

# A Conceptual Framework for DoCtor WoRM's Module in Improving Multiplication Skills among Year Four Low Achievers

Yoong Soo May, Noor Aini Ahmad

To Link this Article: <http://dx.doi.org/10.6007/IJARBSS/v8-i4/4123>

DOI:10.6007/IJARBSS/v8-i4/4123

*Received: 22 March 2018, Revised: 19 April 2018, Accepted: 21 April 2018*

Published Online: 23 April 2018

**In-Text Citation:** (May & Ahmad, 2018)

**To Cite this Article:** May, Y. S., & Ahmad, N. A. (2018). A Conceptual Framework for DoCtor WoRM's Module in Improving Multiplication Skills among Year Four Low Achievers. *International Journal of Academic Research in Business and Social Sciences*, 8(4), 924–934.

**Copyright:** © 2018 The Author(s)

Published by Human Resource Management Academic Research Society ([www.hrmars.com](http://www.hrmars.com))

This article is published under the Creative Commons Attribution (CC BY 4.0) license. Anyone may reproduce, distribute, translate and create derivative works of this article (for both commercial and non-commercial purposes), subject to full attribution to the original publication and authors. The full terms of this license may be seen at: <http://creativecommons.org/licences/by/4.0/legalcode>

**Vol. 8, No. 4, April 2018, Pg. 924 - 934**

<http://hrmars.com/index.php/pages/detail/IJARBSS>

**JOURNAL HOMEPAGE**

Full Terms & Conditions of access and use can be found at  
<http://hrmars.com/index.php/pages/detail/publication-ethics>

## **A Conceptual Framework for DoCtor WoRM's Module in Improving Multiplication Skills among Year Four Low Achievers**

Yoong Soo May, Noor Aini Ahmad

Department of Special Education, Faculty of Human Development, Universiti Pendidikan Sultan Idris, Malaysia.

### **Abstract**

Multiplication is one of the basic arithmetic skills for every pupil who learns Mathematics. Nevertheless, it had become a challenging task for pupils when they still unable to master the skills even by Year Four. The study designed a module entitled DoCtor WoRM's Module based on game-based learning and mastery learning. This paper presented the literature review on remedial education, mastery learning, game-based learning, Mathematics as a subject, multiplication, and low achievers. The purpose of this study is to design a conceptual framework for DoCtor WoRM's Module in order to improve multiplication skills among Year Four low achievers. Based on the conceptual framework, two phases in this study are Module Development Phase and Module Evaluation Phase. During the first phase, DoCtor WoRM's Module is developed based on the digital game-based learning (Prensky, 2001) and mastery learning (Bruner, 1971). Five important steps in DoCtor WoRM's Module are drawing, counting, writing, reading, and memorizing. This study is quasi-experimental design in nature. Hence, the researcher will divide the pupils into control group and experimental group. The experimental group will be undergone teaching and learning using DoCtor WoRM's Module. After the implementation of the module, the pupils are expected to master in single-digit multiplication.

**Keywords:** Multiplication, Mathematics, Low Achievers, Module

### **Introduction**

The first shift in Malaysia Education Blueprint (PPPM) 2013 - 2025 is providing an equal access to quality education of an international standard. In this case, government had increased the investment in physical and teaching resources for pupils with specific needs. A conducive and supportive learning environment is created by being provided with facilities and equipment needed. Besides, these pupils would be also taught by teachers who have received additional training to help them understand their pupils' specific contexts and challenges, and the teaching strategies required to address them (Malaysia Education Blueprint, 2012).

Mathematics is the foundation of Science, technology, and intellectual development. It is also an index of civilization evolution (Chang & Yang, 2016). Mathematics is the abstract study of topics such as quantity, numbers, structure, space, and change. Through the use of abstraction and logic, Mathematics developed from counting, calculation, measurement, the systematic study of the shapes, and motions of physical objects (Ziegler, & Loos, 2014).

In this study, a conceptual framework on DoCtor WoRM's Module is recommended to solve the difficulties among Year Four low achievers. As a conclusion, DoCtor WoRM's Module is designed to improve the achievements of Year Four low achievers in multiplication skills.

### **Literature Review**

The literature review includes remedial education, mastery learning, game-based learning, Mathematics as a subject, multiplication, and low achievers.

### **Remedial Education**

Taiwan Ministry of Education (MOE 2015) has drafted guidelines for remedial education policy. Under this policy, low achievers are defined as elementary and junior high school pupils whose achievement scores of Chinese, English, and Mathematics are at or below 25th percentile in their school (Chen & Yu, 2016). Remedial education at an early stage can provide useful insights into the opportunities of the pupils in Mathematics (Toll, & Van Luit, 2013). The pupils with a language deficiency remedial education may affect their early numeracy development. These pupils were not able to generalize the skills that they have learnt into more advance mathematical skills, such as basic calculation fluency (Van Luit & Toll, 2014). In community college, remedial-Mathematics workshop has been proven to be an effective tool in helping the pupils to complete their basic Mathematics requirements (Dabkowska & Sosnovski, 2016).

On the other hand, there are also some colleges and universities had planned and formulated multiple policies and measures to develop online remedial instruction programs (Lin, Wu & Hsueh, 2014). Remedial Mathematics in higher education needs to be improved continuously (Bahr, 2013). The remedial instruction materials provided personalized assistance based on the pupils' errors and provided them with more effective and convenient tools to learn (Hsiao, Yang, Wei, Chang & Lan, 2016).

In summary, remedial education is very important to every stages of learning, begin with kindergarten until high education. For low achievers, remedial education may improve their learning and draw them to the similar level with the other pupils. In Malaysia, remedial education is not classified as Special Education. However, the pupils under remedial education are considered in special needs. Hence, this study will focus on remedial education for low achievers in order to improve their Mathematics achievement.

### **Mastery Learning**

In Mastery Learning, the pupils are allowed to take their time to achieve the learning goals. The learning content would be broken down into several small learning units, and only the pupils acquire the prerequisite knowledge or skills can move to the next learning unit (Lin et al., 2013).

Learning for Mastery (LFM) based on Benjamin Bloom's interpretations and adaptations of John Carroll's model of school learning, in which initial instruction is provided through a variety of methods to the whole class. Individualized instruction is provided as needed and followed by a mastery test (Gentile & Lalley, 2003).

Mastery learning is an innovative method providing the opportunity to all the pupils with a plenty of time to learn Mathematics subject based on their ability and capability. So, the pupils can learn a topic in a particular Mathematics course according to their own pace (Shafie, Shahdan & Liew, 2010). Content areas that have using mastery learning approach the most are reading and Mathematics because these skills are sequential and build on one another (Holt & Kysilka, 2006). The pupils can reach automatized mastery of basic multiplication facts with plenty of practice (Kroesbergen, Van Luit & Maas, 2004).

In short, mastery learning is a method which breaks the learning into smaller units so that the pupils are able to master the skills according to their own pace. It is an approach suitable to low achievers in Mathematics subject. Hence, the researcher will implement mastery learning in designing DoCtor WoRM's Module, in which the pupils need to master one multiplication fact before they can proceed to the next multiplication facts.

### **Game-Based Learning**

Games are relevant to young pupils as they are children's world. Games offer a unique structure to complement traditional teaching strategies and infuse teaching with energy, spark innovative thinking, and provide diversity in teaching methods (Boyle, 2011). Games can also continuously keep players within their zone of proximal development and engaged in learning. Besides, games help pupils who tend to get bored or overwhelmed with traditional instruction active and motivated in the learning process (Hamari, Shernoff & Rowe, 2015). Instead of just creating games for pupils to play, game-based learning is actually designing learning activities that can incrementally introduce concepts, and guide the players towards an end goal (Pho & Dinscore, 2015).

Digital game-based learning is the expression of connecting the teaching process to the new learning technologies, the computer or other electronic devices, such as iPod, iPhone, console, smart board, and platform (Cojocariu & Boghian, 2014). In twenty first century, digital game-based learning has become a form of new teaching and learning activity. However, it has not been practiced in the formal education system in Malaysia (Hussain, Tan, & Idris, 2014). Game-based learning is a form of new media that are attractive to young children (Chuang & Tsai, 2015).

Digital learning games are considered as an entertainment medium designed to bring about cognitive changes in the players (Erhel & Jamet, 2013). Digital game-based learning works primarily for three reasons: engagement, interactive learning process, and putting together the two reasons in a whole package (Prensky, 2007). The games are able to engage and motivate players. They also provide experiences that the players enjoy and want to continue (Plass, Homer & Kinzer, 2015).

Since game has become an effective way to improve learning, especially for children who love to play in nature, so the researcher decided to implement game-based learning in the intervention of DoCtor WoRM's Module. Besides having fun, the pupils are expected to build their knowledge and skills from the interactive game. This interactive game will act as reinforcement in the lesson for the pupils to understand the steps to solve multiplication and to complete some activities for single-digit multiplication facts.

### **Mathematics as a Subject**

In Malaysia, Mathematics is one of the main subjects taught in all primary schools (Hussain et al., 2014). Mathematics provides opportunities to build tool and component skills that enable performance on composite skills (Johnson, & Street, 2013). Declines in Mathematics enrolments at high school are worldwide and extend beyond cultural and national borders. Educator must develop strategies that are underpinned by theories in order. This is to overcome the challenges imposed by the global declines in numeracy skills (Everingham, Gyuris, & Connolly, 2017).

A main goal of Mathematics education in this age of uncertainty must be to convincing the pupils that they can learn Mathematics, in the hope that they will continue to learn. This is to ensure that they are able to adapt to the mathematical challenges with which their future lives will present them (Sullivan, 2011). Basic operations in Mathematics, such as addition, subtraction, multiplication, and division are all facts that can be taught using mastery learning (Holt, & Kysilka, 2006). The educators can develop the teaching of Mathematics through a continuing and collaborative inquiry of teaching practices (Lin, & Acosta-Tello, 2017). Teaching Mathematics is a challenge at all grade levels, but technology has some specific attributes that support the learning of Mathematics in new and exciting ways (Schrum, & Levin, 2015).

The lack of interest in Mathematics occurs in group of low achievers. Interest of pupils in Mathematics is determined by the way in which the teaching, learning and assessment of mathematical knowledge are carried out (Voinea, & Purcaru, 2013). The findings of the researches show that, even though Mathematics is a very important subject for a pupil, but some may face difficulties in learning it. This also happens among Mathematics low achievers, which have lack of interest in this subject. A good method or technique need to be developed because it can stimulate the thought or cognitive of pupils to understand the basic mathematical concepts (Ahmat, Mohamed, Azmee, & Adham, 2017).

In conclusion, Mathematics is one the most important subjects yet some pupils might face difficulties in learning it. This matter is crucial among the Mathematics low achievers. The educators need to be creative in designing or applying the good methods and techniques while teaching the pupils. Otherwise, these pupils might be left out in academic and face some challenges to solve daily life problems. So, the researcher has decided to design a module for Year Four achievers in order help them to master the basic mathematical skills and to improve their Mathematics achievements.



## **Multiplication**

Arithmetic facts, in particular multiplication tables are usually organized in an interrelated network in long-term memory. This allows learners to quickly retrieve the answers to simple multiplication problems such as  $3 \times 4$  (Visscher, Noel, & Smedt, 2016). Single-digit multiplication mental calculation is very important. In most countries, pupils learn multiplication by memorizing the multiplication tables (ven der Ven, Straatemeier, Jansen, Klinkenberg, & van der Maas, 2015). Regarding to this, the research also shows that low achievers must rely on other strategies to solve multiplication problems, until they have attained full automaticity (Kroesbergen, Van Luit, & Maas, 2004).

Chinese fourth and fifth grade pupils were likely to treat multiplication facts as language-based tasks because they had received systematic instruction of multiplication through their Mathematics curriculum. Over practice and emphasis on drills in Chinese Mathematics curriculum might train these children to rely more on phonological codes for retrieval (Liu, Ding, Xu, & Wang, 2016). Subsequently, pupils view the multiplication algorithms primarily as rules to be followed. They also view the numbers involved as separate digits and not grouped amounts that involving place-values. In many cases, the result is an incorrect answer. This is because the pupils are lack of understanding in estimation, place value, and reasonableness of results (Bergeson, Fitton, Bylsma, Neitzel, & Stine, 2000).

Hence, multiplication as one of the basic operational skills must be mastered by the pupils. However, the low achievers may not be able to acquire this skill as planned in the syllabus due to the different level of verbal working memory. These pupils may even face problems in solving single-digit multiplication and memorizing multiplication tables. Hence, this study will focus on single-digit multiplication, and the targeted participants will be the Year Four low achievers.

## **Low Achievers**

Low achievers are the pupils who are slower to make academic achievement as their peers. They are the pupils who face difficulty in meeting educational standards. These pupils usually do not qualify for special education services, regular educational teachers are held primarily responsible for their education (VanAuker-Ergle, 2003). The low achievers are a special group of non-disabilities children who have difficulties to acquire fundamental knowledge during learning process in class (Ahmad, & Mutalib, 2016). Mathematics low achievers may concentrate more on basic procedures instead of general concepts (Madamurk, Kikas, & Palu, 2016).

Even though low achievers are physically perfect, these pupils are currently undergone some internal problems which are difficult to be detected. They also have a relatively low educational background and do not meet the basic needs (Nor, & Abdullah, 2009). In this case, the pupils who do not achieve early school success are thought to gradually withdraw from active participation in school activities. Over time, these pupils have weak identification with school. Subsequently, it affects their academic self-esteem and self-concept, erodes the relationships with their peers, and eventually reduces their opportunities of completing high school (Lawson, & Lawson, 2013).

In Malaysia, most parents, teachers, and school administrators give a main concern in pupils' academic achievement. This happened especially for those who are involved with educating the low achievers whose numbers are on the rise (Ishak, Yunus, Rahman, & Mahmud, 2010). However, the basic comprehension of Mathematics skills among the low achievers in school were seldom recognized, so these low achievers continue to develop negative attitude towards subject of Mathematics (Davrajoo, Tarmizi, Nawawi, & Hassan, 2010).

In conclusion, low achievers are pupils who attain low academic achievement yet they are not qualified for special educational services. These special needs pupils faced problems when they need to learn in the same classroom with the mainstream pupils. In other words, they must be given a proper education suitable with their academic achievement level. Hence, the researcher decided to design a module involving an interactive game based on the needs of these low achievers in order to acquire the basic Mathematics skills.

### **Conceptual Framework**

According to the previous literature, game-based learning and mastery learning are able to enhance Mathematics academic performance among the pupils. The purpose of the survey is to design a conceptual framework to build a module for multiplication skills among Year Four low achievers. There are two phases in this study, which are Module Development Phase and Module Evaluation Phase.

Computer and videogames are potentially the most engaging pastime in the history of mankind. This is due to a combination of twelve elements; (1) games are a form of fun, (2) games are form of play, (3) games have rules, (4) games have goals, (5) games are interactive, (6) games are adaptive, (7) games have outcomes and feedback, (8) games have win states, (9) games have challenge, (10), games have problem solving, (11) games have interaction, and (12) games have representation and story (Prensky, 2001).

Bloom taxonomy is associated with mastery learning, because it is the same Benjamin Bloom who is famous for both. The taxonomy, edited by Bloom, was developed by a committee and published in 1956 to expand teaching and testing beyond the lowest levels of rote learning that were considered to dominate teaching in those day. By 1968, Bloom had launched his version of mastery learning, based on John Carroll's model of school learning (Bloom, 1971 in Gentile & Lalley, 2003).

In mastery learning, teachers set an objective based on pupils' level. The pupils went through learning process so that they can achieve the first objective. Formative assessment is given to the pupils in every lesson. This is to see whether the pupils acquired the knowledge along the intervention taking place. Next, enrichment activity is carried out. If the pupils does not show mastery in the skill, then correction need to be done until the pupils solve at least 80 percent of the items correctly. After the pupils achieved mastery in the unit, then they will proceed to the next unit with the second objective.

The researcher had selected Year Four low achievers using purposive sampling. The researcher had also divided these low achievers into control group and experimental group. The experimental group went through an intervention using DoCtor WoRM's Module. After the intervention, the pupils in the experimental group should be able to master in single-digit multiplication. Figure 1 shows the conceptual framework in this study.

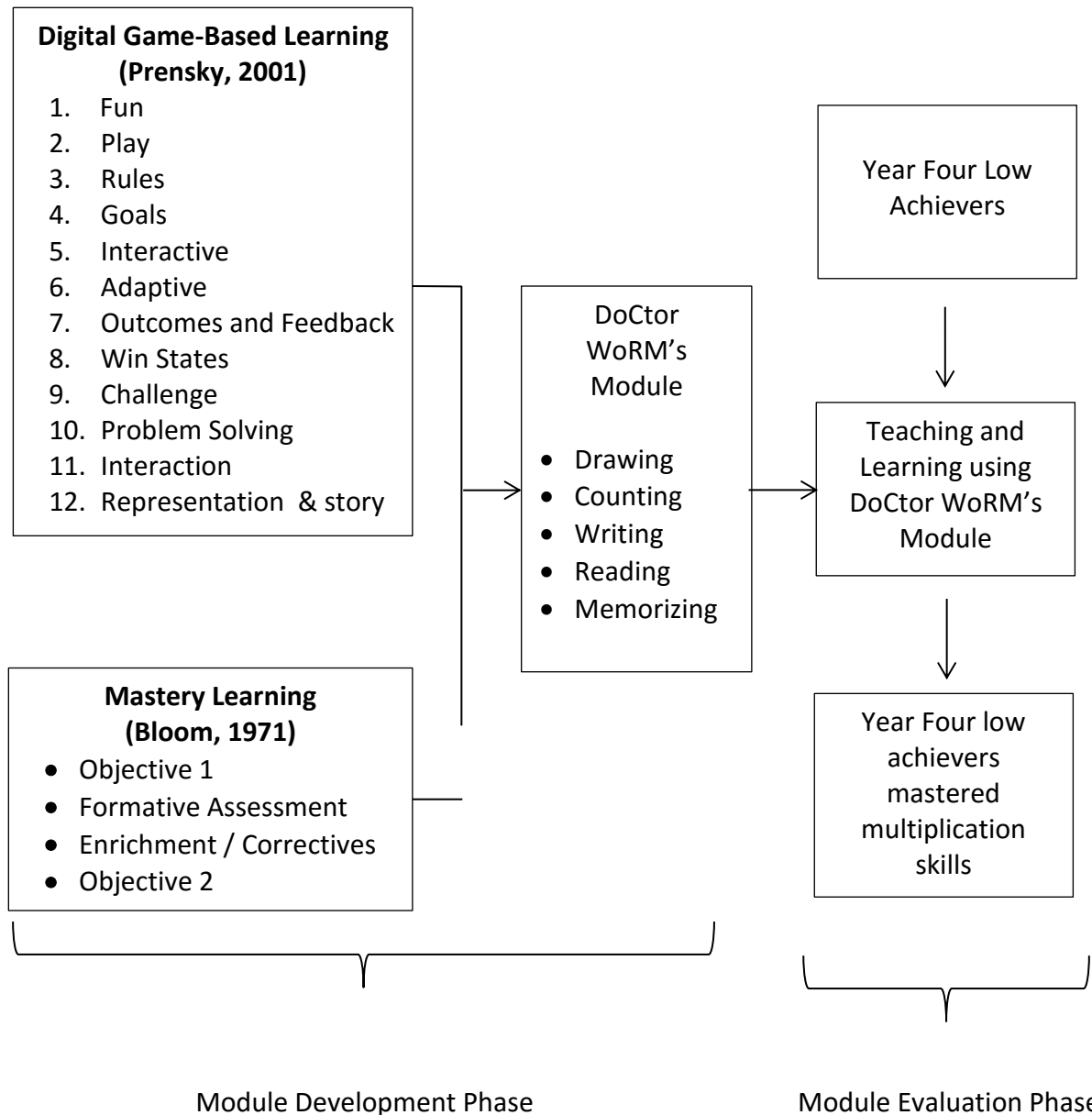


Figure 1 Conceptual Framework

**Conclusion and Discussion**

Literature review had been made on remedial education, mastery learning, game-based learning, Mathematics as a subject, multiplication, and low achievers. In short, remedial education is assigned to low achievers in improving their academic achievement. Game-based learning is



applied as it is in line with the nature of the children. Since Mathematics is a core subject in primary education, the pupils must master in the Mathematics skills, such as multiplication. In order to help the low achievers in improve their learning, the teachers should think of an innovative and creative way for the teaching and learning.

To improve Year Four low achievers in multiplication skills, the researcher had designed a conceptual framework. This framework had divided the study into two phases, which are Module Development Phase and Module Evaluation Phase. During the Module Development Phase, the resesarcher had applied game-based learning (Prensky, 2001) and mastery learning (Bloom, 1971) while constructing the module. DoCtor WoRM's Module implemented five important steps with the abbreviation of /D/ drawing the intersecting lines, /C/ counting the intersection points, /W/ writing the multiplication sentences, /R/ reading the multiplication sentences, and /M/ memorizing the multiplication facts.

On the other hands, the samples in the experimental group will undergo intervention during Module Evaluation Phase. After the intervention, the pupils should be able to master in single-digit multiplication. Hence, the results of this study will depict the effect of DoCtor WoRM's Module in improving the Mathematics achievement of Year Four low achievers.

### **Corresponding Author**

Yoong Soo May

Department of Special Education

Faculty of Human Development

Universiti Pendidikan Sultan Idris

Perak Malaysia.

Email: soomayyoong@gmail.com

### **References**

- Bahr, P. R. (2013). The aftermath of remedial math: Investigating the low rate of certificate completion among remedial math students. *Research in Higher Education*. 54, 171-200.
- Bergeson, T., Fitton, R., Bylsma, P., Neitzel, B., & Stine, M. A. (2000). *Teaching and learning Mathematics: Using research to shift from the "yesterday" mind to the "tomorrow" mind*. Washington: State Superintendent of Public Instruction.
- Boyle, S. (2011). An introduction to game based learning. *UCD Teaching and Learning Resources*. Retrieved from <https://www.ucd.ie/t4cms/UCDTLT0044.pdf>
- Chang, R. C., & Yang, C. Y. (2016). Developing a mobile app for game-based learning in middle school Mathematics course. *Proceedings of the International Conference on Applied System Innovation*. Okinawa Convention Center, Japan. 28 May-1 June 2016.
- Chen, H. L. S., & Yu, P. (2016). Closing achievement gaps and beyond: teacher's reactions to the remedial education policy in taiwan. *Asia Pacific Education Review*. 17, 609-624.
- Chuang, T. Y., & Tsai, C. M. (2015). Forecast the scarcity of game generation: digital game literacy. *New Media and Learning in the 21<sup>st</sup> Century*. 37-65.
- Cojocariu, V. M., & Boghian, I. (2014). Teaching the relevance of game-based learning to preschool and primary teachers. *Procedia-Social and Behavioral Sciences*. 142, 640-646.

- Dabkowska, E., & Sosnovski, B. (2016). Remedial-math workshop: opening doors to graduation. *Community College Journal of Research and Practice*. 40(11), 954-960.
- Davrajoo, E., Tarmizi, R. A., Nawawi, M., & Hassan, A. (2010). Enhancing algebraic conceptual knowledge with aid of module using mastery learning approach. *Procedia Social and Behavioral Science*. 8, 362-369.
- Erhel, S., & Jamet, E. (2013). Digital game-based learning: impact of instructions and feedback on motivation and learning effectiveness. *Computers & Education*. 67, 156-167.
- Everingham, Y. L., Gyuris, E., & Connolly, S. R. (2017). Enhancing student engagement to positively impact mathematics anxiety, confidence and achievement for interdisciplinary science subjects. *International Journal of Mathematical Education in Science and Technology*. 48(8), 1153-1165.
- Gentile, J. R., & Lalley, J. P. (2003). *Standards and mastery learning: aligning teaching and assessment so all children can learn*. California: A Sage Publications Company.
- Hamari, J., Shernoff, D. J., & Rowe, E. (2015). Challenging games help students learn: an empirical study on engagement, flow and immersion in game-based learning. *Computers in Human Behavior*. 54, 170-179.
- Holt, L. C., & Kysilka, M. (2006). *Instructional patterns: strategies for maximizing student learning*. California: Sage Publications, Inc.
- Hsiao, I. Y. T., Yang, S. J. H., Wei, Y. H., Chang, T. L., & Lan, Y. J. (2016). Creating 3D game-based learning system in a virtual world for low-achieving students in mathematics. *Proceedings-IEEE 16<sup>th</sup> International Conference on Advanced Learning Technologies, ICALT 2016*. Institute of Electronics Engineers Inc. 518-519.
- Johnson, K., & Street, E. M. (2013). *Response to Intervention and Precision Teaching*. New York: The Guilford Press.
- Kementerian Pelajaran Malaysia. (2012). *Dasar Pendidikan Kebangsaan*. Selangor: Giga Wise Network Sdn Bhd.
- Kirkley, J. R., Duffy, T. M., Kirkley, S. E., & Kremer, D. L. H. (2011). Implications of Constructivism for the design and use of serious games. *Computer Games and Instruction*. 371-394.
- Kroesbergen, E. H., Van Luit, J. E. H., & Maas, C. M. (2004). Effectiveness of explicit and Constructivist Mathematics instruction for low-achieving students in the Netherlands. *The Elementary School Journal*. 104(3): 233-251.
- Lawson, M. A., & Lawson, H. A. (2013). New conceptual frameworks for student engagement research, policy, and practice. *Review of Educational Research*. 83(3), 432-479.
- Lin, C. H., Liu, E. Z. F., Chen, Y. L., Liou, P. Y., Chang, M., Wu, C. H., & Yuan, S. M. (2013). Game-based remedial instruction in mastery learning for upper-primary school students. *Journal of Educational Technology & Society*. 16(2), 271-281.
- Lin, H. C. K., Wu, C. H., & Hsueh, Y. P. (2014). The influence of using affective tutoring system in accounting remedial instruction on learning performance and usability. *Computers in Human Behavior*. 41, 514-522.
- Lin, P. J., & Acosta-Tello, E. (2017). A practicum mentoring model for supporting prospective elementary teachers in learning to teach mathematics. *ZDM Mathematics Education*. 49, 223-236.
- Liu, R. D., Ding, Y., Xu, L., & Wang, J. (2016). Involvement of working memory in mental multiplication in chinese elementary students. *The Journal of Educational Research*. 110

- (4), 380-390.
- Madamurk, K., Kikas, E., & Palu, A. (2016). Developmental trajectories of calculation and word problem solving from third to fifth grade. *Learning and Individual Differences*. 49, 151-161.
- Nor, M. M., & Abdullah, S. H. (2009). Pendekatan main dalam menangani masalah pembelajaran kanak-kanak. *Diges Pendidik*. 9(2), Penang: Universiti Sains Malaysia.
- Ahmat, N., Mohamed, N. H., Azmee, N. A., & Adham, S. M. (2017). Developing a technique to master multiplication facts 6 to 9 for year 5 pupils. *AIP Conference Proceedings*.
- Ishak, N. M., & Yunus, M. M., Rahman, S. A., & Mahmud, Z. (2010). Effects of FLEP on self-motivation and aspiration to learn among low-achieving students: an experimental study across gender. *Procedia-Social and Behavioral Sciences*. 7, 122-129.
- Pho, A., & Dinscore, A. (2015). Game-based learning. *Tips and Trends*. Spring.
- Plass, J. L., Homer, B. D., & Kinzer, C. K. (2015). Foundations of game-based learning. *Educational Psychologies*. 50(4), 258-283.
- Prensky, M. (2001). *Digital game-based learning*. New York: McGraw-Hill.
- Prensky, M. (2007). *Digital game-based learning*. United States: Paragon House.
- Hussain, S. Y. S., Tan, W. H., & Idris, M. Z. (2014). Digital game-based learning for remedial Mathematics students: a new teaching and learning approach in Malaysia. *International Journal of Multimedia and Ubiquitous Engineering*. 9(11), 325-338.
- Schrum, L., & Levin, B. B. (2015). *Leading 21st century schools: second edition*. United States of America: Corwin, A SAGE Company.
- Ahmad, S. Z., & Mutalib, A. A. (2016). Conceptual model of iCAL4LA: proposing the components using comparative analysis. *AIP Conference Proceedings*. 1761(1).
- Sullivan, P. (2011). *Teaching mathematics: using research-informed strategies*. Camberwell, Victoria: ACER Press.
- Toll, S. W. M., & Van Luit, J. E. H. (2013). Accelerating the early numeracy development of kindergartners with limited working memory skills through remedial education. *Research in Developmental Disabilities*. 34, 745-755.
- VanAuker-Ergle K. A. (2003). *Barriers to low achievers' success in the elementary classroom as perceived by teachers: a qualitative study*. University of Florida.
- Van Luit, J. E. H., & Toll, S. W. M. (2014). Remedial early numeracy education: can children identified as having a language deficiency benefit. *International Journal of Language & Communication Disorders*. 50(5), 593-603.
- Vischer, A. D., Noel, M. P., & Smedt, B. D. (2016). The role of physical digit representation and numerical magnitude representation in children's multiplication fact retrieval. *Journal of Experimental Child Psychology*. 152, 41-53.
- Voinea, M., & Purcaru, M. (2013). Boosting romanian students' interest in learning Mathematics through the constructivist approach. *Procedia-Social and Behavioral Science*. 127, 108-113.
- Ziegler, G. M., & Loos, A. (2014). "What is mathematics?" and why we should ask, where one should experience and learn that, and how to teach it. *Proceedings of the 13th International Congress on Mathematical Education*. 63-77.