ICT and EFL Students' Self-Regulation Mastery: Educational Meat or Poison?

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Abstract

This study used a pretest–posttest control group design to find out if application of ICTs including internet, e-mail, blogs, Skype, and PowerPoint could develop Iranian English students' self-regulated learning. To this end, sixty (N=60) English students within the experimental and control groups took part in the study. While internet, e-mail, blogs, Skype, and PowerPoint were used as the main medium of instruction in the experimental group, in the control group the paper-based traditional method was used. A survey adapted from Lai and Gu (2011) was used to gather the data. The results of the study indicated a significant difference between the control and experimental groups in regard with their self-regulated learning. That is to say, the experimental group taught through ICT tools acquired higher levels of self-regulation as compared with the control group instructed through the traditional teaching method.

Keywords: ICT, self-regulation, EFL

Introduction

Self-Regulated Learning (SRL) has become a crucially prominent concept in education studies in recent years (Ellis & Folley, 2011). According to Zimmerman and Schunk (2001), SLR involves self-generated thoughts, feeling, and actions which are monitored and carried out by students toward attainment of their learning goals. In the same vein, Zimmerman (2001) argued that self-regulation encompasses three phases including forethought, performance, and evaluation that come into play frequently during learning process. In fact, SLR is associated with a good amount of skills and strategies encompassing, inter alia, goal setting, environment structuring, self-monitoring, help seeking, and task strategies (Zimmerman & Schunk, 2001) which allow learners to reflect on their learning and assess their progress and consequently make the most of their learning activity. According to Boekaerts, Pintrich, and Zeidner (2000, p.751), "self-regulation involves cognitive, affective, motivational and behavioral components that provide the individual with the capacity to adjust his or her actions and goals to achieve the desired results in light of changing environmental conditions". These SLR components are developed as a result of the reciprocal interaction of personal, environmental, and behavioral factors (Schunk, 1989; Zimmerman, 1994). It is transparent that the active role of learner is at the heart of this understanding of learning (Fischer & Mandl, 2002).

Teachers can support learners to develop self-regulated learning using different elements of instruction. The literature showed the prominence of providing learning environments that stimulate reflection and revision (Dettori & Giannetti, 2005), offer learners opportunities to monitor the essential dimensions of learning (Rosario, Nuñez Perez, & González-Pienda, 2004), and provide

opportunities to get and give feedback (Karamarsky & Zeichner, 2001). Hence, it is postulated that learning environments in which learners are involved and engaged play a pivotal role in their self-regulated learning. Friedrich and Mandl (1997) maintained that persons, institutions, media in conjunction with methods and teaching practices can be considered as components of learning environments that if employed appropriately can lead to the learners becoming self-regulated.

Within the realm of English language teaching, the shift in focus from learning of grammatical and lexical structures to the use of language to communicate for real purposes together with the explosive growth of Information Communication Technology (ICT) has brought about dramatic changes in teaching techniques and procedures. This trend has provided language learners with opportunities for continuous learning and effective use of language to communicate with people from different parts of the globe (Yuvienco & Huang, 2005). ICT tools are argued to be a learning tool in education in general (Md Yunus, 2007) and a great educational potential for language learning in particular (Thorne, Black, & Sykes, 2009; Zhao & Lai, 2007). According to Andrews (2000), ICT refers to multimedia technologies encompassing computer software, CD-ROM, the internet, mobile phone, television, film, e-mail, chat, blogs, wikis, podcasts, etc.

The role of technology in fostering and nurturing autonomy has been highlighted over the recent years. Watts and Lloyd (2001) found that in technology-embedded learning environments, language learners become self-organized and self-directive resulting in developing self-regulated learning. Healey (2002) held that self-regulated learning fostered and bolstered by means of ICT can considerably benefit language learners in that it can make them aware of their contribution to the teaching-learning process and further persuade them to take an active role in their own learning. Investigating the effects of adopting a technology-enhanced language learning framework on the students' perceptions of their EFL classroom environment, Rahimi, Ebrahimi, and Eskandari (2013) found that a technology-enhanced language learning environment proved to be more efficient, learner-centered and facilitative of learning.

As noted above, learning environments in which learners are engaged, in large measure, influence the extent the learners need to employ self-regulated behaviors. If a learning environment is highly structured and controlled by the teacher, the learners need not be self-regulated in order to be successful in that learning environment. In contrast, the environment which engages the learners in employing helpful self-regulated behaviors such as planning, monitoring, and strategy use on their own is far more likely to develop SLR (Bernacki, Aguilar, & Byrnes, 2011). Given that using and working through technology-embedded learning environment for the purpose of successful language learning requires a host of strategies including, but not limited to, cognitive and metacognitive processes such as task analysis, goal setting, strategic planning, it is reasonable to expect that there will be a linkage between SLR and the learning environments in which ICT tools are incorporated. Based upon such reflections, this study was an attempt to investigate if application of ICTs including internet, e-mail, blogs, Skype, and PowerPoint could develop Iranian English students' self-regulated learning. In this study, the idea of self-regulated learning is a process in which the language learners used the ICTs for goal commitment regulation, metacognitive regulation, resource regulation, cultural learning regulation, social regulation and affection regulation. In other words, the learners used the ICTs as important sources and tools to reach their goal in learning the language more quickly and efficiently; to monitor and plan learning tasks; to seek and get access to a wide range of learning resources; to understand, appreciate, and interact with the target culture better; to connect with peer learners and native speakers of the language all over the world; to make the task of language learning more attractive and free of anxiety.

In effect, this study sought to answer the following question:

> Does incorporation of different forms of ICTs (including internet, e-mail, blogs, Skype, and PowerPoint) develop self-regulated learning of EFL learners?

Method

Participants

Since it fell outside the realm of possibility to randomly select the participants, a total of sixty (n=60) Iranian female learners from two intact English conversation classes within the experimental and control groups were chosen to participate in the study. All the learners were in the age range of 16–21 and were studying English at a language school.

Instrument

A survey adapted from Lai and Gu (2011) was used to gather the data. Lai and Gu drawing on socio-cognitive models of self-regulated learning (Pintrich, 2000, 2004; Zimmerman, 2000) as well as the available literature on contributions of technology to language learning (Ducate & Arnold, 2006; Zhao & Lai, 2007) developed this survey to explore language learners' self-initiated use of technology to regulate the various aspects of their language learning experience. The survey consisted of 28 Likert-items that measure the following six factors: (1) Goal Commitment Regulation, (2) Affective Regulation, (3) Social Connection Regulation, (4) Resource Regulation, (5) Metacognitive Regulation, and (6) Culture Learning Regulation. The participants were asked to indicate the degree to which they agreed with each of the statements using a scale from 1 (strongly disagree) to 5 (strongly agree).

Procedure

The participants took the pretest at the beginning of the semester. The treatment sessions lasted over 10 weeks (two 90- minute sessions per week). The experimental e-learning class was provided with the ICT support method by a trained teacher and the control group with the paper-based traditional method on the same teaching materials. The teaching material used for the both groups was Four Corners (2) authored by Jack C. Richards and David Bohlke (2011).

In the control group, the course was taught with the paper-based traditional method without the involvement of technology. The traditional method of teaching, here, refers to the method that incorporated the following main features: (1) lectures on teaching grammar and other aspects of language by the teacher, (2) listening to tape and repeat after the teacher, (3) nearly all communications are initiated by the teacher in the form of teacher-learner direction, and (4) assignments are marked and returned by the teacher without any further feedback.

As for the experimental e-learning class, the learners were taught with incorporation of the relevant ICT instructional package including internet, e-mail, blogs, Skype, and PowerPoint. The teacher presented the teaching materials through PowerPoint and at times the participants delivered a lecture relevant to their course through PowerPoint. The participants had to submit their written assignments, as attachments, via email to the teacher to be marked and returned. Via email, the teacher sent the participants feedback, assignments, and relevant websites to be visited and reviewed for the next sessions. The participants were invited to discuss their language problems via email and the teacher provided email consultation on such problems. Another ICT tool that was employed in the experimental class was text or audio format chatting. Chat was included as part of the participants'

course in that they had to set up a Skype account and engage in either text or audio chat on topics the teacher emailed them in advance. Chat was in the form of teacher-learners or learners-learners with the teacher playing the role of a moderator. The last ICT tool was a blog, designed by the teacher, where the participants were invited to post news and comments, homework, links, what they are learning, and how they have learnt something. After the treatment session, the posttest was administered to the participants in both classes.

Results and Discussion

An Independent Sample *t*-test was used to determine whether there were significant inter-group differences. The analysis of the self-regulated learning scores (pretest) of the participants in the experimental and control groups indicated that there was not a statistically significant difference in their mean scores on any of the self-regulated learning measures (Table 1).

Table 1. *Independent Samples Test for self-regulated learning measures in the pretest*

	Experimental (Pretest) (N=30)		Control (Pretest) (N=30)			
	Mean	S. D.	Mean	S. D.	t	p
Goal Commitment Regulation	8.50	1.98	8.33	2.11	.57	.565
Affective Regulation	10	1.25	9.53	1.11	.86	.388
Social Connection Regulation	12.80	1.54	13	1.41	.79	.432
Resource Regulation	10.70	1.11	11.03	2.03	1.25	.214
Metacognitive Regulation	14.86	1.54	15.20	2.08	1.05	.294
Culture Learning Regulation	6.90	1.21	7.16	1.39	.52	.602

However, the results of posttest in table 2 revealed that the experimental group differed statistically and significantly from the control group on all the self-regulated learning measures. That is to say, compared with the participants in the control group at the posttest, the participants in the experimental group achieved statistically ($P<0.05$) higher mean scores on all self-regulated learning measures.

Table 2. *Independent Samples Test for self-regulated learning measures in the posttest*

	Experimental (Posttest) (N=30)		Control (Posttest) (N=30)			
	Mean	S. D.	Mean	S. D.	t	p
Goal Commitment Regulation	13.60	2.35	9.04	1.73	17.48	.000*
Affective Regulation	18.40	2.87	9.12	2.54	29.62	.000*
Social Connection Regulation	25.43	1.84	12.02	3.01	28.78	.000*
Resource Regulation	20.47	2.17	13.06	2.62	19.58	.000*
Metacognitive Regulation	26.86	2.37	12.74	2.71	31.53	.000*
Culture Learning Regulation	13.58	1.56	7.93	1.94	18.23	.000*

* $p < .05$

ICT contributed to goal commitment regulation

As Zimmerman (2001) pointed out, the first phase in the process of self-regulated learning is "forethought" that involves the setting of goals and strategic planning. Goal setting deals with deciding upon specific outcomes of learning and strategic planning refers to purposive processes and actions the learners take to achieve their goal.

As shown in Table 2, the mean score of the experimental group in goal commitment regulation (M=13.60, S.D. = 2.35) was significantly higher than that of the control group (M=9.04, S.D. = 1.73). Compared with the learners in the control group, the learners in the experimental group are assumed to construct their own meanings and goals from the resources and information available through different forms of the ICTs. As such, having access to language-related resources and tools available through ICTs, the experimental group could select and process materials congruent with their individual preferences and goals at any time and from any places. The results demonstrated that ICTs might help the learners to sustain their interest in achieving their language learning goal as well as help them to persevere in achieving their goal more quickly and efficiently.

It is taken for granted that planning and choosing appropriate activities and strategies are vital for the language learners to achieve their language learning goals. ICTs, as Proske, Narciss, and Körndle (2011) pointed out, due to their unique features in providing multiple sources of information in multiple representation formats as well as establishing multiple interaction possibilities give the learners the chance of choosing from a large pool of information only those pieces essential and appropriate for their language learning goals. Hence, it can be concluded that learning environment differs to the extent that engages learners in self-regulated behaviors. In fact by facilitating a learning environment in which lots of interaction possibilities and multiple sources of information are available, ICTs help learners to become self-directed and accordingly develop their self-regulated learning behaviors.

ICT contributed to affective regulation

It has been argued that cognitive engagement alone cannot ensure effective learning as it requires affective and motivational support (Zimmerman, 2000). In the realm of language learning, *affect* has been considered as a core component of individual differences having a close bearing on second language learning (Ellis, 1994). Correspondingly, Schumann (1997) claimed that *affect* is associated with the degree of motivation and values learners are exhibiting during language learning process. Affective regulation as an aspect of SRL is concerned with regulating emotions and enhancing the attraction of learning. The result of the study indicated that ICT had a contributing role in regulating affective and emotional aspects of language learning in the experimental group (M=18.40, S.D. =2.87). It appears that the ICTs employed in the current study by maintaining the learners' interest and enthusiasm in learning the language had the capacity to decrease the boredom and further increase the enjoyment and emotional engagement of the learners with the language learning process. Not only do the ICTs facilitate collaborative learning but also they can pave the way for personalized and independent learning which is often absent in traditional classroom settings In fact crossing the traditional boundaries of classroom context and providing opportunities for independent and individualized learning, the ICTs enabled the learners to choose their learning materials and worked on them in their own time, at their own pace, and at their own level. When using the ICTs, the learners had greater freedom and control over their learning without constant direction from the teacher. As such the ICTs made the task of language learning a relaxing process and more attractive to

the learners helping them to maintain their interest and enthusiasm. In this case, the ICTs helped the learners not only to monitor and regulate their cognitive activities but also facilitated the regulation of their emotional and motivational processes.

ICT contributed to social connection regulation

In addition to the cognitive activities, as Zimmerman (2001) held, social interactions play a leading role in development of self-regulated learning. Not only is SRL viewed and considered as an individual construct but also a social process with emphasis on the role of social environment and interaction in the SRL development (Diaz, Neal, & Amaya-Williams, 1990; Zimmerman, 2000; Zimmerman & Schunk, 2001).

The results indicated that the ICTs employed in the study bolstered the experimental group's social connection within the language learning perspective (M=25.43, S.D. = 1.84). The study indicated that learners could benefit from electronically mediated social interactions. That is to say, the ICTs foster self-regulated learning via social interactions and collaboration involving the learners within the class and the learners from other contexts in the world. As a matter of fact, the ICTs located the learners in a system of activities and interaction whereby they can use materials and tools to interact with each other and their surroundings.

By means of ICTs such as Skype, blogs and internet, the participants in the experimental group were likely to connect with other learners all over the world in sharing and collaborative activities. Thus, they could search for encouragement and support from other learners of the language. This way, they could increase the time they spend on learning the language.

ICT contributed to resource regulation

As is shown in Table 2, the experimental group's mean score of resource regulation (M=20.47, S.D. = 2.17) was significantly higher than that of the control group (M=13.06, S.D. =2.62). That is to say, the ICTs expanded the learners' learning experience beyond the language classroom. It created and increased opportunities to learn and use the language. Through the ICTs, the learners could seek learning resources and opportunities to help achieve their language learning goals.

This shows that the learners in the experimental group by employing the ICTs could search for learning resources and opportunities to help achieve their goals. They were more likely to look for attractive language learning materials and experiences which were appropriate for their own needs and preferences. Hence, it can be assumed that the way the ICTs were employed in the present study expanded the participants' learning resources as well as created opportunities to learn and use the language either inside or outside the language classroom.

ICT contributed to metacognitive regulation

The second phase of SLR according to Zimmerman (2001) is called "performance" in which learners engage in metacognitive regulation that involves strategies, such as self-instruction, selecting new information sources, summarizing, making inferences, hypothesizing, elaborating and attention focusing (Bernacki, Aguilar, & Byrnes, 2011). In the present study, metacognitive regulation of the experimental group (M=26.86, S.D. =2.37) was significantly higher than that of the control group (M=12.74, S.D. =2.71). This demonstrates that the ICTs enabled the participants to select and plan learning tasks; to use relevant and appropriate materials; and to adjust their language learning goals. In this case, the result is in line with those of Puustinen and Pulkkinen (2001) who argued that self-regulated learning is the process of employing and adjusting cognitive strategies monitored by one's

metacognition. Thus, it can be concluded that the different forms of ICTs employed in the present study promoted self-regulation as manifested in a better metacognitive knowledge about goal commitment and resource regulation.

ICT contributed to culture learning regulation

The integration of cultural knowledge into language learning has been emphasized and also drawn considerable attention (Hall, 1997; Damen, 1987). Mitchell and Myles (2004) stated that "language and culture are not separate, but are acquired together, with each providing support for the development of the other" (p. 235). Culture learning is defined as "the process of acquiring the culture-specific and culture-general knowledge, skills, attitudes required for effective communication and interaction with individuals from other cultures. It is a dynamic, developmental, and ongoing process which engages the learner cognitively, behaviorally, and affectively." (Paige et al., 2003, p. 177). In this study, culture learning regulation refers to the process in which the participants use different forms of ICTs in order to seek answers to the questions about the language and culture and to interact with the target culture so that they can understand and appreciate the target culture better. The results depicted in Table 2 demonstrated that ICT played a significant role in culture learning regulation of the participants in the experimental group (M=13.58, S.D. =1.56). It seemed that the ICTs enhanced the participants' ability to explore the target culture themselves. By providing opportunities for the participants in the experimental group to interact with other learners or speakers of the target language either asynchronously or synchronously, the different forms of ICTs like internet, online chat through Skype, and e-mail appeared to be effective in increasing the participants' cultural knowledge and led to their culture learning regulation. It appears that the ICTs made understanding and appreciating the target culture better by enabling the participants to enter into intercultural communication. In this case, the results of the study support the findings of other researchers (e.g., Chapelle, 2001; Dudeney & Hockly, 2008) who found that technology should be encouraged in classes to expand the learners' cultural awareness and also help them to fashion and refashion their social identity in the target culture. In the same vein, the results of other studies revealed that cultural knowledge can be successfully acquired with the help of technology (e.g., Herron et al., 2000; Hertel, 2003). Thus, the use of technology in fostering cultural learning regulation is important in the EFL context where the learners do not have adequate access to the target language and its culture outside the classroom

Pooling together, the results demonstrated that the different forms of ICTs including internet, e-mail, blogs, Skype, and PowerPoint helped the participants in the experimental group to regulate different aspects of their language learning experience that resulted in effective instruction (e.g., Boekaerts & Corno, 2005; Butler, 2002; Schunk, & Zimmerman, 1998). The study also makes a case for supporting the findings of other researchers (e.g., Bartolomé & Steffens, 2006; Brüggen, 2005; Carneiro, 2006; Steffens, 2006; Trigano; 2006; Veermans, De Jong, & Van Joolingen, 2000) who emphasized the acquisition of self-regulation skills through Information and Communication Technologies. Futhermore, the results reinforce the results of studies that underlined the contribution of self-regulation to the learners' metacognitive, cognitive, behavioral, contextual, and motivational processes (Pintrich, 2000; Wolters, 2003; Zimmerman, 2000).

Conclusion

The major findings of this study suggested that the different forms of ICTs including internet, e-mail, blogs, Skype, and PowerPoint helped to significantly develop English learners' self-regulated learning. The findings suggest that the participants benefited from the technology-enhanced learning environment which had a significant effect on their goal commitment regulation, affective regulation,

social connection regulation, resource regulation, metacognitive regulation, and culture learning regulation. That is to say, technology-enhanced learning environment is a constructive process in which learners regulate and monitor their learning not only cognitively but also motivationally, contextually, and behaviorally. Thus, the ICTs make SRL skills easier to achieve, in that they provide the learners with the chance of selecting, managing, and evaluating their own learning different cultural and educational settings.

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