

Research Article

TOWARDS DIGITAL-BASED INSTRUCTION IN EFL/ESL CONTEXTS

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ABSTRACT

The pedagogical application of digital-based instruction has caught specialists' consideration in the realm of education. Recently, studies and organizations have focused on the application of digital-based technologies in learning. Additionally, video games provided a context for interaction, discussion and understanding of the concepts. The aim of this investigation is to review the current literature on digital-based studies, to reflect the perspectives of previous researchers, and to examine the results of some of previous studies. The review of some studies showed that over past two decades' research on digital-based instruction in foreign and second language has expanded the notion of Computer Assisted Language Learning and Mobile Assisted Language Learning in teaching English language. Additionally, certain recommendations are suggested to ameliorate the process of digital-based instruction in educational context. Consequently, the current investigation is useful for language practitioners, university students and educational administrators.

Keywords: Computer Assisted Language Learning, Digital-based Instruction, EFL/ESL Educational Context.

INTRODUCTION

Computer technology is designed to promote student attainment and instructor quality in educational plans at all stages. Computers initially applied as resources for education in 1950 when appropriate programs were expanded. Recently, development has been fast and technology has been regarded as a means of instruction. The dominant one is the utilizations of computers in academic context during past years which is called computer assisted instruction (McKethan, Everhart, & Sanders, 2001). Digital games are amusing choices with lots of players applying dominant languages. Hence, "Ubiquity, diversity and accessibility" are documented as identifiers for digital-based games (Reinhardt & Sykes, 2012, p.32). In 1960s, Computer Assisted Language Learning (CALL) was presented as a student-centered platform to assist learning (Stockwell, 2012). Additionally, CALL was documented as a beneficial realia for cognition and memory in educational context. With the speedy growth of modern technology, and application of that in education, many researchers popped up to examine more stimulating learning options in academic context (Golonka, Bowles, Frank, Richardson, & Freynik, 2012). Many investigations designated that computer games are beneficial for language use, owing to its pleasing characteristic. In this regard, Lepper and Malone (1987) highlight that consistency of game activity with the learning activity in the supportive context develops learning. On the other hand, discrepancy of game activity and the learning activity would not develop learning. According to Lepper and Malone (1987), higher relationship of games with the educational subjects lead to the better knowledge gain. Thus, selection of games with educational purposes should be considered as teacher's accountability. Computer technology has been examined in many studies (e.g., Chang & Lehman, 2002; Guthrie & Richardson, 1995). Additionally, the application of mobile technology is spreading all over the world. In this regard, Joiner, Stanton and Luckin (2003) claim that learning through technology and mobile should be presented in education to deliver interactive learning context, which leads to technological basis aimed at MALL and CALL.

The advantage of the mobile learning was observed and studied in several educational contexts. Besides, Chinnery (2006) highlighted the advantages of the tablets and smart phones and their instructive importance in teaching and learning process. Like CALL, m-learning has presented in the development of foreign language education and it has practiced over past years. Researchers have been verified that mobile learning technologies could be applied in teaching vocabulary (Chen & Li, 2010; Kim & Kim, 2012), facilitates teaching grammar, improves students' reading skills (Hsu, Hwang & Chang, 2013) and enhances students' writing proficiency (Ivić & Jakopc, 2016). Other investigations revealed that mobile learning provide students the opportunity to record and listen their voice which could improve learners' pronunciation and communicative ability (Hwang, Huang, Shadiev, Wu, & Chen, 2014). Additionally, mobile learning offers collaborative setting which improves students speaking ability (Hwang et al., 2014; Hwang, Shih, Ma, Shadiev, & Chen, 2016). Multimedia in educational settings is helpful for supporting learners' learning through storage and presentation process. Therefore, mobile applications for should be integrated in teaching to support teaching content and insure learning. According to Gee (2007) players consider digital games based on three classes, single-player games that permits students to link with the content independently; multi-player games which permits linking players together then massive multiplayer game which enables extensive social communications. This kind of teaching and learning process creates a context, where students cooperate to use their prior knowledge and expertise to solve problems. Further, it provides teachers the chance to achieve their own educational objectives (Angelini, 2016). Through this kind of teaching, the player gains communicative, cooperative and decision-making skills (Flanagan, Nestel & Joseph, 2004). According to Robertson, Schumacher, Gosman, Kanfer, Kelley & DeVita (2009) this kind of teaching can be done independently or within a group and may lead to collaboration and knowledge sharing among students. Recently, digital-based teaching, which engages learners in the communicative and genuine attainment of knowledge, has been used in higher educational setting.

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Theoretical Framework: During past years, some studies have examined the efficiency of digital game-based learning with different

premises (e.g., Bowles, 2004; Jones, 2004; Jones & Plass, 2002), as well, some researchers focused on the theoretical support for the practice of them as a valid tool for Second Language Acquisition (SLA) (e.g., Hulstijn & Laufer, 2001; Schmidt, 1990). The inspiration to do such researches, came from different theoretical backgrounds such as Schmidt's (1990) noticing hypothesis, Mayer's (2005b) cognitive model of multimedia learning, and interactive theory. Besides, this type of teaching highlights the issue of individual differences in language learning. Besides, digital -based education has been applied to intensify learner's retaining, shape group work abilities, and interaction (Bodnar, Anastasio, Enszer, & Burkey, 2016). Besides, game technology offers the choice to evaluate learners' improvement over periods of time owing to the continued engagement with the games. In this realm, Schmidt (1990) claims that attention is crucial in the attainment of a second language. Some studies (e.g., Leow, 1997b; Rosa & O'Neill, 1999) have supported Schmidt's noticing hypothesis and the diverse stages of consciousness. Due to the extensive literature on noticing in language learning according to Schmidt's (1990) noticing hypothesis, supporting or prompting noticing in educational context has been recommended. Much similar to noticing, awareness-raising of the learners about language has been recommended to reflect learner's consideration on language (Schmidt, 1990). Another theoretical foundation of this study is Mayer's (2005b) cognitive theory of multimedia learning. This theory suggests a hypothetical framework for examining multimedia education and the cognitive courses engaged in language learning. Mayer (2005b) highlights that education in multimedia settings is assisted once the material is offered over verbal and visual paths in a way that does not burden the working memory. For example, offering evidence through words and pictures rather than only words or presenting pictures and words concurrently instead of sequentially. Concerning micro level, the arrangement of visual evidence with verbal evidence can closely lead to dual coding of the evidence in the form of a verbal and a nonverbal mental image. On the other hand, on a macro level, visual evidence assists text understanding and roles as complementary evidence supplemented with the mental model of the text. The following figure highlights the role of Schmidt's (1990) noticing hypothesis in learning language.

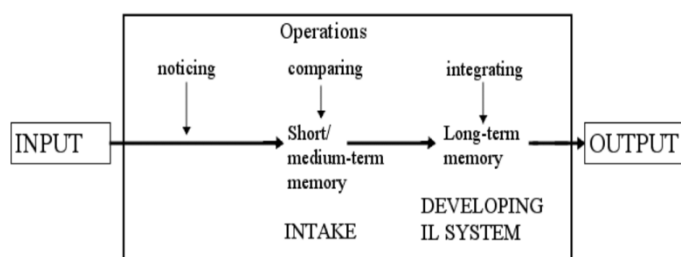


Figure 1. Noticing and language acquisition (Ellis, p.119)

Review of Literature

Some studies investigated digital game-based instruction and learners' attainment of non-traditional students (e.g., Burgess, Stermer, & Burgess, 2012; Young, Slota, Cutter, Jalette, Mullin, Lai & Yukhymenko, 2012). In fact, the National Research Council recommended studies be directed in this realm because only slight confirmation exists to support digital game-based instruction in academic context (Clark, Tanner-Smith, & Killingsworth, 2014). Thus, an extensive understanding of digital-based instruction and its effect on different students' performance concerning different skills or sub-skills are required (Kim & Chang, 2010).

Language learning is considered as a complex task which can occasionally be tiring (Ersoz, 2000). Thus, continuous exertion is needed to comprehend and produce the target language. Appropriate games are helpful as they give students a break and allow them to practice language skills. Games are inspiring since they are entertaining and challenging. Additionally, they apply meaningful and useful language in real contexts and inspire cooperation. According to Ersoz (2000) games are highly motivating because they are entertaining and stimulating and can be experienced in all language skills.

Related Studies in the World

According to Cruz, Cruz, Ruiz and Hernandez (2015), digital based education offered a substitute plan for teaching. Employing digital technology in teaching helped instructors to improve the traditional teaching through presenting video games in educational context. Consequently, this practice draws on students' recall, and develop their consideration during the learning practice (Kirkorian, Wartella & Anderson, 2008). In this regard several studies (e.g., Comillie, Clarebout & Desmet, 2012; Lambert & Gong, 2010; Thirunarayanan & Vilchez, 2012; Yip & Kwan, 2006; Zou, Huang & Xie, 2019) highlighted the dominant role of video games in education as an important alteration in the students' learning processes.

The following table summarizes the evolution of video game studies over the world.

Reasonably, fundamental learning abilities can be strengthened through video games application in academic context. Besides, through spatial visualization abilities video games would foster knowledge transfer. Recently, the new outlook towards education has incorporated playing video games as an indispensable part of the learning context (Hayes & Silberman, 2007). In this regard, Zou, Huang and Xie (2019) mentioned the significance of word knowledge for Second Language Acquisition. The researchers stated that game-based education is evolving the teaching process. The findings of their review revealed that application of digital games in ESL/EFL context could promote short-term and long-term lexis retention, facilitate reading and listening comprehension, raise students' involvement, reduce stress and develop communications among students in class setting.

Related Studies in Iranian EFL Context

Increasing teachers and learners' motivation to apply digital-based instruction in class setting, is supported by a range of studies (e.g., Aslanabadi & Rasouli, 2013; Mokhtarnia, 2007). Further, Sung, Chang and Yang (2015) highlighted incorporating multiple teaching strategies as a crucial factor for learners' better learning attainment. Concerning this issue, several studies (e.g., Ashraf, Ghanei Motlagh & Salami, 2014; Ebrahimzade & Alavi, 2016; Dolati & Mikaili, 2011; Khyabani, Ghonsooly & Ghabanchi, 2014) highlighted the potential effect of video games specially on vocabulary acquisition in Iranian EFL context. The following table summarizes the evolution of video game studies over Iranian EFL context. Based on Ashraf Ghanei Motlagh and Salami (2014) online games can be effective in learning vocabulary. Their study indicated that online games created an inspiring situation for Iranian EFL students where learners subconsciously shared their knowledge during playing. Besides, Rahimi Esfahani, Rafizade Tafti and Hajjilili's (2019) investigation revealed that EFL learners acquire new words better via digital games and through learners' cooperation with each other in a pleasant environment.

Table 1. Evolution of video game studies over the world

Name of researchers	Name of study	Year of study	Main findings
Yip and Kwan	Online vocabulary games as a tool for teaching and Learning English vocabulary.	2006	Learners and instructors regarded online games as effective tools for learning vocabulary.
Turgut and Irgin	Young learners' language learning via computer games.	2009	Video games are effective for acquiring new vocabulary and pronunciation.
Lambert and Gong	21st century paradigms for pre-service teacher technology preparation.	2010	Instructors' perception and self-efficacy associated with technology was positively correlated with both prior exposures and prior application of technology.
Cornillie, Clarebout and Desmet	The role of feedback in foreign language learning through digital role playing games.	2012	Technology facilitates the language learning development.
Thirunarayanan and Vilchez	Life skills developed by those who have played in video game tournaments.	2012	Video games assisted students to be properly involve in educational context.
Nino and Evans	Lessons learned using video games in the constructivist undergraduate engineering classroom.	2014	Video-games could develop students' skills namely, high-order thinking and decision-making ability.
Hanus and Fox	Assessing the effects of gamification in the classroom: a longitudinal study on intrinsic motivation, social comparison, satisfaction, effort, and academic performance.	2015	The findings showed less motivation among university students who have experienced gamified teaching
Cole and Vanderplank	Comparing autonomous and class-based learners in Brazil: Evidence for the present-day advantages of informal, out-of-class learning.	2016	The findings revealed self-determined instrumental motivation as a crucial force for assisting autonomous learners to attain better outcomes in academic setting.
Franciosi	The effects of computer game-based learning on FL vocabulary transferability.	2017	Computer game-based tactics to foreign language teaching in classrooms can develop transferability of vocabulary.
Gangaiamaran and Pasupathi	Review on use of Mobile Apps for language learning.	2017	Listening skills are learned through mobile apps better than other language skills.
Ozer and Kilic	The effect of mobile-assisted language learning environment on EFL students' academic achievement, cognitive load and acceptance of mobile learning tools.	2018	Learning a Foreign Language in mobile assisted learning settings were not cognitively overloaded.
Zou, Huang and Xie	Digital game-based vocabulary learning: Where are we and where are we going?	2019	Digital games had a positive outcome in developing short-term and long-term vocabulary learning, assisting reading and listening comprehension, enhancing motivation and learners' engagement.

Table 2. Evolution of video game studies over Iranian EFL context

Name of researchers	Name of study	Year of study	Main findings
Mokhtarnia	An Investigation of Metacognitive Awareness of Hypertext Reading Strategies of Iranian EFL learners.	2007	The findings revealed statistically significant difference between metacognitive awareness of hypertext and printed text regarding reading skills of Iranian EFL learners.
Barani	The relationship between Computer Assisted Language Learning (CALL) and listening skill of Iranian EFL learners.	2011	CALL had a dominant effect on learners' listening ability.
Dolati and Mikaili	Effects of instructional games on facilitating of student's vocabulary learning	2011	Playing game had a significant effect on development of students' vocabulary learning. Besides, the findings revealed that games could inspire the passive and quiet students.
Saffarian and Gorjian	Effect of computer-based video games for vocabulary acquisition among young children: An experimental study.	2012	The outcome revealed facilitative role of computer games in teaching and learning English language.
Aslanabadi and Rasouli	The effect of games on improvement of Iranian EFL vocabulary knowledge in kindergartens.	2013	Games stimulated students' learning and improved their self-confidence.
Vahdat and Rasti	The effect of video games on Iranian EFL learners' vocabulary learning.	2013	Video games were effective in enhancing learners' knowledge of vocabulary and males were more influenced by learning with video-game.
Khiyabani, Ghonsooly and Ghabanchi	Using multimedia in teaching vocabulary in high school classes.	2014	The practice of multimedia provided the bridge for a better understanding of vocabulary.
Ashraf, Ghanei Motlagh and Salami	The impact of online games on learning English vocabulary by Iranian (Low-intermediate) EFL Learners.	2014	The findings revealed that on line games were more effective in teaching and learning English vocabulary for Iranian EFL learners.
Ebrahimzade and Alavi	Motivating EFL students: E-learning enjoyment as a predictor of vocabulary learning through digital video games.	2016	E-learning satisfaction could assist students keep up through the constant practice of language learning, it could develop students' knowledge of vocabulary.
Rahimi Esfahani, Rafizade Tafti and Hajjalili	The impact of digital games on intermediate EFL learners' vocabulary improvement.	2019	Application of digital games enhanced intermediate EFL learners' vocabulary knowledge.

Implication of the Study to the EFL/ESL Researchers

Several studies have broadly examined the digital-based education in language learning. Some studies showed that proper use of mobile phones and tablets, promotes students' academic attainment (e.g., Huang, Lin & Cheng, 2010; Ivić & Jakopcic, 2016; Lu & Yang, 2018). In a recent meta-analysis Sung, Chang, and Liu (2016) indicated that employing mobile devices in teaching had a significant effect on learners' attainment. In this regard, Hwang et al. (2014) showed that learners had positive view points towards implementing tasks via mobile and learners were interested to practice skills more once applying a mobile device.

Besides, increasing enthusiasm to apply mobile for educational purpose, is reinforced by a series of investigations (e.g., Ciampa, 2013; Huang, Lin, and Cheng, 2010; Zheng, Chen and Kong, 2017). Incorporating mobile devices by means of various teaching/learning tactics is needed for enhanced learning accomplishment (Sung, Chang & Yang, 2015). Digital-based education as one of the most fundamental concepts in learner-centered classes play dominant role in EFL/ESL educational context. Several studies are conducted in this regard in the world (e.g., Cornillie, Clarebout & Desmet, 2012; DeHaan, Reed & Kuwada, 2010; Lambert & Gong, 2010; Ozer & Kilic, 2018; Wu, Chen, &

Huang, 2014; Yip & Kwan ,2006; Yuditseva, 2015) which revealed learners' positive outlook concerning the significance of employing technology in the class setting, enhanced their self-efficacy, words recall and meaningful communication. Additionally, several studies focused on digital-based education in Iranian academic context (e.g., Aghlara & Tamjid ,2011; Aslanabadi & Rasouli,2013; Barani, 2011; Dolati & Mikaili, 2011; Khiyabani, Ghonsooly & Ghabanchi,2014; Mokhtarnia,2007). The outcome of these studies showed that digital-based education in Iranian L2 classes created a learner-centered environment and digital games had assisted learners in successful learning. Besides, games provoked students for learning, enhanced their self-confidence and developed deeper understanding of vocabulary.

The results of the investigations credited to several factors namely the contexts of the study, ESL or EFL, the research methodologies, the extent of the treatments, individual and socio-cultural features of the contributors as well as the age, gender and English expertise of the participants. Therefore, variety of components can affect the outcomes of the digital-based research. Following suggestions are provided for future investigation.

- Further research is needed to focus on incorporating students' feedback and students' interaction during digital-based learning.
- The effect of interactive context in class rooms' social setting and the effect of classroom discourse on students' performance through teacher feedback or peer feedback in digital-based learning context.
- The effect of digital-based learning context on individual learners' interlanguage pragmatics specially for EFL context.
- The consequence of digital-based learning context on willingness to communicate of the learners in anxious-free environment for EFL learners.
- The relationship between metacognitive knowledge awareness of learners in the interactive setting of digital-based learning.

Conclusion

Attention to digital game-based education are distinguished in investigations through several disciplines. Besides, positive outlook and learners' involvement were greater for those who applied digital games (Boeker, Andel, Vach, & Frankenschmidt, 2013). In this regard, the application of digital game-based education led to learners' cognitive development over script-based education (Boeker et al., 2013). According to Reinders and Wattana (2015) digital games provided a safe situation for education through decreasing learners' stress and enhancing their willingness to communicate. In this realm, Rebetz and Betracourt (2007) explain that video games stimulate the cognitive skills of the students. They assist students to develop positive insight as well as increasing aggressive actions. In fact, these features of video games are effective for students' learning. Currently, instructors considered that technology can be used as an essential constituent for supporting education in educational context. In the recent instructive context, there has been collective development of digital-based education in the curriculum. To support this perspective Kirkorian Wartella and Anderson (2008) acknowledges that the attention of children is easily influenced via integral practices in teaching. Thus, digital-based learning engages students in learning which results in higher achievements in learning language. Through the development of net-based education, online games have been available to most students. Students can link to the internet and use special net games to contribute dynamically in communicating context. Computers are part of every body's life, and

internet became significant source of information in today's world. The multimedia capacity seems ordinary for youngsters whereas adults may not be eager to apply computers. In this case, schools can employ them to enhance students' attainment (Sütheö, 2004). Through this kind of training, the players may acquire significant expertise namely communicative, decision-making and task managing skills (Flanagan, Nestel & Joseph, 2004). Thus, teachers can apply digital games-based learning to strengthen their student's retention, develop teamwork and interaction in class setting.

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