

The Study of Relationship Between EFL Teacher's Teaching Context and Their Attitudes Towards Computer Assisted Language Learning

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Abstract: The purpose of the present study was to investigate the bond between EFL teacher's perceptions towards the use of computers in EFL context with respect to their teaching profiles (gender, teaching experience and teaching context). To this end, 20 EFL teachers who followed their teaching career in Miyaneh Jihad-e Daneshgahi Language Center were chosen as the sample size. Loyed and Gressard's Computer Attitude Scale was employed as the main instrument for data collection and the reliability was estimated as 0.83 using Cronbach alpha coefficient. To analyze the data, Spearman correlation coefficient (determined by Kolmogorov-Smirnov test) was used. The results indicated that there was an association between teaching context and EFL teacher's attitudes towards the integration of computers in foreign language learning context. In addition, it was reported that there was a linkage between teaching experience and EFL teacher's attitudes towards the use of computers in foreign language learning context. Ultimately, it was found that there was a bond between gender and EFL teacher's attitudes towards the integration of computers. Furthermore, Mann-Whitney test was employed to determine which gender had a stronger attitude towards the use of computers and it was found through the use of this test that male teachers had much more positive attitude towards the use of technology when compared to female teachers.

Key words: Attitude, educational technology, information and communications technology, teaching context, Iran

INTRODUCTION

The purpose of the present study is to examine the association between teaching context and EFL teacher's attitudes towards the use of computer assisted language learning. Thus, the chapter introduces the dimensions of the research topic with an aim to enlighten the way the study is conducted. Henceforth, the problem is stated, the significance of the study is highlighted; the research question and hypothesis are formulated to focus on the research variables. Considering the usefulness of technology integration in classrooms, one can demonstrate that Computer Assisted Language Learning (CALL) forms an effective environment in which learning occurs optimally. Thus, the learners can experience enhanced learning process through the monitoring of teachers on their learning stages or making use of the multi-media content. It is shown in many studies that the use of multi-media, the Internet and different sorts of distance learning bolsters language learning in the new millennium and it assists the language instruction (Shah *et al.*, 1998; Warschauer and Grimes, 2007). As indicated by Mayer, the theoretical justification behind

the interactive media principle is that when both words and pictures are displayed, students have the capacity to establish verbal and pictorial mental models and make meaningful associations between the two.

Several studies and researchers have addressed the importance of technology and technology-driven devices in education. It seems that these studies are good resources to support the significance of the present study in that the present probe aimed at realizing the importance of technology in education from EFL teacher's perspectives in Miyaneh English Institutes. Thus, the researcher attempted to tackle this issue to conclude whether there is a bond between teacher's beliefs and their characteristics.

Literature review: Customary ways to deal with language teaching and learning have been examined by new and creative methodologies, taking into account the most recent advances in ICT innovation. The inconceivable assets and opportunities that ICT offer have developed new instruments, methodologies and systems in language teaching and learning. The achievement of any activities to execute innovation in an instructive project depends

unequivocally upon the backing and attitude of instructors involved. It has been recommended that if instructors accepted or considered computers not to satisfy their own or their students' needs, they are prone to oppose any endeavors to bring innovation into their educating and learning. Computers are progressively far reaching, impacting numerous parts of our social and work lives and some other leisure exercises. As more performances include human computer association, computer aptitudes and learning have turned out to be linked with both occupational and individual achievement. Hence, as one moves into an innovation based society, it is critical that children's classroom interaction with innovation be fair and unbiased for males and females. In most events, the instructor is critical to effective execution of the ICT use in the instructive framework and given that teachers can possibly transmit qualities to the learners, it is imperative to comprehend the biases and generalizations that teachers may hold about the utilization of computers and the variables that perform as facilitators to student certain computer use.

Of the elements that have been inclined to influence the successful utilization of computers in the classroom are teacher's perspectives towards computers and these perspectives, whether positive or negative, influence how teachers react to advances. Thus, it influences the way students understand the significance of computer in schools (Teo, 2006) and influences present and future computer utilization. In accepting the significance of instructor's attitude towards computer use, Zhao *et al.* (2001) estimated that the perspectives of teachers are specifically identified with computer use in the classroom. For instance, instructors frequently perceive the computer as a device to complement housekeeping assignments, monitor their students all the more productively and to deal with parents more effectively. The accomplishment of students interacting with computer innovation will depend to a great extent on the attitudes of teacher and their eagerness to grasp the innovation (Teo, 2008). Evaluating the instructor's perspectives towards computer use may give helpful insights into innovation incorporation and acknowledgment and use of innovation in educating and learning. Regardless of how advanced and effective the state of innovation is, the degree to which it is implemented relies on teachers holding positive attitude towards it (Huang and Liaw, 2005). In this chapter, definition of instructor's attitudes, aspects of attitude, teacher's attitudes and computer technology training, teacher's attitudes and computer technology integration, teacher's attitudes and computer experience, teacher's attitudes and computer anxiety and interest and teacher's attitudes and computer literacy are expounded.

International studies: Teacher's attitudes and levels of technology in classrooms were investigated by Zaidiyeen *et al.* (2010). The data for the study were collected through the use of quantitative data. The survey included questions concerning the level of ICT use as well as questions related to the attitudes of teachers towards the use of ICT. The findings of the study which were obtained by analyzing the data collected from the teachers revealed that, teachers had a low level of ICT use for educational purpose, teachers hold positive attitudes towards the use of ICT and a significant positive correlation between teacher's level of ICT use and their attitudes towards ICT was found. The findings suggest that ICTs use for educational purposes should be given greater consideration than it currently receives. In general, the results were consistent with those previously reported in studies related to the use of ICT in the educational settings.

In a similar study, Shah and Empugan (2015) concentrated on EFL teacher's attitudes toward using ICT in literature lessons. The study revealed that ICT is used on the satisfactory level by the teachers. In addition, the teachers possessed an acceptable positive attitudes towards the use of ICT tools in literature lessons. However, the analysis of the data also showed several challenges that might hamper the possibility of using ICT in literature lessons.

Cubukcuoglu (2013) discussed the factors that encourage Turkish Cypriot teachers to integrate technology into the classroom. The findings indicate that in order to create an environment where technology is used frequently and effectively, it is important to support the needs of teachers in using technology in teaching and learning. In other words, it is important to attempt to remove the possible barriers that hinder frequent technology use and to identify the enablers that promote it.

Abbott and Faris (2000) examined pre-service teachers' attitudes toward the use of computers before and after a semester-long technology literacy course. The results showed that positive attitudes toward computers increased after the course because of the instructional approaches, meaningful assignments requiring technology and supportive faculty. Thus, the researchers claimed that teacher education programs should teach pre-service teachers not only how to use hardware and software but also how to incorporate computers into their teaching strategies and activities. The researchers also noted that small groups and collaborative learning are the most appropriate when introducing new hardware and

software because more advanced and experienced teachers can assist those who need more technology learning support.

Another similar study was conducted by Doering *et al.* (2003), who analyzed pre-service teacher's perspectives regarding ICT in their future classrooms before and after participation in a teacher training program. Prior to taking the training courses, teachers were doubtful about the utility of ICT in the classroom, implying that they would closely examine and consider technology integration, rather than blindly incorporate it into their teaching practices. After completing the courses, their doubt had transformed into more positive sentiments. The teachers had a better understanding about ICT use in the classroom. Although, the teachers confronted other issues such as technology availability, accessibility, professional support and classroom management, their perceptions about technology's role had changed. They were more likely to believe that technology can assist in learning and to recognize its importance.

Serhan and Chai also investigated pre-service teachers' beliefs about the use of computer technology and the effectiveness of ICT courses. The results indicate that after participating in courses, pre-service teachers recognized the importance of technology integration into their curricula and believed that ICT use would enhance student learning. They felt that such courses prepared them to apply ICT in the future and their abilities to select, evaluate and use a variety of technological resources improved.

Choy *et al.* (2009) conducted a mixed study to examine the intentions of pre-service teachers before and after a technology training course. Their intentions were then compared with their actions related to technology integration during their teaching. Confirming previous results from Doering *et al.* (2003), the findings showed that their intentions became significantly more positive ($p < 0.05$) as a result of increased pedagogical knowledge. Nevertheless, these teachers were not able to translate the positive intentions into actual teaching, largely due to unfamiliar school environments. Based on these results, Choy *et al.* (2009) concluded that teacher education programs need to increase awareness of the benefits of integrating technology into student-centered learning approaches and provide pedagogical knowledge related to student-centered learning as well as technology integration strategies.

Local studies: EFL teacher's attitudes toward using computer technology in English language teaching was examined by Gilakjani and Leong (2012). Findings of the

study showed that simply introducing computer technology resources does not guarantee teacher's use of these in practice. Knowledge of EFL teacher's attitudes about teaching, learning and computers, affords them the opportunity to design and implement EFL instruction.

In another study, Nosrati (2015) focused exploring how EFL students and teachers perceive the use of computer technologies and their integration into foreign language teaching and learning. The data were collected through a researcher-made questionnaire distributed to thirty EFL upper-intermediate students and thirty EFL teachers who were selected randomly through convenience sampling respectively. The findings indicated that both teachers and learners had positive attitudes toward computer technology use both in their daily lives and in language instruction. In addition, it was found that there was a significant difference between the teacher's and the learner's attitudes toward internet 2.0 applications, indicating that the use of these internet 2.0 applications were more prevalent among EFL learners.

To address EFL teacher's and student's perspectives on the use of electronic dictionaries for learning English, Dashtestani (2013) conducted a quantitative study. The results of the study suggest that both EFL teachers and students held moderately positive attitudes toward the use of electronic dictionaries for learning EFL. They also indicate that there are several obstacles and challenges, including lack of training on the use of electronic dictionaries, student's use of unsuitable versions of electronic dictionaries, lack of facilities to use electronic dictionaries in EFL classrooms and distraction from learning caused by using electronic dictionaries in the classroom. The analysis of data further revealed that the majority of Iranian EFL students use electronic dictionaries installed on their cellphones. The students showed a preference for using electronic dictionaries over paper dictionaries. The Iranian EFL students reported that they need to receive training on how to select a suitable electronic dictionary and use its services for learning EFL.

Concerning the importance of integrating technology in English language classes, Bolandifar (2013) aimed to find out motivating and preventing factors that led these teachers to use or not to use technology in their teaching process. The analysis of data gathered from interviewing with teachers revealed that EFL teachers showed positive attitudes toward internet usage in general but because of some reasons they utilized it rarely in their teaching. Lack of internet access and computer facilities, insufficient computer skills and lack of time was reported as obstacles to integrate internet in the classrooms.

The effect of technology confidence and computer accessibility on EFL university student's attitudes

towards the use of call in university courses was explored by Alavi and Abdollahpour (2014). Pearson Product Moment and Spearman's rho correlations were run to find relationships between the participant's attitudes towards the application of CALL in language classrooms and technology confidence, computer accessibility, frequency of use and level of education. The results showed that university students generally had strong positive attitudes towards CALL. Significant positive correlations were found between student's attitudes and frequency of computer use, computer access, computer literacy and technology confidence.

In a qualitative study, Mozafari and Wray (2010) studied Iranian EFL teachers' perspectives on their use of ICT in their teaching practices. This study also aimed to explore the individual and socio-cultural factors which influenced and shaped the perspectives and perceptions of these teachers about ICT integration. Arguing from a change or innovation perspective on integrating ICT in schools (in general), some of the well documented key factors that can affect the successful implementation of ICT were outlined. From amongst those factors, the role of the teachers and their pedagogical technological content knowledge (TPACK) emerge from the literature as essential factors.

Rahman strived to examine how teachers perceived the use of computer technology. The results revealed that the teacher teacher's possessed their high attitude towards computer. It also determined that there is no significant difference between male and female in terms of their attitudes toward computer technology.

The review of literature on technology in this part demonstrated those aspects which were related to ICTs for education and ICTs in education. ICTs for education referred to the development of information and communications technology specifically for teaching/learning purposes while the ICTs in education involved the adoption of general components of information and communication technologies in the teaching learning process.

This study concentrated on exploring the role of ICT in education as one progress into new era. In particular, ICTs have impacted educational practice in quite small ways but that the impact will grow considerably in years to come and that ICT will become a strong agent for change among many educational practices. Extrapolating current activities and practices, the continued use and development of ICTs within education will have a strong impact on: ICT and teaching learning process; quality and accessibility of education; learning motivation, learning environment and ICT usage and academic performance. It was found through reviewing the literature on technology

and education that wider availability of best practices and best course material in education which can be shared by means of ICT can foster better teaching and improved academic achievement of students.

As the plethora of studies conducted in the present part indicated, the attention of researchers spins around the importance of technology and the integration of technology in education and related fields; however, scant attention has been paid towards the practical aspect of technology in educational context with respect to the relevant variables, i.e., the personal characteristics.

MATERIALS AND METHODS

Design of the study: Correlation means association, more precisely it is a measure of the extent to which two variables are related. If an increase in one variable tends to be associated with an increase in the other then this is known as a positive correlation. If an increase in one variable tends to be associated with a decrease in the other then this is known as a negative correlation. When there is no relationship between two variables this is known as a zero correlation. Since the purpose of the present study was to examine the association between teaching context, teaching experience, gender and EFL teachers' attitudes towards the use of computer assisted language learning, one can demonstrate that the study follows a correlational design in which the variables act independently.

Participants: The statistical population of the present probe consisted of 20 EFL teachers who followed their teaching career in Miyaneh Jahad-e Daneshgahi English Language Center. Since, the size of population was low, the sample size was determined based on the census method in which all participants were taken into consideration as the sample size and the data were collected from among all these subjects. Teachers of this language center were single and married English instructors of both male and female genders. Also, these teachers were experienced in foreign language teaching in both private and public English Language Institutes.

Instruments: Based on the design of the study which was determined as the correlational, the main instrument to collect the data was questionnaire. In this regard, Loyed and Gressard's Computer Attitude Scale was employed to collect the data from among the participants. In the similar study, Farkas and Murthy made use of this questionnaire to examine the teacher's perspectives towards the use of computers in EFL classrooms. The researchers estimated the reliability of

the afore-mentioned questionnaire as 0.87. Accordingly, the same questionnaire was used in the present study to measure the perspective of Iranian EFL teachers towards the computer technology with respect to their gender, years of experience and teaching context. Using Cronbach alpha coefficient, the reliability was obtained as 0.839. it is worth noting that Loyed and Gressard's Computer Attitude Scale involved 40 items categorized by Likert 5-point scale ranging from strongly agree to strongly disagree. In addition, this questionnaire asked the personal information of respondents, namely, age, gender, years of teaching experience and marital status which were necessary for the descriptive statistics section.

Procedure: As the aim of the present investigation was to find out the linkage between EFL teacher's perceptions of the computer integration in EFL classrooms with respect to their characteristics, the researcher employed the questionnaire as the main instrument for data collection. Initially, the Loyed and Gressard's Computer Attitude Scale was validated by the research supervisor. The overall characteristics of the respondents were included in the upper section of the questionnaire to be answered by the respondents. Subsequently, the questionnaire was introduced to the supervisor of Miyane's Jahad-e Daneshgahi Language Center and the purpose was clarified. Later on, the questionnaire was distributed to the teachers working in the afore-mentioned center who constituted the sample size. Having collected the questionnaire, the researcher obtained the reliability of the questionnaire through the use of Cronbach alpha coefficient which yielded 0.839 value.

Data analysis: Having collected the required information regarding the EFL teacher's perspectives through the distribution of questionnaire, the researcher concentrated on the data analysis. To do so, both descriptive and inferential statistics were considered. Descriptive statistics were mainly concerned with describing the overall characteristics of the participants including the age, gender, level of education, teaching context, marital status and teaching experience. Inferential statistics had

to do with the running statistical tests including Kolmogorov-Smirnov test (to determine the normal or non-normal status of variables distribution) and correlation tests (to determine the existence of association among the variables) (Table 1).

One can conclude from the obtained results, where the levels of significance for Kolmogorov-Smirnov test are reported as 0.018, 0.043 and 0.014 that obtained results of this method confirm the non-normal status of the relevant data. Based on the results of Kolmogorov-Smirnov test, non-normal test is employed to study this hypothesis:

- Null hypothesis: there is no relationship between teaching context and EFL teachers' attitudes towards the use of technology in EFL classes
- Alternative hypothesis: there is a relationship between teaching context and EFL teachers' attitudes towards the use of technology in EFL classes

Statistical hypothesis:

- $H_0: r = 0$
- $H_1: r \neq 0$

Regarding the aim of the present probe on the feasible linkage between teaching context, teaching experience, gender and Iranian EFL teachers' perceptions of the integration of computers in foreign language teaching contexts, following research question was formulated.

RQ: Is there any relationship between EFL teachers' teaching context and their attitudes towards computer assisted language learning?

In order for the research question mentioned to be answered, the researcher considered related hypothesis. This hypothesis was analyzed to yield the final results with respect to the research topic. Prior to initiating the statistical test running, K-S test (Kolmogorov-Smirnov) test was used to determine the normality or non-normal distribution of research variables. The results of K-S test showed that the level of significance is <0.05 ,

Table 1: One-sample Kolmogorov-Smirnov test for research variables

Tests	Variables	Teacher's attitudes towards the use of technology		
		Teaching experience	Teaching context	
Normal parameters ^{a, b}	N	20	20	20
	Mean	3.4000	3.1865	3.1543
	Std. Deviation	0.48573	0.53701	0.55611
Most extreme differences	Absolute	0.190	0.167	0.195
	Positive	0.190	0.167	0.195
	Negative	-0.140	-0.135	-0.119
Kolmogorov-Smirnov Z		1.536	1.447	1.572
Asymp. Sig. (2-tailed)		0.018	0.043	0.014

Table 2: Correlations between teaching context and teachers' attitudes towards the use of technology

Test	Factors	Variables	Teacher's attitudes towards the use of technology	Teaching context
Spearman's rho	Teachers' attitudes towards the use of technology	Correlation coefficient	1.000	0.767**
		Sig. (2-tailed)	-	0.000
		N	20	20
	Teaching context	Correlation coefficient	0.767**	1.000
		Sig. (2-tailed)	0.000	-
		N	20	20

**Correlation is significant at the 0.01 level (2-tailed)

thus Spearman correlation coefficient test was determined to be used to analyze the hypotheses. The rejection of null hypothesis meant the acceptance of the alternative hypothesis, thus, proving the existence of relationship. Consequently, Spearman correlation coefficient was employed which supported the correlation between the variables mentioned in hypotheses. In other words, the results indicated that there was an association between teaching context and EFL teachers' attitudes towards the integration of computers in foreign language learning context.

According to Table 2 and the obtained analysis, the level of significance is 0.000. Since, $p < 0.05$ or Sig. is < 0.05 , null hypothesis is rejected and the alternative hypothesis is accepted. That is to say that there is a relationship between teaching context and teacher's attitudes towards the use of technology in EFL classes. Also, Spearman correlation coefficient is 0.767 which implies that there is a positive and strong relationship between teaching context and teacher's attitudes towards the use of technology.

RESULTS AND DISCUSSION

The new trends in ELT (English Language Teaching) have been directed towards the use of ICTs (Information and Communication Technologies) and teachers play a great part to integrate the technology across language schools. Putting into simpler terms, teachers' attitudes towards the integration of ICT in educational context is the predictive element for the development of language learners since it is argued that it is the attitudes of teachers which pave the way for achieving higher levels of success (Albarracin *et al.*, 2005; Teo, 2008). The way teachers perceive ICT can bolster the framework in which language learning is presented and how the learning process is met. Thus, the perception of language learners can be generated by the usefulness and advantages that such an integration offers within the educational settings. As it was suggested by Summers (1990), the way language teachers see the developments around them can influence their acceptance, way of understanding and outcomes of utilizing computers for the teaching affair.

To examine the bond between teaching context and EFL teacher's perceptions of technology integration was the purpose of the second research question which was analyzed through the use of Spearman correlation coefficient. The results of this test proved the correlation between these two variables, the inference of which can be the fact that teachers who embark on teaching affair across various English institutes argue that it is advantageous to introduce the technology integration and computers in modern teaching context since the development of technology has resulted in challenging attempts for enhancing the teaching and learning environment, the interaction of which can be considered as a new spark for boosting the learning situation. The reported results are consistent with the ones concluded by Hismanoglu (2012). Considering the fact that the majority of English institutes lack the element of enhanced learning environment in terms of the innovative decoration, inclusion of video projects, the internet and technology-based devices, findings of this research question can be extended to other similar studies (Zhao *et al.*, 2000, 2001) which provide the evidence that the computer as a tool can be employed to accomplish housekeeping tasks more effectively, manage the students more efficiently and to communicate with peers more easily. This is also supported by Teo (2006) who confirms that the setting which is equipped with digital devices can arise the incentive within the teacher to embrace new teaching methods.

CONCLUSION

The present study specifically investigated the EFL teacher's attitudes toward the use of computers and its integration into foreign language education. The results gathered were interpreted to mean that the teachers seem to strongly believe in the usefulness of technology resources in improving language instruction. The findings indicated that teachers generally have positive attitudes toward computer technology use both in their daily lives and in language instruction. Moreover, it was presented that there was a relationship between teaching context and EFL teacher's attitudes towards the use of computer technology. Also, it was observed that there was a

relationship between teaching experience and EFL teacher's attitudes towards the use of computer technology. In addition, it was concluded that there was a relationship between gender and EFL teacher's attitudes towards the use of computer technology. Ultimately, Mann-Whitney test indicated that male teachers had much more positive attitude towards the use of computer technology when compared to female teachers.

REFERENCES

- Abbott, J.A. and S.E. Faris, 2000. Integrating technology into preservice literacy instructions a survey of elementary education students' attitudes toward computers. *J. Res. Comput. Edu.*, 33: 149-161.
- Alavi, S. and M. Abdollahpour, 2014. The effect of technology confidence and computer accessibility on EFL university students attitudes towards the use of CALL in university courses. *Int. J. Lang. Learn. Appl. Linguistics World*, 7: 289-299.
- Albarracin, D., B.T. Johnson, M.P. Zanna and G.T. Kumkale, 2005. Attitudes: Introduction and Scope. In: *The Handbook of Attitudes*, Albarracin, D., B. Johnson and M. Zanna (Eds.). Lawrence Erlbaum Associates, New Jersey, USA., pp: 3-19.
- Bolandifar, S., 2013. Teachers attitudes toward interchanging internet technology in English language classes. *IJLLALW*, 4: 81-93.
- Choy, D., A.F. Wong and P. Gao, 2009. Student teachers intentions and actions on integrating technology into their classrooms during student teachings: A Singapore study. *J. Res. Technol. Edu.*, 42: 175-195.
- Cubukcuoglu, B., 2013. Factors enabling the use of technology in subject teaching. *Int. J. Edu. Dev. Using Inf. Commun. Technol.*, 9: 50-60.
- Dashtestani, R., 2013. EFL teachers and students perspectives on the use of electronic dictionaries for learning english. *CALL. E. J.*, 14: 51-65.
- Doering, A., J. Hughes and D. Huffman, 2003. Preservice teachers: Are we thinking with technology?. *J. Res. Technol. Edu.*, 35: 342-361.
- Gilakjani, A.P. and L.M. Leong, 2012. EFL teachers attitudes toward using computer technology in english language teaching. *Theor. Pract. Lang. Stud.*, 2: 630-636.
- Hismanoglu, M., 2012. The impact of a curricular innovation on prospective EFL teachers attitudes towards ICT integration into language instruction. *Online Submission*, 5: 183-202.
- Huang, H.M. and S.S. Liaw, 2005. Exploring users' attitudes and intentions toward the web as a survey tool. *Comput. Hum. Behav.*, 21: 729-743.
- Mozafari, P. and D. Wray, 2010. Iranian EFL teachers' perspectives on their use of ICT in their teaching practices: A multiple case study. *IJLLALW.*, 5: 27-34.
- Nosrati, V., 2015. Teachers' and learners' attitudes toward the use of Web-Based Language Learning (WBLL). *J. Appl. Ling. Lang. Res.*, 2: 1-12.
- Shah, P., J. Emoungan and J.B. Son, 1998. Understanding hypertext: A discussion for TEFL. *English Teach.*, 53: 113-124.
- Shah, P.M. and J.L. Empungan, 2015. ESL teachers' attitudes towards using ict in literature lessons. *Int. J. English Lang. Educ.*, 3: 201-218.
- Summers, M., 1990. New student teachers and computers: An investigation of experiences and feelings. *Educ. Rev.*, 42: 261-271.
- Teo, T., 2006. Attitudes toward computers: A study of post-secondary students in Singapore. *Interactive Learning Environ.*, 14: 17-24.
- Teo, T., 2008. Assessing the computer attitudes of students: An Asian perspective. *Comput. Hum. Behav.*, 24: 1634-1642.
- Warschauer, M. and D. Grimes, 2007. Audience, authorship and artifact: The emergent semiotics of Web 2.0. *Ann. Rev. Appl. Ling.*, 27: 1-23.
- Zaidiyeen, N.J.A., L.L. Mei and F.S. Fook, 2010. Teachers attitudes and levels of technology use in classrooms: The case of Jordan schools. *Int. Edu. Stud.*, 3: 211-221.
- Zhao, Y. and G.A. Cziko, 2001. Teacher adoption of technology: A perceptual control theory perspective. *J. Technol. Teach. Educ.*, 9: 1-16.
- Zhao, Y., S.H. Tan and P. Mishra, 2000. Teaching and learning: Whose computer is it?. *J. Adolesc. Adult Literacy*, 44: 254-348.