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The Role of Social Learning Networks in Mobile Assisted Language Learning: Edmodo as a Case Study

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Abstract: In this study the effect of the Edmodo social learning environment on mobile assisted language learning (MALL) was examined by seeking the opinions of students. Using a quantitative experimental approach, this study was conducted by conducting a questionnaire before and after using the social learning network Edmodo. Students attended lessons with their mobile devices. The course materials were shared in the network via Edmodo group sharing tools. The students exchanged idea and developed projects, and felt as though they were in a real classroom setting. The students were also able to access various multimedia content. The results of the study indicate that Edmodo improves students' foreign language learning, increases their success, strengthens communication among students, and serves as an entertaining learning environment for them. The educationally suitable sharing structure and the positive user opinions described in this study indicate that Edmodo is also usable in other lessons. Edmodo can be used on various mobile devices, including smartphones, in addition to the web. This advantageous feature contributes to the usefulness of Edmodo as a scaffold for education.

Keywords: MALL, Edmodo, social learning networks, mobile learning
Categories: L.6.0, L.1.4, L.6.1, L.3.0

1 Introduction

Mobile technologies are one of the most frequently used technology in this era. Various types of mobile devices are introduced day to day. For that reason, the integration of mobile technologies with classroom-based education is unavoidable. However, when we integrate mobile learning environments into our classrooms, teachers are required to know how to use and support that technology [Kukulska-Hulme and Shield, 08]. In our classrooms, the use of popular mobile applications that are familiar to teachers and students improves the motivation of students to learn. The use of mobile technologies in the classroom also stimulates students while they learn new material [Pachler et al., 10]. Due to strong mobile technology infrastructure in communication and Internet connections, students can benefit from both formal and informal learning methods [Rau et al., 08]. With the development of Web 2.0 and mobile applications, many social networking sites have been published. Some authors argue that Web 2.0 tools actually work in harmony with social learning institutions [Shen et al., 06; Trentin, 09; Benli and Dogan, 11; Al-Mukhtar and Murad, 12]. In addition, studies have shown that Web 2.0 tools and mobile applications provide opportunities for creating interactive learning environments [Kim et al., 09; Bouyer, 11; Tavukcu et al., 09]. Mason and Rennie [08] concluded that learning environments created with Web 2.0 facilitate communication between students, and provide

opportunities to create communities. It is clear from previous studies that many people use Web 2.0 tools. [Ullrich et al., 08] concluded that limited lesson time could be used more effectively if Web 2.0 tools were included. Moreover, Greenhow, Robelia and Hughes [09] argued that Web 2.0 tools support social and collaborative learning institutions. In addition, [Gunawardena et al., 09] noted that distance education students that use Web 2.0 tools learn more effectively because the tools support information-sharing among students and teamwork. Hughes [09] similarly concluded that using these tools in distance education benefits learners, and helps maximize the interactions among them. Social networking sites have also continued to grow over time, both in terms of development and number of users [Gross and Acquisti, 05].

Twitter, Friendfeed, Myspace, and Google+ were the most commonly used social networking sites, Facebook has since become dominant. Facebook's social networking site continues to attract an increasing number of users; therefore its usage also continues to increase [Uzunboylu et al., 11; Bicen et al., 14]. The popularity of Facebook can be attributed to its ease of usability, and the ease of adaptation of the tools it offers. Facebook's users have the opportunity to easily connect wherever they are. Edmodo is a social learning web that was developed on the basis of Web 2.0 developments and mobile-assisted learning. Edmodo includes a social learning area where teachers, students, and parents can interact. Both web-based and mobile application versions are available [Balasubramanian et al., 14].

The difference between Facebook and Edmodo is that the latter is heavily learning-focused. Edmodo has an online profile, share, and communication structure that is similar to Facebook. However, there is also an extensive social learning area for assigning grades, administering questionnaires and quizzes, making announcements, assigning homework, and developing libraries, etc. [Patrisiane et al., 13]. Because of these features, Edmodo is a learning environment that can be useful in mobile-assisted language learning (MALL). Mobile-assisted language learning is a reinforcement approach that supports language learning via the use of mobile devices [Kukulska-Hulme and Shield, 08]. [Valk et al., 10] discussed the positive effects of MALL and how it provides an alternative learning and teaching environment and increases motivation. According to the study carried out by [Veerappan et al., 14], the majority of students and academicians prefer MALL and believe that it provides a significant contribution to learning. With the recent popularity of mobile Internet and smartphones, mobile devices have become an inevitable tool for informal education [Hsu et al., 06]. Consequently, many mobile applications for learning languages have been developed, and students have the opportunity to improve language skills whenever they want [Stockwell, 08; Prensky, 05]. This study examines the effectiveness of students who use the social learning network Edmodo in MALL.

1.1. Related Research

Liu, Lu, and Lai [14] reviewed the literature and reported that most researchers use smartphones and Ipads in MALL. However, they suggested that teachers and academicians encounter difficulties using those areas during their teaching. The authors concluded that there is a need for more cognitive studies in the areas of communication and learning. [Leow et al., 14] stated that people can realize their attempts to learn a language by engaging in discussions in mobile chat rooms.

[Veerappan et al., 14] found that mobile technologies have reached the classroom setting, but identified problems with their use, including the choice of mobile device, pricing, and network coverage. The study included 56 academicians and 196 undergraduate students in Malasia, and the students' level of readiness was measured. The study reported three main findings. First, students connected to the Internet via wi-fi. Second, most academicians preferred a mobile-supported educational system. Third, many of the students owned a mobile device. [Kalati and Tesol, 14] analyzed the acceptance of mobile devices by undergraduate students in Iran who were learning English vocabulary. Thirty-six students were included in the quantitative study. The authors found that 72% of the students preferred to use a mobile device while learning English, and 64% preferred to use a mobile device while learning English vocabulary. Miraz and Ali [14] reviewed the literature and found that MALL assists in the comprehension of language and punctuation, and provides learning effectiveness. Azar and Nasiri [14] found that MALL is a rich teaching and learning environment that improves the speaking and listening skills of learners. [Segaran et al., 14] studied the effectiveness of a 3D mobile application that they had developed for second language learning. They found a positive influence of the application on pronunciation. Chen [13] conducted a study that included students using tablets. He found that tablets have an interactive and cooperative structure that can be accessed from anywhere. He also stated that student satisfaction increased with the discovery of new information while learning a new language.

2 Purpose of the Study

The purpose of this study was to examine the effectiveness of students in MALL using the social learning network Edmodo. To achieve this purpose, the answer to a question was sought: What is the effectiveness of students who use Edmodo during MALL?

3 Methodology

This experimental study was conducted with the participation of students who study in the education faculty. It was conducted using the Edmodo social learning network in MALL. The study took place over 25 hours across 5 weeks. Students attended lessons with their mobile devices. The course materials were shared on the network using Edmodo's group sharing tools. Some of the tools used included *Note* for announcements, *Alert* for warnings, *Assignment* for homework, *Quiz* for pilot tests, and *Polls* for process evaluation. In addition, students were able to contact their teachers via private message. They also were able to exchange ideas with other students during project development.

A total of 37 students participated in the study. The students were chosen randomly from among a group of students who wanted to improve their foreign language skills. Ten of the teachers were female (27%) and the remaining 27 were male (73%). The average age of the students who participated in the study was 21.

The research data were collected via a questionnaire tool developed by the researcher. The tool consisted of 26 positive statements [Table 1], each of which was

associated with a 5-point Likert scale. A score of '1' corresponded to 'Strongly Disagree', and '5' corresponded to 'Strongly Agree'. The questionnaire was introduced to the teachers twice; first at the beginning of the study, and again at its conclusion. To assess the scope of the scale's reliability, the opinions of 15 educational technology experts were sought and regulations were implemented based on their recommendations, and by subsequently implementing this scale to 90 students. The validity of the scale was assessed via Cronbach's alpha coefficient. The coefficient for the scale was 0.95. Mean Pre-test and post-test point scores were compared using a paired sample *t*-test. The descriptiveness of the scale was also considered.

4 Application

4.1 Preparation of the Edmodo Social Learning Environment

The students group was first formed during preparation of the Edmodo social environment. Among this group, the course trainer had the option to load course content and related material using the shared tool files found in Edmodo's Note application. In addition, Internet links could be uploaded using the link tools. The files uploaded using the link tools were a word file, website information, an audio file, and a YouTube video.

In addition to the file and link tools, before each lesson the course instructor had the option to form his or her own library for the cyber classroom environment using Edmodo's Library. The instructor then shared the files with the teachers. In addition, cloud files could also be uploaded to the library from Google Drive.

After preparing the course content, the course instructor had the option to set the date and time for messages and file sharing using the Schedule Message link and Note sharing tool. The students contributed to the shared content by contributing different files and links, and also by adding comments. The course instructor issued special warnings to the students who failed to comment on the shared lesson posts using the Alert tool. This tool was also used to remind students about impending homework deadlines. The Assignment tool was used to assign homework to students and select submission dates. Edmodo's Quiz tool was used to reinforce topics during the lesson. Thus, the students were able to test themselves. Evaluations were conducted after each lesson using the Poll tool.

4.2 Implementation

After determining the purpose of the study, a pre-test questionnaire was administered to the students in order to assess their opinion of the use of the Edmodo social learning environment in mobile assisted learning. The students attended 25 hours of mobile assisted learning using Edmodo over 5 weeks, and prepared for each lesson in three ways. First, they accessed the lesson content through the Edmodo application on their mobile devices before each lesson. Second, they read this content before attending the lesson. Third, they made comments to the group on Edmodo before coming to the lesson. The students, who attended the implementation, completed homework consisting of study questions on mobile assisted learning. They also filled

out forms related to lesson content during instruction. These activities contributed to the abilities of the teachers to improve student foreign language learning. During the course, the students also contributed to the foreign language learning of their peers by sharing social videos, audio files, helpful links, and various documents via Edmodo group. In addition, the students wrote comments to each other using various commenting functions to correct the grammar mistakes of their classmates.

5 Results and Discussion

Table 1 shows mean (± standard deviation) pre-test and post-test point scores for statements concerning the use of Edmodo in MALL. While pre-test responses indicated that students were unsure about the use of Edmodo before before the study, post-test scores indicated a generally positive opinion of Edmodo in MALL.

Statements	Pre-test		Post-test	
	Mean	**SD**	**Mean**	**SD**
1. Edmodo is a tool that can be used in MALL.	2.64	0.71	4.59	0.49
2. Edmodo significantly contributes to language learning.	2.78	0.75	4.62	0.49
3. Foreign language skills are improved via discussions on Edmodo.	2.54	0.55	4.48	0.50
4. Video and audio files shared on Edmodo contribute to pronunciation development.	2.59	0.55	4.54	0.50
5. Using Edmodo in MALL increases the level of learning success.	2.54	0.55	4.48	0.50
6. There is an increased interest in foreign language from the lessons on Edmodo.	2.64	0.53	4.59	0.49
7. The tests on Edmodo *Quiz* provided opportunities to practice foreign language.	2.86	0.41	4.81	0.39
8. On Edmodo the students follow the projects of other students and this contributes to project development.	2.67	0.52	4.62	0.49
9. The lessons conducted with the support of Edmodo are more interesting.	2.62	0.54	4.56	0.50
10. I push myself to understand the announcements on Edmodo and write answers for them.	2.78	0.47	4.72	0.45
11. I complete my duties before the teacher sends a warning message about the homework deadline..	2.64	0.53	4.59	0.49
12. I submit my homework on time on Edmodo.	2.51	0.55	4.45	0.50
13. I proofread my homework on Edmodo with my friends before uploading it to the group.	2.91	0.36	4.86	0.34
14. I find new resources to contribute to the contents that my teacher has published on Edmodo and upload them to the Edmodo site.	2.91	0.36	4.86	0.34
15. The ability to connect to Edmodo with my smart phone whenever I want contributes greatly to my foreign language learning.	2.86	0.41	4.81	0.39

16. The rich support of the materials shared on Edmodo is important to my foreign language learning.	2.86	0.41	4.81	0.39
17. The ability to communicate with foreign teachers on Edmodo contributes to my foreign language development.	2.75	0.49	4.70	0.46
18. I push myself to learn a foreign language by trying to write sentences on Edmodo.	2.89	0.39	4.83	0.37
19. I am motivated to constructively criticize my friends' writings on Edmodo and correct their grammar.	2.94	0.32	4.89	0.31
20. Edmodo-supported foreign language education provides learning that is supported by multimedia.	2.81	0.46	4.75	0.43
21. I am excited to receive notifications from Edmodo.	2.86	0.41	4.81	0.39
22. I share information that I find from various Edmodo-supported foreign language education resources.	2.70	0.51	4.78	0.41
23. I don't have difficulty communicating with my friends in a foreign language while using Edmodo.	2.81	0.46	4.75	0.43
24. Following the professional pages of content on Edmodo contributes to my improvement.	2.86	0.41	4.81	0.39
25. Edmodo contributes to foreign language thinking skills.	2.83	0.44	4.78	0.41
26. Edmodo should be used to support other lessons.	2.78	0.47	4.72	0.45

Table 1: Pre- and post-test point scores (mean ± standard deviation; SD).

Table 1 shows mean (± standard deviation) pre-test and post-test point scores for statements concerning the use of Edmodo in MALL.

Analysis of the mean pre-test and post-test point scores [see Table 2] revealed a significant difference ($t = 35.93$, $p < 0.05$). While the students were undecided before the study about the effectiveness of Edmodo in MALL (M = 2.75, SD = 0.28), there was a marked positive increase in the opinions of students after the study (M = 4.70, SD = 0.21).

Using Edmodo in Mobile-Assisted Language Learnnig								
		N	***M***	**SD**	**df**	***t***	**p**	**Explanation**
General Point	Pre-test	37	2.75	0.28	36	35.939	0.000	P<0.05 Difference
	Post-test	37	4.70	0.21				

Table 2: Pre- and post-test point averages

The mean difference is significant at alpha = 0.05. In addition to the quantitive effects described above, this study also allowed for a qualitative assessment of Edmodo in

MALL. After the course, a number of students noted the following positive benefits or impressions of Edmodo:

- Language improvement
- Enables an initial increase
- Strengthened communication between students
- Research motivation
- Creation of a fun learning environment
- Opportunities for students to challenge themselves while learning
- Guidance for students with respect to mistakes
- Improved perspective by creating contact with professionals
- Improved study efficiency
- Increased critical thinking in language learning
- Edmodo is an effective tool in MALL

The students stated that Edmodo is an important tool in MALL and that it provides a significant contribution to language learning. The group tool on Edmodo increased the success of foreign language learning through student participation in activities outside of the classroom and the discussion of language. The video and audio files that were shared on Edmodo improved pronunciation. In lessons carried out with mobile assistance and Edmodo, the students stated that their interest in the lessons increased. They also noted improved language practice due to exams and quizzes on Edomodo, and contributions made to the projects of other students whom they had been following. The students stated that lessons conducted with the assistance of Edmodo were more fun. Students who stated that they challenged themselves in order to understand and write better responses to the announcements on Edmodo also noted that they proofread their homework with their friends before uploading it to the site, and frequently finished their assignments before the teacher published a warning about the due date. In addition, students pointed out that they could access Edmodo whenever and wherever they wanted, that the rich material support helped significantly in language learning, and that they forced themselves to practice sentence writing. The learners also constructively criticized their friends' writing, motivated themselves by checking grammar, and waited excitedly for new notifications. As a result of Edmodo-assisted language learning, the students said that they felt the need to find information on Edmodo from various sources and share it on the professional pages that they follow outside of class, and that this helped to improve language learning. They also suggested that Edmodo should be used as a support in other lessons as well.

6 Conclusion

This study aimed to demonstrate the practicality of using Edmodo as a MALL social learning environment by considering the opinions of students. According to pre-test point scores, the students were undecided regarding the utility of Edmodo in MALL at the start of the study. At the end of the course, the students' views on Edmodo were positively biased. These findings indicate that the Edmodo application is a valuable tool that can be used in MALL. Moreover, the questionnaire responses indicated that Edomodo provides a fun learning environment that enables students to improve language learning, improve success, and strengthen inter-student communication. The sharing structure of Edmodo and the positive feedback obtained in this study suggest that it could be similarly used in other lessons too. A large advantage to the educational use of Edmodo is the fact that it is not only web-based, but can also be used on mobile devices and smartphones. Future studies will focus on preparing and applying environments for various learning needs and determining which lessons are most positively impacted by the inclusion of Edmodo, as determined through the eyes of students and teachers.

References

[Al-Mukhtar and Murad, 12] AL-Mukhtar M., Murad H.: A flexible web-based platform for distance learning. *AWERProcedia Information Technology & Computer Science*, *1*(1), (2012) 490-495. Retrieved from http://www.world-education-center.org/index.php/P-ITCS/article/view/847/958

[Azar and Nasiri, 14] Azar, A., Nasiri, H.: Learners' attitudes toward the effectiveness of mobile assisted language learning (MALL) in L2 listening comprehension. *Procedia - Social and Behavioral Sciences*, *98*(1), (2014) 1836–1843. Retrieved from http://www.sciencedirect.com/science/article/pii/S1877042814027049

[Balasubramanian et al., 14] Balasubramanian K., Jaykumar V., Fukey L.: A study on student preference towards the use of Edmodo as a learning platform to create responsible learning environment. *Procedia - Social and Behavioral Sciences*, *144*(1), (2014) 416–422. Retrieved from http://www.sciencedirect.com/science/article/pii/S1877042814042396

[Benli and Dogan, 11] Benli, E., Dogan, A. The effect of online-based prepared posters on students' attitude toward science and technology course. *Global Journal Of Information Technology*, *1*(1), (2011) 1-4. Retrieved from http://www.world-education-center.org/index.php/gjit/article/view/1056

[Bicen et al., 14] Bicen, H., Ozdamli, F., Uzunboylu, H.: Online and blended learning approach on instructional multimedia development courses in teacher education. *Interactive Learning Environments*, *22*(4), (2014) 529-548. doi:10.1080/10494820.2012.682586

[Bouyer, 11] Bouyer, A.: A new approach for evaluating the virtual education of students using association rule-mining in cloud computing environments. *Global Journal Of Computer Science*, *1*(1), (2011) 1-6. Retrieved from http://www.world-education-center.org/index.php/gjcs/article/view/1047/684

[Chen, 13] Chen, X. B.: Tablets for informal language learning: student usage and attitudes. *Language Learning & Technology*, *17*(1), (2013) 20–36. Retrieved from http://llt.msu.edu/issues/february2013/chenxb.pdf

[Greenhow et al., 09] Greenhow, C., Robelia, B., Hughes, J. E.: Research on learning and teaching with Web 2.0: bridging conversations. *Educational Researcher*, *38*(4), (2009) 280-283. doi:10.3102/0013189X09336675

[Gross and Acquisti, 05] Gross, R., Acquisti, A.: Information revelation and privacy in online social networks. *WPES '05 Proceedings of the 2005 ACM workshop on privacy in the electronic society*, *1*(1), (2005) 71-80. doi:10.1145/1102199.1102214

[Gunawardena et al., 09] Gunawardena, C. N., Hermans, M. B., Sanchez, D., Richmond, C., Bohley, M., Tuttle, R.: A theoretical framework for building online communities of practice with social networking tools. *Educational Media International*, *46*(1), (2009) 1-4. doi:10.1080/09523980802588626

[Hsu, et al., 06] Hsu, M., Yen, C., Chiu, C., Chang, C.: A longitudinal investigation of continued online shopping behavior: An extension of the theory of planned behavior. *International Journal of Human-computer Studies / International Journal of Man-machine Studies*, *6*(9), (2006) 889-904. doi:10.1016/j.ijhcs.2006.04.004

[Hughes, 09] Hughes A.: Higher education in a Web 2.0 world. *JISC Publications*. (2009) Retrieved from http://www.jisc.ac.uk/publications/generalpublications/2009/heweb2.aspx

[Kalati and Tesol, 14] Kalati, E. A., Tesol, M. A.: Mobile assisted language learning. *Annual Scientific Conference: Path of Imagination*. (2014) Retrieved from https://www.researchgate.net/publication/270565137_Mobile_Assisted_Language_Learning

[Kim et al., 09] Kim, B., Park, H., Baek, Y.: Not just fun, but serious strategies: Using meta-cognitive strategies in game-based learning. *Computers and Education*, *52*(4), (2009) 800-810. doi:10.1016/j.compedu.2008.12.004

[Kukulska-Hulme and Shield, 08] Kukulska-Hulme, A., Shield, L.: An overview of mobile assisted language learning: From content delivery to supported collaboration and interaction. *RECALL*, *20*(3), (2008) 271-289. doi:10.1017/S0958344008000335

[Leow et al., 14] Leow, C. K., Yahaya, W. W., Samsudin, Z.: Mobile assisted second language learning: developing a learner-centered framework. *International Conference on Educational Technologies*, (2014) 27-34.

[Liu et al., 14] Liu, G., Lu, H., Lai, C.: Towards the construction of a field: the developments and implications of mobile assisted language learning (MALL). *Digital Scholarship in the Humanities*, *1*(1), (2014) 1-17. Retrieved from http://dx.doi.org/10.1093/llc/fqu070

[Mason and Rennie, 08] Mason R., Rennie F.: *E-learning and social networking handbook*. (2008) Abingdon: Taylor & Francis.

[Miraz and Ali, 14] Miraz, S., Ali, M.: An overview of mobile assisted language learning (MALL). *International Conference on eBusiness, eCommerce, eManagement, eLearning and eGovernance*, *1*(1) (2014).

[Pachler et al., 10] Pachler, N., Cook, J., Bachmair, B.: Appropriation of mobile cultural resources for learning. *International Journal of Mobile and Blended Learning*, *2*(1), (2010) 1-21.

[Patrisiane et al., 13] Patrisiane, V., Inggrit, S., Sanjaya, R.: Comparison between Edmodo, Facebook, and Moodle to maximize the E-Learning benefits. *eLAP2013*, *19*(1) (2013). Retrieved from http://www.elearningap.com/eLAP2013/Proceedings/19_Full_Viena.pdf

[Prensky, 05] Prensky, M.: What can you learn from a cell phone? almost anything! *Innovate Journal of Online Education*, *1*(1), (2005) 1-11.

[Rau et al., 08] Rau, P. P., Gao, Q., Wu, L.: Using mobile communication technology in high school education: Motivation, pressure, and learning performance. *Computers & Education*, *50*(1), (2008) 1-22. doi:10.1016/j.compedu.2006.03.008

[Segaran et al., 14] Segaran, K., Ali, A. Z., Hoe, T. W.: Usability and user satisfaction of 3D talking-head mobile assisted language learning (MALL) app for non-native speakers. *Procedia - Social and Behavioral Sciences*, *131*(1), (2014) 4–10. Retrieved from http://www.sciencedirect.com/science/article/pii/S1877042814029796

[Shen et al., 06] Shen, J., Hiltz, S. R., Bieber, M.: Collaborative online examinations: Impacts on interaction, learning, and student satisfaction. *IEEE Transactions on Systems, Man, and Cybernetics*, *36*(6), (2006) 1045-1053. doi:10.1109/TSMCA.2006.883180

[Stockwell, 08] Stockwell, G.: Investigating learner preparedness for and usage patterns of mobile learning. *ReCALL*, *20*(1), (2008) 253–270.

[Tavukcu et al., 09] Tavukcu, T., Gezer, F., Ozdamli, F.: Determination of the views and success levels towards spreadsheets of university students studying with blended learning and e-learning. *International Journal of Learning And Teaching*, *1*(1), (2009) 10-15. Retrieved from http://www.world-education-center.org/index.php/ijlt/article/view/325

[Trentin, 09] Trentin, G.: Using a wiki to evaluate individual contribution to a collaborative learning project. *Journal of Computer Assisted Learning*, *25*(1), (2009) 43-55. doi:10.1111/j.1365-2729.2008.00276.x

[Ullrich et al., 08] Ullrich, C., Borau, K., Luo, H., Tan, X., Shen, L., Shen, R.: Why Web 2.0 is good for learning and for research: principles and prototypes. *17th International World Wide Web Conference*, *17*(1), (2008) 705-714. doi:10.1145/1367497.1367593

[Uzunboylu et al., 11] Uzunboylu, H., Bicen, H., Cavus, N.: The efficient virtual learning environment: A case study of Web 2.0 tools and Windows live spaces. *Computers & Education*, *56*(3), (2011) 720-726. doi:10.1016/j.compedu.2010.10.014

[Valk et al., 10] Valk, J. H., Rashid, A., Elder, L.: Using mobile phones to improve educational outcomes: an analysis of evidence from Asia. *International Review of Research in Open and Distance Learning*, *11*(1), (2010) 117–140.

[Veerappan et al., 14] Veerappan, V., Wei, H. S., Wong, S. P., Paramasivam, S.: Mobile assisted teaching and learning in an institute of higher education. *International Review of Social Sciences and Humanities*, *8*(1), (2014) 68-79.