.

To put things in perspective, the diagnostic test has given us a helpful framework of the candidates' profiles for understanding 800-word scientific passages. The test findings show that the two groups' reading comprehension skills are similar. The main areas where learners' comprehension skills fall short are in their quick, active familiarity and interaction with the textual content as well as their macro-skills. But neither group has found micro-skills to be a significant issue. This may be because micro-information queries demand that the information in the text be used directly and superficially. These results point to a diagnostic symptom: learners' poor comprehension of scientific texts. This suggests that to help students overcome their deficiencies and go past their primary stages, a course of action is required. The earlier results have motivated us to investigate the efficacy of using the computer-based technology for incorporating scientific texts and interactive videos as instructional tools in reading comprehension classes.

The experimental group has since been introduced to our technique. Signs of change have been introduced by the first and second texts in the experimental manipulation. The experimental subset has advanced significantly as compared to the control group, mostly in terms of macro-skills. The control group's regular method of instruction appears to have been less successful based on feedback from students. The learners are given a greater opportunity to understand the texts when they combine texts with videos. Their ability to create relevant syntactic and semantic schemata regarding the text is enhanced.

Further progress from both the experimental and the control groups has been demonstrated by the data gathered from texts three, four, five, and six. The experimental subset performance has been nevertheless more proficient than the control group achievement. Videos provide learners with concrete, visual examples of how language is used for certain purposes and in specific situations, which has gradually but steadily enhanced the experimental group’s skills to analyse, understand, and draw conclusions. This does not

negate the significance of the instructional method used with the control group since they have also improved. Thus, it is important to underline how consistent practice advances the proficiency of any language learner. Seven (N=07) scientific texts have been examined by the candidates in both groups. These texts might have been a supplementary source for the experimental group's advancement, but primarily aided in the growth of the control group.

Finally, a post-test has been completed by the members of the experimental and control groups. In either case, the feedback from learners has proceeded along the same upward trajectory, reinforcing the outcomes of the experiment. From one angle, videos and scientific passages have been shown to correlate well. The use of computer-based technology has proven to be an effective supplementary method in the development of students' reading comprehension abilities both during and following the experimental manipulation. For the individuals of the experimental group, it has been efficacious in improving their cognitive skills related to top-down models of understanding and rapid assimilation of text content. From another angle, the comprehension skills of the control group have evolved somewhat as a result of the standard instructional method using the continuous series of scientific texts. Though this progress is noticeable, it is still very different from what is occurring in computer-based interactive videos reading comprehension classes.

Actually, in whatever study and whatsoever the conditions under which it is conducted and the factors that are controlled, there are further agents that may intervene and affect the interpretation of the findings of the research investigation. These agents come out as a result of some features of either the design or the methodology the researcher has opted for, or both of them. The same principle pertains to our research work. Reading comprehension as an intricate, multi-leveled cognitive process makes the absolute control over learners' cognition and the processes involved in comprehending a text unattainable. While in experiments the sample size varies between 20 to 30 applicants in most cases, in our context this small number might not be deemed representative of groups of university students to whom the results will be generalised. Because of time constraints (only one academic year to complete the experiment) and the determined number of sessions devoted to reading comprehension per week, we have not been able to organise more sessions for the experimental manipulation to allow learners practise on more scientific texts via the computer-based interactive videos technique. This might have influenced the nature of the results obtained, which means that generalisation might become inappropriate to some extent.

6. Pedagogical Implications

The body of this research project is built upon a set of diverse approaches and theories which have been confirmed all through our investigation. To begin with, reading comprehension is a multifarious interactive process in which the interaction occurs between the reader, the text, the teacher, and the learning environment (Flynt & Cooter, 1996). The findings of the experiment show that the four constituents of interaction are complementary during reading comprehension tasks and that each time we have amended one of them, the others have been also influenced by the changes. Next, the holistic approach to reading components which emphasises the processes included in comprehending a given written material rather than the nature and the number of the components has helped us to develop a technique that takes into account both the cognitive (micro and macro-skills) along with the affective (motivation, interest, engagement) components of reading comprehension. Besides, adopting the interactive approach of bottom-up and top-down comprehension levels has aided the applicants to generate more effective comprehension skills and strategies in the long run. Additionally, the taxonomies of questions we have devised are based on the integrative approach to testing which addresses the whole complex of activities and skills of a reader's ability to handle a text instead of assessing one distinct aspect of the reading ability at a time

(Alderson, 2000). This has played a critical role in the candidates' progress and achievements, either in micro or macro-skills.

Furthermore, the variables, the procedures, and the stages we have employed to apply the technique have engendered a set of practical impacts on the teaching method as well as learners' comprehension skills. First, the computer-based instruction along with the interactive videos have created innovation during reading comprehension sessions, which has resulted in raising learners' motivation, interest, and engagement. Second, the regularity in the application of the technique which breeds practice effect has appreciably enhanced learners' comprehension rate and comprehension competencies. Third, practising timed readings via computers during each reading comprehension task has accelerated the applicants' comprehension rate to comprehend the content of scientific texts.

7. Conclusion

The current investigation has aimed at diagnosing the main hazards of comprehending scientific texts written in Tamazight. Afterwards, it has introduced a technique to help the learners preclude their deficiencies and transcend their primary skills. We have used interactive videos on computers with group (1) of second-year students of Tamazight, at Akli Mohand Oulhadj University, wilaya of Bouira. The first section of this research paper has built upon a discussion of some instructional insights into reading comprehension skills along with the different approaches and models to teach them. It has also broached the purposes and the results of various studies conducted in the realm of reading comprehension.

The second section is the most important part as it has helped us to examine the validity of our hypothesis and to check the extent to which our objectives have been attained. We have carried out an experiment employing the computer-based interactive videos technology. This technique inspires its procedures from the interactive approach, and it integrates videos with scientific texts. The comparative synchronic data we have amassed on the experimental and the control groups demonstrate that the implementation of the technique during instructional sessions of reading comprehension is a noteworthy factor in developing learners' understanding of scientific texts. It has successfully fostered our candidates' comprehension skills (reading rate, bottom-up, and top-down comprehension skills), assisted them to surpass their reading comprehension deficiencies in scientific texts, and bridged the gaps in the previous teaching methods. The rate of comprehension and the top-down skills are the two major levels that best illustrate the significance of interactive videos via the computer-based technology.

Furthermore, the computer-based interactive videos technology has created innovation in the teaching of Tamazight and in the learning environment via motivating elements, videlicet: computers, interactive videos, timed readings, question taxonomies on micro and macro skills, together with regularity in the reading tasks. These elements, in their turn, denote the prerequisites that must be met for this technology to function well when reading scientific materials in Tamazight. The findings of the experimental manipulation are compelling enough to use the computer-based interactive videos technology with the students of Tamazight. Hence, the cause-effect relationship in the hypothesis which states that "Integrating interactive videos using computer-based technology to teach scientific texts in Tamazight will significantly improve learners' fast access to text comprehension, bottom-up decoding skills, and top-down inferencing abilities" is confirmed, and the research questions are answered. This leads us to strongly recommend teaching reading comprehension skills of scientific texts using computer-based interactive videos with students of Tamazight.

Lastly, it is crucial to conduct more studies on the scope and nature of the contribution of the computer-based interactive videos technology to different text genres written in

Tamazight, including argumentative, expository, cause-and-effect, and others, in order to further strengthen the outcomes of the current research project. It is also advisable to conduct comparative analyses about the extent to which the technique develops learners' comprehension of different types of texts. Subsequent investigations ought to explore different approaches for using ICT devices to help struggling readers overcome comprehension deficiencies by balancing their degree of comprehension with their rate of access to an inclusive comprehension of texts in Tamazight.

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