Journal of Personalized Learning, *2*(1) 2016, 95-103.

SCAFFOLDING A CONCEPTUAL SUPPORT FOR PERSONALIZED ARABIC VOCABULARY LEARNING USING AUGMENTED REALITY (AR) ENHANCED FLASHCARDS

Nurkhamimi Zainuddin (Corresponding Author)
Fakulti Pengajian Bahasa Utama, Universiti Sains Islam Malaysia
Bandar Baru Nilai, 71800 Nilai, Negeri Sembilan, MALAYSIA
khamimi@usim.edu.my

Muhammad Sabri Sahrir
Kulliyyah of Islamic Revealed Knowledge and Human Sciences,
International Islamic University Malaysia,
53100 Kuala Lumpur, MALAYSIA
muhdsabri@iium.edu.my

Rozhan M. Idrus
Fakulti Sains dan Teknologi, Universiti Sains Islam Malaysia
Bandar Baru Nilai
71800, Nilai, Negeri Sembilan, MALAYSIA
rozhan@usim.edu.my

Mohammad Najib Jaffar
Fakulti Pengajian Bahasa Utama, Universiti Sains Islam Malaysia
Bandar Baru Nilai
71800, Nilai, Negeri Sembilan, MALAYSIA
najib@usim.edu.my

ABSTRACT

Technology Enhanced Learning (TEL) research has increasingly focused on emergent technologies such as Augmented Reality (AR), game and mobile to improve self-motivation and self-engagement of the learners in an appealing hybrid learning environment. This paper describes the development process of an augmented reality (AR) enhanced flashcards for non-native students of Universiti Sains Islam Malaysia (USIM) in scaffolding the memorization and retention of basic Arabic vocabulary through the inclusion of personalized learning using an application known as Aurasma. The study involved 24 elementary-level students in USIM and data collection was conducted by observing the students' response and understanding in using the AR enhanced flashcards for personalized Arabic vocabulary learning. Findings indicated that the AR enhanced flashcards help in scaffolding the knowledge regarding the Arabic vocabulary learning. Furthermore, the findings showed that the AR enhanced flashcards facilitate the process of Arabic vocabulary personalized learning. The study showed that the augmented reality could be considered as one of the personalized learning platform that can be used to help students in memorizing certain information and maintained their knowledge of Arabic vocabulary, and creating novel sentences by using the target vocabularies more than half of the time.

Keywords: Augmented Reality, Arabic vocabulary, scaffolding, personalised learning content, non-native speakers.

INTRODUCTION

In recent years, technology-enhanced learning (TEL) research has increasingly focused on emergent technologies such as augmented reality, ubiquitous learning (u-learning), mobile learning (m-learning), serious games and learning analytics for improving the satisfaction and experiences of the users in enriched multimodal learning environments (Johnson et al., 2014). These researches take advantage of technological innovations in hardware and software for mobile devices and their increasing popularity

To cite this document:
Zainuddin, N., Sahrir, M. S., Idrus, R. M., & Jaafar, M. N. (2016). Scaffolding a conceptual support for personalized arabic vocabulary learning using augmented reality (ar) enhanced flashcards. *Journal of Personalized Learning*, *2*(1): 102-110.

Journal of Personalized Learning, *2*(1) 2016, 95-103.

among people as well as the significant development of user modeling and personalization processes which place the student at the center of the learning process. In particular, augmented reality (AR) research has matured to a level that its applications can now be found in both mobile and non-mobile devices. Research on AR has also demonstrated its extreme usefulness for increasing the student motivation in the learning process (Bujak et al., 2013; Chang et al., 2014).

Universiti Sains Islam Malaysia (USIM) has been utilizing its role in cultivating the innovative pedagogies in personalized Arabic teaching and learning for students at the university level (Zainuddin et al., 2015). In order to achieve the objectives of the university in Arabic language teaching, USIM used a number of personalized learning platforms such as Open Learning, I-Tunes U and Moodle. The university believes that these platforms can provide lecturers and students new experiences in the process of Arabic teaching and learning. The primary goal of this university is continuous improvement to reach students' proficiency for most of the skills and to be the global reference center for the integration of Naqli and Aqli knowledge. It is necessary to keep up with the technological development, live with it and use it in personalized teaching and learning environment.

Initially, the teaching of Arabic language can no longer rely solely on traditional methods of learning, such as note taking and lecturing, which are still largely preferred among Arabic lecturers as mentioned by Zainuddin & Sahrir (2016). The researchers' early analysis and observation entail that the lack of use of instructional technologies in teaching and learning Arabic has hindered the memorization process of Arabic vocabulary taught in the classroom. The problems and arising needs of using instructional technologies in Arabic language learning such as Arabic courseware have been discussed and proposed by Ismail (2008).

The Augmented Reality functions as a tool in e-learning increased content understanding, learning spatial structures, language associations, long-term memory retention, improved collaboration and motivation (Radu, 2014). Its implementation should be handled by educators and experienced trainers, with extensive knowledge and understanding on learner's intrinsic and extrinsic motivations thus producing a successful personalized environment. Augmented reality has unexplored potential in education and its ability to seamlessly support students in a natural environment. This area of research is limited due to several factors: (a) most tools being used to view augmented reality flashcards are dated (Smith et al., 2007), (b) most studies focus on engagement, motivation, recall, and collaboration, not specifically vocabulary word attainment (Smith et.al, 2007). According to Dede et al. (2007), uses of information technology to enhance constructivist learning environments have centered on creating computational tools and virtual representations that students can manipulate.

There are many studies on the effectiveness of combining multimedia and hypermedia with learning styles in educational systems (Liao, 1999). Students usually have learning difficulty when they learn or study. Learning difficulty has been found by researchers to be one of the causes of under achievement in learning (Nwoji, 2002). Because of that, they need something that can help in scaffolding the knowledge. Scaffolding is a strategy used to support a student in accomplishing a task that he/she cannot complete on his/her own, often by providing prompts, clues, cues, and hints (Barzilai & Blau, 2014). Instructional scaffolds can be used to help students achieve goals that are above their ability to work alone by having them focus on elements of an activity that they can master, and guiding them through more difficult tasks (Schunk, 2008). The main strategy that was used during the augmentation is a processing model (Hill & Hannafin, 2001).

Scaffolding is based on Vygotsky's socio-cultural theory known as the Zone of Proximal Development (ZPD) (Vygotsky, 1978). When supported in the ZPD, by a knowing other, students can receive assistance from peers, instructors, and tools to develop understanding or a skill (McNeill et al., 2000). The term "scaffold" associated with other direct human interaction was first introduced by Wood, Bruner, and Ross (1976) who described a scaffold as a "*process that enables a child or novice to solve a problem, carry out a task, or achieve a goal which would be beyond his unassisted efforts*." In other words, a scaffold is a strategy that is used to support a student in accomplishing a task that s/he cannot complete on his/her own by providing prompts, clues, cues, tools, resources, and hints (Yussof & Zaman, 2011). Scaffolds are added based on students' needs, to help them with the aid of a teacher or tool, and/or to attain a skill that is just out of reach. The scaffolds are then modified according to a students' progress. Afterwards the scaffolds should be faded and removed once a learner becomes independent with the skill (Sawyer, 2006).

Scaffolding can be provided by a teacher to guide and support a student in a personalized learning environment. A key aspect of scaffolding is that this support is gradually faded as a student becomes more independent with the target skill (Van de Pol, Volman, & Beishuizen, 2010; Yussof & Zaman, 2011).

Journal of Personalized Learning, *2*(1) 2016, 95-103.

Scaffolding has also been conceptualized to include not only an adult or lecturer, but also peers, tools, technology, cues, and prompts (Devolder, van Braak, & Tondeur, 2012). Students must internalize these supports, in order for them to be able to independently perform at "…a higher cognitive level" (Salomon, Globerson, & Guterman, 1989).

PROBLEM STATEMENT

Augmented reality has not been widely known in the field of Arabic teaching and learning. The studies of AR environments can be used with either workbooks or flashcards and they can be used in many different field of studies. The main advantages for AR are: learning gains, motivation, interaction and collaboration. (Bacca et al., 2014). A few studies have been done using mobile device to scaffold personalized learning (Huang, Wu & Chen, 2012). Therefore, the mobile AR also can be used in the Arabic teaching and learning with the use of the flashcards. There are many advantages but there are also challenges when designing and using AR applications for personalized Arabic vocabulary teaching and learning. Some of them will be pointed out. Augmented reality (AR) as suggested by Bujak et al. (2013) is just starting to scratch the surface in educational applications. An augmented reality browser is an application that displays geo-located multimedia content using a virtual representation augmented on the vision of the real world (Grubert, Langlotz, & Grasset, 2011).

The Aurasma was introduced in order to support the personalized learning of a specific topic (Chang et al., 2014). Aurasma is a marker-less (image-based) augmented reality browser developed by the United Kingdom-based company in 2011 (Aurasma, 2013). Aurasma allows the user to create augmented reality using their mobile application. To create augmented contents, the user must downloaded Aurasma from Google play or App Store. Aurasma used image and object recognition to link content (Auras). An image is used to trigger the aura once a channel is followed, and trigger images can be used to access additional images, videos, 3-D displays, or links. This augmented reality browser used channels to access the auras created. Then, the auras are saved to library to share via twitter and facebook to be ready for viewing.

Augmented reality has been identified to support personalized learning and has been used fully by students and lecturers in USIM. Personalized learning is an active learning process focusing on the students. The findings of the previous studies indicate that the overall achievement of the students increased after following their personal learning styles and formats (Larkin-Hein & Budny, 2000). Through personalized learning the students are able to access a unique learning experience based on their needs. Therefore, the needs of the students have to be flexible and prioritized so that the students are able to manage how, what, when, and where they have to study. Personalized learning has a big potential to be used by the Arabic lecturers in Higher Education Institutions (HEI) with the advancement of ICT and digital content development tools. According to Mohd et al. (2013), the integration of technology in teaching and learning contributes towards the success of the implementation of personalized learning environment. Therefore, opting for a suitable technology may improve the quality of teaching and learning and achieve the meaningful learning sought by the students.

From the interviews conducted with the lecturers and the students from Arabic Programme in USIM, the researchers found that most of the students have difficulties in memorizing the basic Arabic vocabulary. Thus this study will explain the steps and procedures to develop personalized AR enhanced flashcards using AR application in order to help in scaffolding the knowledge and memorization of the students.

RESEARCH QUESTIONS

The research objectives of the study are as follows:

1- To explore the steps and procedures in developing personalized enhanced flashcards using AR application in order to help in scaffolding the memorization and retention of the students.
2- To investigate satisfaction level of students in using personalized enhanced AR flashcards in their vocabulary learning.

MATERIALS AND METHODS

During the first phase of this study in 2015, 24 elementary-level students were guided by their teacher through a typical reading session in a small group for approximately 45 minutes. The instructor typically introduced basic Arabic vocabulary within the text to students before students were divided into small

Journal of Personalized Learning, *2*(1) 2016, 95-103.

groups. Later the group members were requested to pair the words with their own words and or personal experiences. Because of the wide range of reading abilities in the class, students worked in small groups and individual instruction was also provided with several personalized instruction techniques as shown in Figure 1.

Figure 1. Personalized instruction techniques

The development AR enhanced flashcards process starts with "Augmenting the content". The first step is to take a picture of one image on each page of the textbook: this was the trigger image. A trigger image must have salient features that distinguish it from other images that may be found in the book. A picture of the image in the textbook was taken with an iPad2 device. Once each image was taken, the image was uploaded to iPad 2 and named accordingly (eg., PARAV1 for Personalized Augmented Reality Arabic Vocabulary 1).

Next the researchers logged into Aurasma and uploaded the trigger images in JPEG format to the channel Personalized Augmented Reality Arabic Vocabulary (PARAV). Once all trigger images were added to the PARAV channel, the researcher will create an invisible overlay. When this overlay was started, it was automatically linked to video content created from iPad 2 device. After each trigger image had an overlay associated with it, the researcher created an aura, which tied all the pieces together to create the augmented content. When the channel was followed, the images in the AR enhanced flashcards were ready to be scanned. Figure 2 displays the overall process of how the augmented content was created to augment each flashcard for the students.

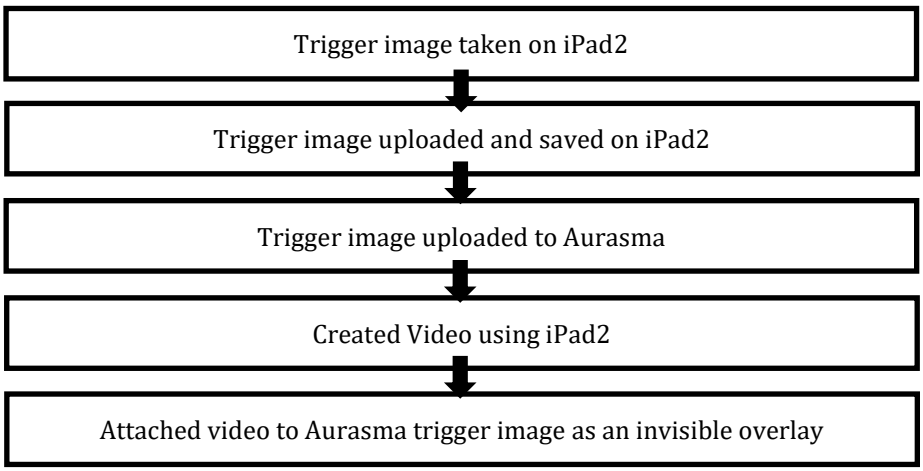

Figure 2. Process of how augmented content was created

Journal of Personalized Learning, *2*(1) 2016, 95-103.

To access this augmented content, students would scan the trigger image (printed on the flashcard) with their iPad 2 device. By scanning an image with the iPad 2 device, the Aurasma application recognized the trigger image and linked to iPad 2 specified link. The video content on the iPad 2 storage was used to expand upon the reading passage and associated Arabic vocabulary. Combined, these tools enriched the students' reading experience by providing them with explanations of the vocabulary words displayed through video, text, audio, and image supports. In order to investigate satisfaction level of students in using personalized enhanced AR flashcards in their vocabulary learning, an adapted survey from Majid et al. (2015) was conducted among the learners. Figure 3 to 6 are the capture taken from the augmented reality enhanced flashcards for Arabic vocabulary learning development process.

Figure 3. List of the selected Arabic vocabulary (Title: things in the class)

Figure 4. Trigger image was taken

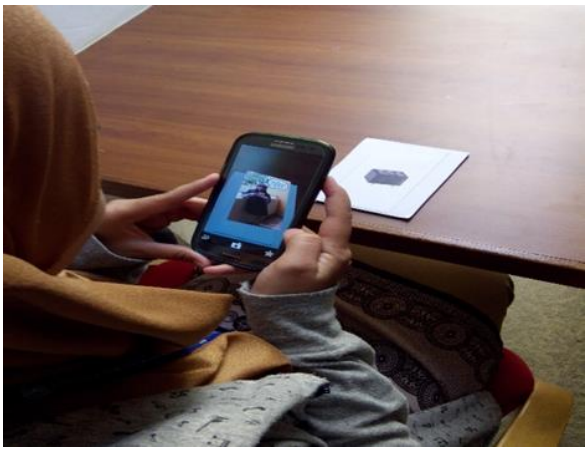

Figure 5. Attach the video to Aurasma trigger image

Journal of Personalized Learning, *2*(1) 2016, 95-103.

Figure 6. Students scan the trigger image

The final step is the evaluation phase where each student will fill out the questionnaire to determine the level of satisfaction of using the developed AR enhanced flashcards for personalized Arabic vocabulary learning. Questionnaire used in the form of five point scale adapted from Martin-Gutierrez et al. (2010).

FINDINGS AND DISCUSSIONS

Descriptive statistical analysis was carried out to identify the satisfaction level of using the developed AR enhanced flashcards for personalized Arabic vocabulary learning. The mean and the frequency, scale of 4 to 5, were calculated to identify the level of student satisfaction for using the application as shown in Table 1.

Table 1. Frequency (scale 4 to 5) for the satisfaction of using AR enhanced flashcards

Item	Satisfaction	Mean
1	I am motivated to use AR enhanced flashcards in learning Arabic vocabulary	4.38
2	AR technology is attractive to use in learning	4.29
3	Do you think the use of AR enhanced flashcards can improve spatial skills?	4.33
4	AR technology is attractive	4.54
5	AR technology seems original	4.46
6	AR technology seems useful	4.16
7	AR technology seems satisfactory	3.92
8	AR technology seems flexible (you can do the training either at university or in your room)	4.08

It can be seem from Table 1 that item 4 has the highest level of satisfaction with mean 4.54. While item 7 has the lowest level with a mean value of 3.92. The overall mean for each of the attributes are in the range of 3.92 to 4.54. This indicates that the respondents were satisfied with the use of the AR enhanced flashcards for personalized Arabic vocabulary learning.

The researchers also would like to highlight three responses of students who support item 4 are as follows:

"AR enhanced flashcards allows content to be more interesting for students to learn Arabic vocabulary and students are more attentive when learning"

"This application can be used as a learning to attract beginner students like me. Furthermore we can use these flashcards while finishing the task at home"

"I think AR flashcards method really meet our needs, because in practice, we can learn and revise the new vocabularies at our own pace"

These positive responses are similar to other studies that employed AR applications in teaching and learning process such as the use of AR-Dehaes that also received a positive response from the students (Martin-Gutierrez et al., 2010). During the implementation of AR Enhanced Flashcards in teaching Arabic Vocabulary, students enjoyed, interested and active in discussions to complete the tasks. Fig. 7 shows the situation where each students in the group actively gives their opinion in completing the tasks at their own pace. AR enhanced flashcards appear to increase student motivation and interest where some students want to practice using AR enhanced flashcards in the future as shown below:

"Need a lot of tasks that use AR enhanced flashcards for every students"

"Do more exercises in class with proper supervision from lecturers"

Journal of Personalized Learning, *2*(1) 2016, 95-103.

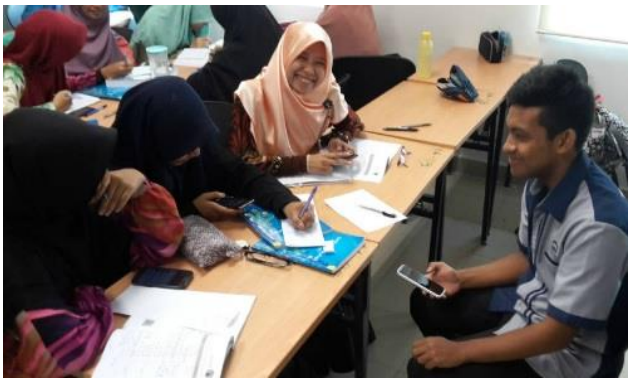

Figure 7. Students discuss actively to complete the task using AR enhanced flashcards

In term of flexibility, there were some students who did not agree with item 8 which is AR enhanced flashcards seems flexible. This may be due to some students who did not have a smart phone or tablet that support AR functions. AR application requires Android platform 4.0 and above. Feedback from student on the use of devices is:

"Must have affordable device in order to finish the assignment and presentations"

For item 7, AR technology seems satisfactory, had the lowest mean score, 3.92. Perhaps this happens because of some limitations of the developed AR enhanced flashcards. The comments are:

"Learning using AR can be improved by clear and better audio, sharp visuals and explanation"
"Better sound or voice, clear image and video"

Low mean score also related to the use of an image as a marker, not a real object. Azuma et al. (2001) claimed that digital information in the form of 2D can be beneficial for collaborative activities, by allowing the spread of information in the physical world. Thus, further study uses real 3D objects as a marker would be very interesting because this new technology allows us to manipulate real objects as the learning objects.

Learning Arabic vocabulary using AR enhanced flashcards can bring the elements of excitement and stimulation to increase the desire and motivation in the students in learning the language. Further, with more and more opportunities to work with new and developing technologies as information professionals, USIM wanted to explore the potential for integrating these technologies with personalized and customized Arabic language teaching process, and then to share our challenges and experiences with others in order to help them to address similar issues in their university. AR enhanced flashcards offer some potential solutions for learning obstacles as to help in scaffolding the knowledge of students regarding the Arabic vocabulary learning, so that students can enhance their achievement in learning Arabic as it promotes several aspects of personalized learning:

Student Autonomy
The students are able to make choices about what they are learning in the Arabic class with the intention of boosting their engagement and motivation. Allowing students to decide how to approach the tasks given does have a positive effect on student motivation. Students should be methodically encouraged to ask themselves why they have chosen this or that learning materials, or performed this or that activity, and indicate to themselves how their choice relates to their interests, preferences and identity as a whole.

Flexible Learning Environment
Integrating modern technology like augmented reality is another way to enhance flexibility and adaptiveness of the Arabic learning environment. Now students can use AR enhanced flashcard at different places in and outside their class at their own pace.

Personal Learning Path
Students can self-assess their individual Arabic learning strengths and weaknesses, or reflect on what they have academically achieved, excelled at, or struggled with in the past. Students also can choose materials to use in class projects and the way competence will be demonstrated. Ideally, students must be provided with

the process, supports, and technology to support independent goal-setting that can be measured and tracked over time.

Given the flexibility of AR enhanced flashcard, it can be implemented in many ways with differing levels of openness and choice and in various Arabic learning environments. The need to work more effectively and efficiently in personalized Arabic language teaching has always been a goal for USIM, but in the current economic climate, this aim is becoming increasingly more important. Now students are able set personal academic and non-academic goals, track progress against those goals, and reflect on strengths and areas for growth. Students' learning experiences (what they learn, and how, when, and where they learn it) are tailored to their individual needs, skills, and interests, and enable them to take ownership of their learning. Although where, when, and how they learn might vary according to their needs, students also develop deep connections to each other and their lecturers. A blended approach to deliver Arabic language lessons, via a programme of face-to-face teaching combined with personalized online elements, can prove a useful and effective way of reaching students, and of providing a 'just-in-time' form of support. Ideally, this AR element should provide an engaging, varied personalized learning environment with a mixture of audio, visual or multimedia content.

CONCLUSION

This paper reports on the efforts of exploring the potential use of AR enhanced flashcards and scaffolding a conceptual support for personalized Arabic vocabulary learning among learners in USIM. Although the sampling is small, but the initial findings are important in presenting the potential use of augmented reality application in a personalized learning platform in order to help them in the memorization and retention of Arabic vocabulary theoretically and practically. By exploring this AP application surely will help in improving the effectiveness of Arabic language teaching and learning in the future.

Acknowledgement

The authors would like to thank the Global Open Access Learning, Immersive Technology and Quality Assurance (GOAL ITQAN), Universiti Sains Islam Malaysia for its support and assistance during the period of data collection in this study

References

Aurasma (2013). About us. Retrieved February 13, 2013 from: http: //www.aurasma.com/about-us/.

Azuma, R., Baillot, Y., Behringer, R., Feiner, S., Julier, S., & MacIntyre, B. (2001). Recent advances in augmented reality. *Computer Graphics and Applications, IEEE, 21(6), 34-47.*

Bacca, J., Baldiris, S., Fabregat, R., Graf, S., & Kinshuk. (2014). Augmented Reality trends in education: A systematic review of research and applications. *Educational Technology & Society, 17 (4), 133–149.*

Barzilai, S., & Blau, I. (2014). Scaffolding game-based learning: Impact on learning achievements, perceived learning, and game experiences. *Computers & Education, 70, 65-79.*

Bujak, K. R., Radu, I., Catrambone, R., MacIntyre, B., Zheng, R., & Golubski, G. (2013). A psychological perspective on augmented reality in the mathematics classroom. *Computers & Education*, *68*, 536–544. doi:10.1016/j.compedu.2013.02.017

Chang, K.-E., Chang, C.-T., Hou, H.-T., Sung, Y.-T., Chao, H.-L., & Lee, C.-M. (2014). Development and behavioral pattern analysis of a mobile guide system with augmented reality for painting appreciation instruction in an art museum. *Computers & Education, 71, 185–197. doi:10.1016/j.compedu.2013.09.022*

Dede, Christopher, Edward Dieterle, Jody Clarke, Diane Jass Ketelhut, and Brian Nelson. (2007). Media-based learning styles: Implications for distance education. *In Handbook of distance education*, edited by M. Moore. Mahwah, NJ: Lawrence Erlbaum Associates.

Devolder, A., van Braak, J., & Tondeur, J. (2012). Supporting self-regulated learning in computer-based learning environments: systematic review of effects of scaffolding in the domain of science education. *Journal of Computer Assisted Learning*, *28*(6) 557-573.

Grubert, J., Langlotz, T., & Grasset, R. (2011). *Augmented reality browser survey. Institute for computer graphics and vision*. Technical report, University of Technology Graz.

Hill, J. R., & Hannafin, M. J. (2001). Teaching and learning in digital environments: The resurgence of resource-based learning. *Educational Technology Research and Development, 49(3) 37-52.*

Huang, H. W., Wu, C. W., & Chen, N. S. (2012). The effectiveness of using procedural scaffoldings in a paper-plus-smartphone collaborative learning context. *Computers & Education, 59(2) 250-259.*

Ismail, Z. (2008). Penilaian pelaksanaan kurikulum kemahiran bertutur bahasa Arab komunikasi di Sekolah Menengah Kebangsaan Agama.(Evaluation of implemented curriculum of speaking skill in Arabic communicative subjects in religious secondary schools). *Evaluation of implemented curriculum of speaking skill in Arabic communicative subjects in religious secondary schools*.

Johnson, L., Adams Becker, S., Estrada, V., & Freeman, A. (2014). *Horizon report 2014 - Higher education edition*. Austin, TX: The New Media Consortium.

Larkin-Hein, T. & Budny, D. D. (2000). *Why bother learning about learning styles and psychological types?* Proceedings of the 2000 ASEE Annual Conference and Exposition. Retrieved from http://nw08.american.edu/~tlarkin/pdf_files/Session3280P&EP.PDF

Liao, Y.C. (1999). Effects of hypermedia on students' achievement: A meta-analysis. *Journal of Educational Multimedia and Hypermedia,8(3), 255-277.*

Majid, N.A, Mohammed, H. and Sulaiman R. (2015). Students' perception of mobile augmented reality applications in learning computer organization. *Procedia-Social and Behavioral Sciences, 176, 111-116.*

Martín-Gutiérrez, J., Saorín, J. L., Contero, M., Alcañiz, M., Pérez-López, D. C., & Ortega, M. (2010). Design and validation of an augmented book for spatial abilities development in engineering students. *Computers & Graphics, 34(1), 77-91.*

McNeill, K. L., Lizotte, D. J., Krajcik, J., & Marx, R. W. (2006). Supporting students' construction of scientific explanations by fading scaffolds in instructional materials. *The Journal of the Learning Sciences, 15*(2), 153-191.

Mohd, C. K. N. C. K., Shahbodin, F., & Pee, A. N. C. (2013). Personalized learning environment (PLE) approach: Preliminary analysis in Malaysian's secondary school. *International Journal of Computer and Information Technology, 2(3), 412-416.*

National Research Council. (2000) *How people learn: Brain, mind, experience, and school: Expanded edition*. Washington, DC: The National Academies Press.

Nitko, A. J., & Nwoji, I H (2002). *Difficulties encountered by senior secondary chemistry students in the understanding of the mole concept*. (Unpublished M.Ed thesis), University of Nigeria Nsukka.

Radu, I. (2014). Augmented reality in education: a meta-review and cross-media analysis. *Personal and Ubiquitous Computing, 18(6), 1–11. doi:10.1007/s00779-013-0747-y*

Salomon, G., Globerson, T., & Guterman, E. (1989). The computer as a zone of proximal development: Internalizing reading-related metacognitions from a reading partner. *Journal of Educational Psychology*, *81*(4) 620.

Sawyer, R. K. (Ed.). (2006). *The Cambridge handbook of the learning sciences.* New York: Cambridge University Press.

Schunk, D.H. (2008). *Learning theories: An educational perspective*. (5th edition). New York: Prentice Hall.

Smith, H., Luckin, R., Fraser, D. S., Williams, L., Dünser, A., Hornecker, E., Woolard, A. & Lancaster, B. (2007). *Sun seeking: Interactive story-reading through different media*. In Proceedings of the 2007 conference on artificial intelligence in education: Building technology rich Learning contexts that work, (647-649).

Van de Pol, J., Volman, M., & Beishuizen, J. (2010). Scaffolding in teacher–student interaction: A decade of research. *Educational Psychology Review*, *22*(3) 271-296.

Vygotsky, L. (1978). Interaction between learning and development. In M. Gauvain & M. Cole (Eds.). *Readings on the development of children*, (pp. 34-41).Cambridge: The Harvard University Press.

Wood, D., Bruner, J. S., & Ross, G. (1976). The role of tutoring in problem solving. *Journal of Child Psychology and Psychiatry*, *17*(2) 89-100.

Yussof, R. L., & Zaman, H. B. (2011). *Scaffolding in early reading activities for down syndrome. In Visual informatics: sustaining research and innovation*. (pp. 180-192). Springer Berlin Heidelberg.

Zainuddin, N., Sahrir, M. S., & Nasir, M. S. (2015). Taqwim Barnamij'Arabiyyatiyy Fi Iksab Mufradat al-Lughat al-'Arabiyyah Lada al-Darisin al-Natiqin Bi Ghayriha. *Al-Qanatir International Journal of Islamic Studies*, *2*(2).

Zainuddin, N., & Sahrir, M. S. (2016). Multimedia Courseware for Teaching Arabic Vocabulary: Let's Learn from the Experts. *Universal Journal of Educational Research*, *4*(5), 1167-1172.