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Students' Conceptions to the Use of Tool Mediation for Reading and Vocabulary Instruction: A Case for Modular Object-Oriented Dynamic Learning Environment

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***Abstract*--**As electronic technology and interaction advance because of the quick bursts of digital tools and texts, there is an indubitable necessity for an amalgamation of language learning with authoring tools that appreciably edify English language skills. Accordingly, thisstudy purposes to explore the conceptions of university-level learnersaproposof theuseof cloud computing tools for vocabulary and reading instruction in object-oriented learning environment. The participants of the study were students in two pre-existing classes for the experimental groups. To realize the study, two sets of post-mediation questionnaires, including 31 items for each reading and vocabulary instruction, were distributed to collect data from students.Diaries were also selected for qualitative analysis. The findings showed that the treatment (tool mediation) had a positive impact on university-level EFL learners' vocabulary learning and reading comprehension skills. Finally, educators should use their ingenuity to impart EFL language teachers and students with cloud computing tools in object-oriented schoolrooms and to design a chair-based learning technique, procedure, strategy, and policy technologically.

Index Terms*--Conception*· Glossing· Tool· *Mediation* · *Moodle*

I Introduction

In the age of technological humanities, the crucial to the global rivalry is the contribution of language teaching to high-quality human resources on account of advancements in science and technology. The present emergence and rapidly evolving step-up of technologies have greatly impacted the change in teaching reading or methods of instruction inEFL context (Lin, Chen, Su, & Lai, 2017). In this thriving world of instructional technology and the increasing number of software apps and materials (Teng & Wang, 2021; Rashid & Asghar, 2016), educators and pupils are required to improve their computer literacy and utilize technology for learning and instruction to read (Ismail, Hamed, & Abdu, 2012).They are necessitatedto understand how these tools enhance their educational experience. Despite recent augments in learning through educational technology study, it remains to trail behind changes on the ground (Alavi& Leidner, 2001; Akram, Abdelrady, Al-Adwan, & Ramzan, 2022). During the COVID-19 epidemic, however, there was splendid potential to apply technologies to extend open instructional tools and procedures (Mengistie, 2020; Bozkurt & Sharma, 2020).

According to Lucas and Vicente (2022), for example, the epidemic that has spread all over the globe has resulted in an educational and instructional change marked by an epidemic of emergency digitalization. Before the

epidemic, literati suggested and stressed the need to change methods of instruction to include digital learning concepts (Huang, 2019). However, some vacillated about adapting their methods of instruction to the situation (Kerres, 2020). Consequently, during the outbreak, most educators overwhelmingly simulated their methods of teaching in colleges and universities using technological tools (Kerres& Bucher, 2022; Divjak, RientiesIniesto, Vondra, & Zizak, 2022).

In an era where the internet is connecting everything, education confronts multifaceted opportunities and challenges. For instance, English language learning and teaching breach the edge of the classroom by extending educational activities without time constraints through technological models or cloud computing, which is emerging and impacting the teaching-learning process (Constantinou, 2018; Cheng, 2020). To apply the potential benefits of this, instructors ought to broaden the conventional classroom, backed by cloud computing and big data for instruction (Liu, 2021).

Additionally, an advanced expert who works in a new technical advancement setting is likely to have intricacy learning effectually, like a child with adisorder who has a problem learning somewhat fast (Feuerstein, 2000). Feuerstein continues to say that individuals like this can be similar to a normal child but culturally disadvantaged child (i.e., in this study context, the technological milieu) who has a mediational lack and acquires learning little by littledefectively. This kind of condition may also occur in a university student (Latva, 2001). This essentialsightis built on Feuerstein's (1990, 1991) and Vygotsky's (1978) mediation theories, which are balancing to each other. Particularly, the theories ofstructural cognitive modifiability and mediated learning experience propound a wide-ranging theoretic backdrop to look at the two main scholars' theoretic principles (mediated learning perspectives) for investigating mediation tools to explore students' conceptions on cloud computing tools during reading and vocabulary lessons.

Students' perceptions and attitudes towards technology-mediated learning can affect the implementation of learning.Thomas, De Bellis, Graham, and LaBar (2007) argue that people respond to conditions based on their internal feelings and desires. Nevertheless, Schunk (2012) contends that psychological as well as social factors are more crucial than emotions. Hence, how students respond to their learning experience can be attributed to a combination of psychological and social factors. Social factors may contain the perceptions and aspirations of humans. Furthermore, either the favorable or detrimental attitudes of others in the class may influence students' attitudes toward learning. Psychological considerations might encompass students' willingness and self-esteem to learn better. Because technological applications have been regarded as tools that improve proficiency in schooling, the mindsets of pupils regarding computer-mediated language lessons in or out of the classroom are essential for achievement throughout the process of learning. It is feasible, for example, that if learners have favorable emotions about the utilization of electronic devices in the language classroom, they have a tendency to be more inclined to learn the language and assume accountability for their own language learning.

What is more, considering that mediation is a tool for learners' affective and cognitive development (Abiy, 2005), examining their experience of contentment (Bursali& Yilmaz, 2019) or perception with mediational tools within web-based educational settings remains an important aspect of the present investigation. To put this into action, instructors may have significant personal experience with electronic resources, but they rarely utilize them when they are in the classroom (Burnett, 2011; Chik, 2011). Because the views of learners and educators have an important impact on implementing technologically mediated instruction (Tsai, 2004; Melinis, 2011), there ought to be enhancements implemented in higher educational institutions concerning the accessibility and utilization of technology-mediated lessons and the preparation of teachers (Parker, 1996). Virtual instruction is also a vital innovation that needs to be plainly visible in higher educational institutions (Alabdulakareem& Jamjoom, 2020).

Despite this, it is hardly enough to use technological tools as the sole mode of instruction at Bahir Dar University (BDU), especially for the instruction of language skills.In passing, the researchers strongly argue that it is necessary to carry out reading intervention studies to examine the effectiveness of cloud computing and their particular features in the context of university-level EFL language learners and whether or not these tools

have an effect on students' language skills. Thenceforth, the researchers conducted an experiment for 25 hours (about 12 weeks) to overlook an effective technological aspect of mediation in BDU EFL learners' context. Hence, this study was a part of PhD paper.For the purpose of the present research, the teacher provided the students of the experimental groups with adequate access to the Modular Object-Oriented Dynamic Learning Environment (Moodle) as a cloud-based tool inside and outside the classroom.

Accordingly, with all the above insights, the researchers found it very alluring to investigate the subsequent research questions:

1. *What is the students' conception to the use of cloud computing tools for reading instruction?*
2. *What is the students' conception to the use of cloud computing tools for vocabulary instruction?*

II Methodology

The explanatory research design was used to investigate the conceptions of university-level EFL learners concerning cloud computing tools for vocabulary and reading learning instruction. The study was carried out at BDU in 2023 G.C. ForEG classes, the teacher first made an attempt to arouse the interest of the students on Moodle tools and to activate the students' relevant schema of the text's cognate Communicative English Language Skills II course modules. Consequently, all EG students ran through the exercises online when the cognate exercises or instructions were given to the control group in the paper version. The experimentation was conducted for 25 hours (about 12 weeks) when they studied the reading and vocabulary tasks. For this study, two pre-existing sections were selected. The two intact classes were arbitrarily taken as Experimental Group A (tool mediation with glossing, n = 32) and Experimental Group B (tool mediation without glossing, n = 32). The students did the given reading and vocabulary tasks that were posted on the Moodle site during each week of the study of the treatment.

A post-mediation questionnaire was used for experimental groups (EGs) to find out more information about their experiences, reflections, and conceptions in accordance with Moodle tools after the allotted sessions of the treatment or the immediate post-tests. The quantitative data collected from questionnaires were analyzed through mean, standard deviation, and one-sample t-test using Stata 17.Both post-mediation questionnaires were devised on a five-point scale. Professionals evaluated the questionnaires before dissemination. For all sections of the questionnaires' items, the internal consistency reliability coefficient was also computed. Furthermore, the diary method was employed for corroboration.

III Results

The students' responses to the post-mediation questionnaires were analysed to explore the learners' mediated learning experiences with the cloud computing tools. Table 1 and Table 3 present the mean scores of the treated groups' responses on Moodle tools as a treatment for reading and vocabulary skills, respectively.

Table 1 Summary Statistics: Mean Score of Students' Response to Mediation Tools (Moodle Tools as a Treatment for Reading Skills)

Item	Questionnaire Item	Responses in	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	Mean score	SD
1	I find Moodle useful in my reading ability.	Freq	59	7	1			4.87	.385
		%	88.06	10.45	1.49				
2	The Moodle was an easy program to learn reading skills.	Freq	49	18				4.73	.446
		%	73.13	26.87					
3	I felt confident using the Moodle tool	Freq	48	19				4.72	.454

	to find the reading task I need.	%	71.64	28.36					
4	The teacher's explanation of the use of Moodle program for reading tasks was helpful.	Freq	46	21				4.67	.467
		%	68.66	31.34					
5	I could finish reading the comprehension passages in Moodle tool faster than paper-based reading comprehension.	Freq	39	17	11			4.42	.762
		%	58.21	25.37	16.42				
6	The use of Moodle in communicative English language skills made the reading task more interesting.	Freq	44	22	1			4.64	.513
		%	65.67	32.84	1.49				
7*	The use of Moodle tool is unnecessary in reading skills courses.	Freq	37	22	6	1	1	4.39	.834
		%	55.22	32.84	8.96	1.49	1.49		
8	I can access reading lessons on Moodle at times convenient to me.	Freq	45	19	2	1		4.57	.782
		%	67.16	28.36	2.99	1.49			
9	I can access reading lessons on Moodle when I am not in class or absent from school.	Freq	45	21	1			4.66	.509
		%	67.16	31.34	1.49				
10	Reading lessons on Moodle allow me to work at my own pace to achieve the learning objectives of the reading tasks.	Freq	53	13	1			4.78	.454
		%	79.10	19.40	1.49				
11	In Moodle, I have the option to ask my teacher what I do not understand by sending an email or video chat.	Freq	40	24	3			4.55	.585
		%	59.70	35.82	4.48				
12	I can ask other students what I do not understand during Moodle lessons.	Freq	53	10	4			4.73	.567
		%	79.10	14.93	5.97				
13	The Moodle-based reading activity made it easier for me to comprehend reading passages.	Freq	47	19	1			4.69	.498
		%	70.15	28.36	1.49				
14	I felt more engaged in Moodle-based reading class than in other reading lessons I have taken.	Freq	40	26	1			4.58	.526
		%	59.70	38.81	1.49				
15*	I am not interested in reading activities using Moodle texts.	Freq	37	28	2			4.52	.560
		%	55.22	41.79	2.99				
	Grand mean							4.63	.226

**Reverse coded*

Table 1 voices the students' experiences on the given Moodle-based reading tasks. Noticeably, the response given by students to all items is greater than 4. This is higher than the five-point Likert scale average score.

Interestingly, nearly all students (88.06%) stated that they used the Moodle tool, which helped them while they were doing reading activities. The grand mean score (4.63) indicates that the students who participated in the study strongly agreed with the reading tasks they learned through Moodle. The Cronbach's alpha reliability coefficient for all items was acceptable (.62). However, there is no indication whether this is significantly higher than the expected mean score or not. Therefore, to check statistical significance, a one-sample t-test was computed. The result is presented in Table 2 below.

Table 2 Mean Test for Students' Response to Mediation Tools (Moodle Tools as a Treatment for Reading Skills)

One-sample t test						
Variable	Obs	Mean	Std. err.	Std. dev.	[95% conf.	interval]
ToolRV	67	4.63	.026	.226	4.57	4.69
Mean mean(Mediation_Tools_Reading)					t =	59.12
H0: mean = 3					Degrees of freedom =	66
Ha: mean < 3			Ha: mean != 3		Ha: mean > 3	
Pr(T < t) = 1.0000			Pr(T > t) = 0.0000		Pr(T > t) = 0.0000	

As can be seen in Table 2, there is a significant difference between the participants' response mean score (4.63) and the test value (3) at the stated P<.05 level, t(66) = 59.12, P<.05, d =.226, 95% CI [4.57, 4.69].

Table 3 Summary Statistics: Mean Score of Students' Response to Mediation Tools (Glossing Treatment for Vocabulary Learning)

Item	Questionnaire Item	Responses in	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagre	Mean score	SD
1	The online glosses helped me learn new words.	Freq	26	8	1			4.71	.518
		%	74.29	22.86	2.86				
2	The online glosses were clear and	Freq	23	10	2			4.6	.603
	understandable.	%	65.71	28.57	5.71				
3	Online glosses are better than paper-based dictionaries.	Freq	26	8	1			4.71	.518
		%	74.29	22.86	2.86				
4	Processing different text glossing while reading helps me recall the new words later.	Freq	20	13	2			4.51	.612
		%	57.14	37.14	5.71				
5	Compared to paper-based reading comprehension, the program helped me learn vocabulary better.	Freq	16	12	4			4.43	.698
		%	54.29	34.29	11.43				
6	I can remember many new words in the reading because of the glossing accompanying them.	Freq	21	12	2			4.54	.610
		%	60.00	34.29	5.71				

7	I had the opportunity to explore new vocabulary related to the reading passage.	Freq	18	14	3		4.43	.654
		%	51.43	40.00	8.57			
8	The online glosses helped me understand the passage.	Freq	17	16	2		4.43	.608
		%	48.57	45.71	5.71			
9*	The online glosses distracted or unfocused me from reading the given passage.	Freq	8	20	7		4.03	.663
		%	22.86	57.14	20.00			
10	I would read more reading passages if the reading tasks used online glosses.	Freq	13	19	2	1	4.26	.700
		%	37.14	54.29	5.71	2.86		
11*	At some stages of comprehension, the glosses do not help me to understand the text easier.	Freq	11	17	7		4.11	.718
		%	31.43	48.57	20.00			
12	I use online glosses frequently during the Moodle-based reading task.	Freq	14	17	4		4.28	.667
		%	40.00	48.57	11.43			
13	I feel more confident completing reading activities when the text is accompanied by related glossing.	Freq	14	19	2		4.34	.591
		%	40.00	54.29	5.71			
14*	Reading a passage in English on the web is difficult to read selectively because of too many links and nodes.	Freq	8	17	10		3.94	.725
		%	22.86	48.57	28.57			
15	I make faster progress in English reading comprehension when I read texts accompanied by glossing.	Freq	17	17	1		4.45	.560
		%	48.57	48.57	2.86			
16	Processing different text glosses while reading helps me recall the content of a passage later.	Freq	16	16	3		4.37	.645
		%	45.71	45.71	8.57			
Grand mean							4.38	.057

**Reverse coded*

Students were asked about the benefits of using mediation tools (glossing tools as treatment) for their vocabulary learning and reading comprehension skills. Regarding the above items, it is quite revealing to see from Table 3 above that the great majority of the respondents agree since the computable mean is above 4. The grand mean score of the items (4.38) shows that the comparative inclination of students' responses is toward agreeing. For all 32 items in Table 4, the Cronbach alpha reliability coefficient was 0.83.

Table 4 Mean Test for Students' Response to Mediation Tools (Glossing as a treatment for Vocabulary Learning)

One-sample t-test

Variable	Obs	Mean	Std. err.	Std. dev.	[95% conf.	interval]
ToolPe~n	35	4.38	.057	.338	4.26	4.50

mean = mean (Mediation_Tools_Vocabs) t = 24.19

H0: mean = 3		Degrees of freedom = 34
Ha: mean < 3	Ha: mean! = 3	Ha: mean > 3
Pr(T < t) = 1.0000	Pr(T > t) = 0.0000	Pr(T > t) = 0.0000

As shown in Table 4, there is a difference of statistical significance between the expected mean (3) and the students' observed average score (4.38) at the specified P<.05 level, t(34) = 24.19, P<.05, d =.338, 95% CI [4.26, 4.50].

IV Discussions

Since students' reactions to an application of Moodle tools can greatly impact their learning experience (Chung & Ackerman, 2015), the tool mediation students' responses were analysed as well. The students' responses (as it is made plain in terms of Moodle tools as a treatment for prolonged and repeated practices of reading comprehension and vocabulary learning skills) to the implementation of tool mediation for both skills were received auspiciously. In light of this, the following excerpts of students' reflections in their diaries also substantiated the effectiveness of tool mediation (Moodle tools) for reading comprehension and vocabulary learning skills.

Student Diary (SD14): (…) these reading tasks are very good for improving our language skills. In my opinion, this method of teaching is the leading method. (…) it gives us a chance to practice more, to increase our performance, and to enhance the habit of practicing things like these tasks in the future.

SD2: (…) this plat form is very good for us students in terms of time and convenience; this plat form made me practice reading vocabulary and references.

SD30: (…) To finalize, I had a great experience and learned lifelong lessons regarding how to answer reading questions.

SD32: I will recommend that this learning system be implemented for the next students because it is easier to learn and increases students' communication with technology. It is the best experience for an online learning system.

SD13: Today, I was so happy because I scored a good grade on an online exam. I have significantly improved in my reading and learning; I have noticed this improvement several times as I worked (…).

SD3: (…) the online teaching helps me learn how to read the passage and a lot of vocabulary meanings.

SD31: (…) I know the meaning of words that I did not know before, and help me improve my English skills (…) Overall, the passage helped me improve my vocabulary and reference skills.

SD22: Today was my second day to attend an online class. I get some vocabulary words collected from the reading passage with their meanings. I tried to memorize(...)

SD9: I was practicing new words and increasing my vocabulary knowledge related to the passage (…) it is very important to me because it will not be forgotten when I practice and train myself daily.

SD38: My dear diary, what I learned from this experience and what I want to tell you is that I believe I am not proficient at English. This [The treatment] helped me a lot to understand that and gave me a good experience. Even if it was difficult, it was enjoyable. I also improved my reading and vocabulary skills through this program.

All in all, students feel that cloud computing tool (Moodle) is useful in an overall way (perceived usefulness). This result is aligned with several studies (Chung & Ackerman, 2015; Truong, 2021; Gudkova, Reznikova, Samoletova, &Sytnikova, 2021).

V Conclusions

The responses made by the experimental group students to the questionnaires (students' reactions to Moodle tools as treatment) in general showed that the treatment (tool mediation) had a positive impact on university-level EFL learners' vocabulary learning and reading comprehensionskills. Thus, based on these findings, it can be concluded that the treatment (tool mediation) had the most likely effect on students' reading and vocabulary learning skills. Along with this, the impact of L1 and L2 glosses and their roles in reading comprehension and vocabulary learning achievement could be studied.

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