

# THE IMPACT OF CRITICAL THINKING ON LEARNING ENGLISH LANGUAGE

A. Gandimathi<sup>1\*</sup>, Nafiseh Zarei<sup>1</sup>

<sup>1</sup>Faculty of Education and Humanities, UNITAR International University, Malaysia

\*Corresponding author, a\_gandi04@yahoo.com

## ABSTRACT

Critical thinking has been encouraged largely in Malaysia to create awareness to the public. This is due to the fact that students are not able to use their critical thinking skills in classroom activities. Nowadays, some teachers use the traditional method of teaching whereby the students may not be given the opportunity to think critically. As such, if critical thinking is initiated in schools, it would mould citizens who are more creative and able to use their skills effectively later. This study investigates the use of critical thinking in language learning and how it enhances English language among ESL learners. A qualitative method was used and data were collected using semi-structured interview. The sample involved 30 post graduate students in Selangor in order to gain a deep insight of students' critical thinking enhancement in English language learning. The data were analysed qualitatively using content analysis. The findings of the study revealed that students were able to learn better using critical thinking which enhanced their English language skills. In conclusion, the results indicated that the students were able to engage in reflective and independent thinking to solve problems in learning by using critical thinking.

**Keywords:** critical thinking, constructivism, ESL learners, language learning

## INTRODUCTION

Critical thinking in education can be traced to Dewey's (1916), an American philosopher who declares that teaching students how to think is the purpose of education. According to Dewey (1916), students did not arrive at school as blank slates. By the time the learner entered the classroom, he was 'already intensely active, and the question of education is the question of taking hold of his activities, of giving them direction'. Philosophy of Education becomes the criteria for determining the purpose, organization and implementation of the curriculum in the classroom. Progressivism is a philosophical belief which states that humans study best through nature and real-life activities. Dewey was mainly responsible for the movement of progressivism. As such, critical thinking can be evoked by teaching and discussing topics which would be beneficial to the students at present and for the future. Based on a constructivist lesson which promotes critical thinking is rooted in an authentic context that draws upon the students' real-world experience. Application of the principles of constructivism can be used in classroom teaching and together with the help of the internet. As a teacher and lifelong learner, one of the most powerful and rewarding instructional tools at your fingertips is the Internet. Within seconds, an entire civilization or country thousands of miles away is at your desktop.

Critical thinking is also important to institutions of higher education. In a survey done by the Association of American Colleges and Universities (AACU, 2011), critical thinking was rated as one of the most essential intellectual skills for students. This is based on the evaluation by 95% of the chief academic officers from 433 institutions. This study investigated how critical thinking helps students in English Language learning and it focuses on the students' use of critical thinking and its effect on enhancing English Language.

## LITERATURE REVIEW

Critical thinking is the process of thinking that questions ideas and is a way to ascertain whether a claim is true, false, or partly true. "It is a self-guided, self-disciplined thinking which attempts to reason at the highest level of quality in a fair-minded way" (Mathews & Lowe, 2011). Critical thinking skill does not develop spontaneously but on the contrary, teachers must take a directive role whereby they can initiate and guide critical thinking. In language classes, critical thinking can be used as a medium and is particularly appropriate for the richness of material and the approaches which are interactive. Critical thinking also plays a great role in enhancing English language and to consistently apply it to real-world situations (Butler, 2012).

A critical thinking approach questions the students' minds, and enables the students to work with the knowledge being learned. Teachers can set goals or learning outcomes which are feasible whereby students are able to achieve. The readings, questions, and exercises in the lesson encourage students to use language to discover the answers. Students and teachers work together to understand, analyze and evaluate the contents of the lesson to reach the outcomes which has been stated. Skills in the cognitive domain revolve around knowledge, comprehension, and critical thinking of a particular topic. When learning outcomes are provided to students, they can critically think about information and develop their own answers in a meaningful way. Krashen (1988) believed the best way to acquire a second language is through natural communication rather than repetition of words and grammar.

Based on studies carried out by Behar-Horenstein and Niu (2011); Fahim and Masouleh (2012), the scholars believe that critical thinking skills can be taught. There have been different methods to teaching critical thinking skills which have been used and thus have evolved over time. In a study by Marin and Halpern (2011), online tutorials using topics were used and students were required to respond. Marin and Halpern's findings showed that explicit critical thinking instruction has created a much positive impact on students' critical thinking levels. Abrami (2008) found that critical thinking should be explicitly taught and it would be effective to incorporate it into academic content. On the other hand, Ramsay (2009) also refers to how infusing critical thinking shows impact into reading and writing courses across disciplines. As critical thinking involves analysis, a student needs to be able to evaluate and justify the topic in discussion. In that sense, it is usually connected with problem solving and communication. Also, in being critical, students must possess the capacity to visualize and evaluate alternative options (Chabrak & Craig, 2013).

Educators should assist students reflect on their studies so that they can understand their lesson better. Yang, Gamble and Jeffrey (2013) did a study on an experimental group learners, which showed a significant improvement in English proficiency compared to the control group. The study highlights that learners cannot enrich the aspects of education and language learning if they do not creatively think about the task given to them. They need to be mindful and consciousness of their knowledge in generating creativity within language. When this reflective thinking happens, it would give rise to changes in styles of thinking and problem solving. Thus, students learn how to probe questions and learn on their own effort. Yang (2014) shows the effect of adapting critical thinking in language acquisition using a Moodle system. The empirical results showed that critical thinking enhanced adaptive English literacy instruction which simultaneously improved students' critical thinking and English literacy. It shows that students study better when they are given the freedom to explore learning. Being able to make choices and taking responsibility for their own learning activities are two facets of learning independently with the use of critical thinking. Marin & Halpern (2011) have proved that using the Halpern Critical Thinking Assessment, positive results were seen in students who received explicit instruction compared to those in the Imbedded Instruction group.

Based on educational research, we know that learners can adopt a comprehensive learning approach which requires a critical understanding of material. Students are able to construct their own learning through becoming active participants. Bean (2011) associated deep learning approaches with 'affective involvement' which is supported by interaction. As seen, constructivist principles engage student in the classroom with effective interaction, scaffolding and encouraging critical thinking among students. Students do not only acquire knowledge, but use them a step further in real world situation at work place or society. Thus, it is seen that the questions asked and answers given reflect on one's thought which promotes higher-level thinking. In recent time at work place, employers look for prior experience to qualify as a basic quality for professionals. In accordance with this, many employers feel that fresh graduates are not prepared to join the workforce and are unable to apply knowledge and skills such as critical thinking and communication in a real-world setting (Klebnikov, 2015).

## METHODOLOGY

This qualitative study investigated how critical thinking helps students in English Language learning and it focuses on the students' use of critical thinking and its effect on enhancing English Language. The sample were 30 Malaysian ESL learners from UNITAR International University who were post-graduate students enrolled in English Language course and for purposive sampling. A semi-structured interview, open-ended questionnaire, and essay writing were used for the purpose of triangulation and data collection. The questions were based on critical thinking skills and the effectiveness of the skills. The researchers interviewed all the participants individually in order to gain indepth information. The interview sessions were recorded and transcribed by the researchers. The open-ended questionnaires were distributed among the participants in a classroom at UNITAR International University. The participants were allowed to seek help from the researchers to clarify their doubts if any questions were ambiguous or unclear. In addition, the participants were given sufficient time to answer all the questions carefully. For the third research instrument, the participants were asked to write an essay on a particular topic which reflected their critical thinking.

## RESULTS

The purpose of this study was to explore the impact of critical thinking skills on enhancing English Language. The students found critical thinking skills appropriate and useful for learning English language. In addition, their attitude towards the learning situation has a direct impact on the acquisition of the language as a whole. Based on the findings of this research, critical thinking is the ability to measure situation and derive with accurate decisions. Based on the findings of this study, critical thinking was used for constructing knowledge. In a constructivist model of learning, inquisitiveness drives learners' learning and constructivism explains an individual's progress to obtain new knowledge. Constructivist learning is seen as an authentic assessment strategy which does not only depend on memorization and recall (Gronlund and Waugh, 2009) In the contrary, it is seen as a framework which enables students to engage in tasks and they can actively construct their knowledge.

Social constructivist thinking and theories in the role of learning has been researched in realistic classroom contexts. In such environment, learners collaborate and teachers offer feedback during activities which helps to support and challenge them (Skinner, 2010). Research suggest that infusing thinking in certain subjects works better, but thinking needs attention no only at the core, but all areas of the subject matter (Burks, 2007). For instance, students mentioned that:

*"It is a combination of old and new knowledge whereby critical thinking can able one to act independently." (Student. 12)*

*"Critical thinking involves more reading and students have a better idea in constructing their own knowledge on the project involved." (Student. 6)*

*"It enables one to think out of the box as they construct their thoughts and understanding of a given subject." (Student. 8)*

*"Critical thinking promotes higher order thinking skills and not merely thinking on the surface." (Student. 1)*

*"It allows students to think clearly and rationally as if gives them an opportunity to be different." (Student. 30)*

*"Critical thinking allows students to question on a subject or idea and able them to give their opinion." (Student. 14)*

The students agreed that they need good critical thinking skills as it allows them to solve problems. In other words, they confirmed that critical thinking supports their understanding in learning. In a similar study by Pascarella (2013), it was shown that students tend to think in a more logical and structured way when they are engaged actively in their classroom environment. Vygotsky (1934) informs that cognitive development originates from social interactions from learning which is guided within the zone of proximal development. This happens when learners and their partners work collectively to construct knowledge. Students' engagement in class environment can be correlated to transformative learning theory and are congruent within the learning theories. Critical thinking is the art of analyzing and evaluating thinking with a view to improving it (Paul & Elder, 2014). Through transformative learning which is increasing in the recent years, students' progress and become independent learners. Introduced by Jack Mezirow, this theory refers to how learning that involves critical reflection can cause transformations in learners' mind (Mezirow & Ass., 2000).

According to the respondents' feedback, critical thinking supported their learning and problem solving in the classroom, as the excerpts from their interviews showed:

*"Critical thinking is important for effective learning and understanding. They are able to understand a subject better and find solutions which are unique." (Students 23)*

*"Students are able to use critical thinking and derive their own meaning from their studies." (Student 3)*

*"Students become independent learners whereby they create their own knowledge." (Student 14)*

Based on a study by Elder and Paul (2006), critical thinking is claimed to be important in the acquisition of language skills especially writing and reading. Providing EFL learners at various levels of proficiency with critical thinking activities will assist them in moving beyond what they have learnt from the text. As critical thinking challenges the students, it facilitates decision making. Waters (2006) reaffirms that thus it creates a classroom that supports collaboration, acceptance of different views and expression of one's own beliefs. The application of critical thinking for teaching and learning language is been investigated and is underpinned by critical language awareness. In addition, Lin and Mackary (2004) reflected in their study that thinking skills can facilitate language learning. Moreover, studies have shown that critical thinking skill assist learners to find different ways to make inferences and to analyse as well as to solve problems. This enables one to have a better understanding of English Language and to use the language in a more proficient way (Liaw, 2007).

*"Critical thinking motivates and gets a student more involved in learning as they speak and learn vocabulary." (Student 6)*

*"When a student reads with a critical mind, it involves active participation and communication which assist in language enhancement." (Student 21)*

*"When critical thinking is applied in language learning, students acquire better presentation skills and also improve their communication skills." (Student 18)*

*"Students are able to relate better with examples rather than memorizing which gives them a better understanding of the subject matter." (Student 9)*

*"Reading with a critical mind helps one to explain using constructive language." (Student 27)*

All students agreed that critical thinking is an essential tool and helps in effective learning. The postgraduate students feel that critical thinking has been helpful to them in their daily lives. McArthur states that the quality of thought has a direct effect on a person's quality of life. This shows that critical thinking assist students in their day to day life such as at work and studies. It reflects how they interact in society and their ability to apply critical thinking skills. An aspect of language learning is seen through writing skill. In a critical writing pedagogy done by Morrell (2008), it is shown the connections between writing, intellectual engagement, criticality and emotion. He indicates the way writing can enhance a process of imagination which promotes a critical written work. Through the process of engaging students in activities that promote critical thinking, it bring about ideas which enables them to analyse, critically evaluate and assess their abilities to do so.

One way to promote critical thinking is through problem based learning. It has been shown that through Problem-based learning, students have developed in their critical thinking (Peach, Mukherjee, and Hornyak, 2017). In an environment whereby a problem is given, it enables students to focus on the purpose and who it is directed to rather than teacher driven assignment. Moreover, working in groups assist students to brain storm the fact which are latent to produce collaborated projects which shows unity and maturity in thinking.

*"Critical thinking provides solutions in work and studies. Also, it enables one to compare and contrast an idea which brings about a strategic solution."(Student 7)*

*"Using critical thinking assist students in their studies with less supervision." (Student 15)*

*"Critical thinking has been helpful for me as a student as I am able to study without much supervision from the teacher." (Student 3)*

*"It prepares students to in their presentation skills as learning would not be confined to only syllabus." (Student 11)*

*"Critical thinking promotes active learning and it acts as a tool for communicative learning." (Student 25)*

*"Students create ideas and come up with different opinions which enables them to think beyond." (Student 18)*

*"It helps to ascertain a student's level of understanding on a given task and to intervene if necessary." (Student 13)*

This showed that students are able to reflect on their own learning and complete their task. The findings also revealed that critical thinking plays a crucial part in their academic performance. Critical thinking helps the postgraduate students in the development of their studies and also able to edit their own assignments. Critical thinking scholars agree and have confirmed on the importance of getting students engaged in authentic practices (Kim & Furlong, 2013; Zapatero, 2012). It also provides meaningful contexts that will enhance students' ability to apply what they have learned. This is shown in Vygotsky's theory (1934) which highlights the fundamental role of social interaction in the development of cognition. This fact is strongly supported by the fact that community plays an important role in the process of "making meaning."

*"Through critical thinking, we are able to find information needed in order to complete our assignments." (Students 16)*

*"As students, we are able to search for relevant information related to the topic of our studies." (Student 24)*

*"As a student, critical thinking assist academic performance as active learning takes place." (Student 5)*

*"Students in higher institutions are able to work independently in the absence of the lecturers." (Student 19)*

*"In academic performance, critical thinking allows a student to open up their mind and this enables them to obtain more knowledge." (Student 23)*

*"Students are not confined to text books only and rather explore other possibilities of learning and obtaining knowledge." (Student 15)*

The students were able to compare and contrast journals to get a better idea and to make conclusions. They use critical thinking as a method to evaluate the information obtained and to get answers.

*"Students in advance level can combine their own opinions with added knowledge." (Student 7)*

Another way to foster critical thinking is through problem based learning which has been shown by researchers to support development of students' critical thinking (Hornyak, 2007). Moreover, critical thinking promotes effective learning when students share ideas among themselves and construction of mutual understanding. Collaborative learning is an effective instructional method which provides students with the opportunity to work together on subject related activities in order to enhance their understanding and to apply the knowledge which has been acquired. (Alkeaid, 2007) This is made easier with the aid of computer whereby students are able to collaborate their ideas for better learning. According to Tsvitanidou, Zacharia, and Hovardas (2011), they discovered that learning activities done through peer can encourage positive learning attitudes on the part of students.

*"Students compare and contrast ideas in the process of using critical thinking." (Student 9)*

*"Critical thinking is an important tool in enhancing their writing skill as they plan and thus allow the students to express further." (Student 18)*

*"It is an effective learning tool and used for problem solving task." (Student 12)*

*"Students can learn independently in group projects and critical thinking aids in effective learning." (Student 6)*

*"Critical thinking can be applied in task based learning and the teacher takes the role of a guide." (Student 4)*

Moreover, students feel collaborative tools such as computer should be included in teaching critical thinking skills.

*"Critical thinking tools are relevant and should be used to assist learners." (Student 7)*

*"Technology tools are used to achieve a common goal or objective and helps them to see their level of understanding." (Student 5)*

*"Collaborative tools and IT application enable students to get immediate response and prompt answer." (Student 9)*

*"Use of group task for discussion and with the help of technology, students can work in the flexibility of their own time." (Student 27)*

*"Online tools promotes communication as the students share ideas with their peer groups." (Student 10)*

Technology helps in research and it is an essential tool to complete assignment and projects. In a situation when additional information is needed in learning, materials can be obtained from different websites. Through the online student-generated question technology introduced in this study, it has brought much potential to enhance teaching and also the virtual interaction among learners (Wu & Yu, 2009). Vygotsky (1934) relates the Zone of Proximal Development as the area where the utmost guidance or instruction should be given. This allows the learners to develop skills that they will be able to use on their own to develop higher order thinking. Thus, ICT (Information and communications technology) in critical thinking attracts students and they are able to learn better. Students are adapting a new constructivist based model whereby they are active learners than being passive learners. This approach or change in focus has enabled educators to be more flexible in delivering and learners to experience innovative methods of learning. A study by Howlett, Ferreira and Blomfield (2016) showed that genuine transformative learning can occur within a constructivist informed pedagogical approach and shows how students are able to sustain what is learned. The findings are clear and appropriate conclusions were drawn.

Another aspect to effective learning is through peer support as they share ideas and thoughts. This adds value to education and the students have the opportunity to learn the detailed instructions provided by the teacher, and also to learn from peers' work since they play the role of a critic (XM Wang, Hwang, Liang & HY Wang, 2017). Through collaborative work, practicing critical thinking and giving suggestions and feedback to their peers is feasible (Hovardas, Tsivitanidou, & Zacharia, 2014). A study by McLoughlina and Mynardb (2009) shows that there was evidence of higher-order thinking in online discussions, but it was present predominantly at the exploration phase. According to Costa and Kallick (2009), a student's learning process changes from receiving knowledge in a passive manner to actively producing knowledge through practising reflective thinking. Here, the teacher plays the role of a facilitator by assisting them and with the purpose of developing critical thinking in a student.

Knowledge acquisition under controlled environments is not the ultimate method for education. One of the desired outcomes of education is the ability to think critically and thus it fosters the basic human capabilities (Pavlidis, 2010). It also depends on the individual's disposition to reflect on the internal questions and answers that follows and at the same time make alternative possibilities in a given situation (Celuch, 2010). Development in learning can be sought through integrated teaching approaches whereby students think critically and go through natural learning as strategies that facilitate learning. In line with Vygotsky's Theory which promotes learning contexts, students play an active role in the development of their learning. Teachers can guide students in order to facilitate learning and it becomes a reciprocal experience for both the students and teacher. As we can see in this study, the use of critical thinking enhanced learning and students become independent learners.

## **CONCLUSION**

By integrating learning and critical thinking, students' engagement on the subject matter can be improved. During the process of initiating critical thinking, exploratory task is utilized and it has a close connection with reflection as it encourages students to think independently (Bean, 2011). In addition, in a study by Zemsky (2009), it is argued that the focus should be on high-priority material which simultaneously promotes critical thinking rather than content coverage. In addition, researchers should delve more into the aspect of critical thinking whereby more suggestions are available for the public. The importance of critical thinking should be highlighted and the government should make room for these to happen through the curriculum. Bringing critical thinking in classrooms is beneficial as it deals with real life situations. As a whole, critical thinking should be started from a young age which would enable students to cultivate creative and critical thinking through-out their studies. On the long run, students would be able to use their critical thinking in their working life. By using critical thinking and structured controversy, students' curiosity for searching for solutions to the problem will be sparked, engaging them in active learning that will help develop their understanding and appreciation of diverse points of views. It

also requires students to use complex reasoning and critical thinking skills. As a result, students are exposed to a greater range of ideas that will help them to generate creative solutions and new conclusions to their controversial problem. Thus, it shifts students' way of thinking to a higher level and promotes better learning.

## REFERENCES

- Alkeaid, A. (2007). ISO 9000 and Creativity: Potential Advantages of Implementing ISO in Community Colleges. *College Student Journal*, 41(3).
- Behar-Horenstein, L. S., & Niu, L. (2011). Teaching critical thinking skills in higher education: A review of the literature. *Journal of college teaching and learning*, 8(2), 25.
- Bean, J. C. (2011). *Engaging ideas: The professor's guide to integrating writing, critical thinking, and active learning in the classroom*. John Wiley & Sons.
- Burks, D. (2016). *Learner's Perception of Social Presence in the Online Learning Environment*. Northcentral University.
- Butler, H. A. (2012). Halpern Critical Thinking Assessment Predicts Real-World Outcomes of Critical Thinking. *Applied Cognitive Psychology*, 26(5), 721-729.
- Celuch, K., Kozlenkova, I., & Black, G. (2010). An exploration of self-efficacy as a mediator of skill beliefs and student self-identity as a critical thinker. *Marketing Education Review*, 20(3), 255-264.
- Chaiklin, S. (2003). The zone of proximal development in Vygotsky's analysis of learning and instruction. *Vygotsky's educational theory in cultural context*, 1, 39-64.
- Costa, A. L., & Kallick, B. (2009). *Habits of mind across the curriculum: Practical and creative strategies for teachers*. ASCD.
- Dewey, J. (1916). *Democracy and Education*, New York. Macmillan). *If you see John Dewey, tell him we did it. Educational Theory*, 37(2), 145-152.
- Duncan, D. W., Birdsong, V., Fuhrman, N., & Borron, A. (2017). The Impacts of a National Internship Program on Interns' Perceived Leadership, Critical Thinking, and Communication Skills. *Journal of Leadership Education*, 16(2).
- Eftekhari, M., Sotoudehnama, E., & Marandi, S. S. (2016). Computer-aided argument mapping in an EFL setting: does technology precede traditional paper and pencil approach in developing critical thinking?. *Educational Technology Research and Development*, 64(2), 339-357.
- Fahim, M., & Masouleh, N. S. (2012). Critical thinking in higher education: A pedagogical look. *Theory and practice in language studies*, 2(7), 1370.
- Grieco, L. N. (2016). *Meeting the demands of the 21st century workplace: Effects of critical thinking instruction on the application of critical thought* (Order No. 10103879). Available from ProQuest Dissertations & Theses Full Text: The Humanities and Social Sciences Collection.
- Howlett, C., Howlett, C., Ferreira, J. A., Ferreira, J. A., Blomfield, J., & Blomfield, J. (2016). Teaching sustainable development in higher education: Building critical, reflective thinkers through

- an interdisciplinary approach. *International Journal of Sustainability in Higher Education*, 17(3), 305-321.
- Kim, K., Sharma, P., Land, S. M., & Furlong, K. P. (2013). Effects of active learning on enhancing student critical thinking in an undergraduate general science course. *Innovative Higher Education*, 38(3), 223-235.
- Krashen, S. D., & Terrell, T. D. (1983). The natural approach: Language acquisition in the classroom.
- Kumar, R., & Refaei, B. (2017). Problem-Based Learning Pedagogy Fosters Students' Critical Thinking About Writing. *Interdisciplinary Journal of Problem-Based Learning*, 11(2), 1.
- Marin, L. M., & Halpern, D. F. (2011). Pedagogy for developing critical thinking in adolescents: Explicit instruction produces greatest gains. *Thinking Skills and Creativity*, 6(1), 1-13.
- Mathews, S. R., & Lowe, K. (2011). Classroom environments that foster a disposition for critical thinking. *Learning Environments Research*, 14(1), 59-73.
- McLoughlin, D., & Mynard, J. (2009). An analysis of higher order thinking in online discussions. *Innovations in Education and Teaching International*, 46(2), 147-160.
- Mendelowitz, B., & Mendelowitz, B. (2017). Conceptualising and enacting the critical imagination through a critical writing pedagogy. *English Teaching: Practice & Critique*, 16(2), 178-193.
- Mroz, A. (2015). The development of second language critical thinking in a virtual language learning environment: A process-oriented mixed-method study. *Calico journal* 32(3), 528.
- Neal, J. (2009). The Power of Performance Based Assessment at the Post-Secondary Level. *International Journal of Learning*, 16(9).
- Newman, D. R., Webb, B., & Cochrane, C. (1995). A content analysis method to measure critical thinking in face-to-face and computer supported group learning. *Interpersonal Computing and Technology*, 3(2), 56-77.
- Pavlidis, P. (2010). Critical thinking as dialectics: a hegelian-marxist approach. *Journal for Critical Education Policy Studies*, 8(2), 74-102.
- Rashid, R. A., & Hashim, R. A. (2008). The relationship between critical thinking and language proficiency of Malaysian undergraduates.
- Raikou, N., Karalis, T., & Ravanis, K. (2017). IMPLEMENTING AN INNOVATIVE METHOD TO DEVELOP CRITICAL THINKING SKILLS IN STUDENT TEACHERS. *Acta Didactica Napocensia*, 10(2), 21-30.
- Savery, J. R. (2015). Overview of problem-based learning: Definitions and distinctions. *Essential readings in problem-based learning: Exploring and extending the legacy of Howard S. Barrows*, 9, 5-15.
- Tedesco-Schneck, M. (2013). Active learning as a path to critical thinking: Are competencies a roadblock?. *Nurse education in practice*, 13(1), 58-60.
- Vygotsky, L. (1978). Interaction between learning and development. *Readings on the development of children*, 23(3), 34-41.
- Wang, X. M., Hwang, G. J., Liang, Z. Y., & Wang, H. Y. (2017). Enhancing Students' Computer Programming Performances, Critical Thinking Awareness and Attitudes towards

Programming: An Online Peer-Assessment Attempt. *Journal of Educational Technology & Society*, 20(4), 58-68.

Williams, B. (2001). Developing critical reflection for professional practice through problem-based learning. *Journal of Advanced Nursing*, 34(1), 27-34.

Wu, C. P., & Yu, F. Y. (2009). Changing students' perceived value and use of learning approaches for online student-generated questions via an integrative model. In *Workshop Proceedings of The 17th International Conference on Computers in Education: ICCE* (pp. 30-34).

Yang, Y. T. C., & Wu, W. C. I. (2012). Digital storytelling for enhancing student academic achievement, critical thinking, and learning motivation: A year-long experimental study. *Computers & Education*, 59(2), 339-352.

Yang, Y. T. C., & Gamble, J. (2013). Effective and practical critical thinking-enhanced EFL instruction. *ELT journal*, 67(4), 398-412.

Yang, Y. T. C., Gamble, J. H., Hung, Y. W., & Lin, T. Y. (2014). An online adaptive learning environment for critical-thinking-infused English literacy instruction. *British Journal of Educational Technology*. 45(4), 723-747.

Zemsky, R. (2009). *Making reform work: The case for transforming American higher education*. Rutgers University Press.