

IMPLEMENTATION OF ENTREPRENEURSHIP, BUYING AND SELLING ACTIVITIES IN MATHEMATICS LEARNING TO PROMOTE STUDENTS INTERACTION AND METACOGNITIVE REGULATION SKILLS

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Abstract: Metacognitive regulation skills and interaction are interrelated elements in mathematics learning to enhance the engagement and focus of the students. Interactions will affect the development of metacognitive regulation skills. Metacognitive regulation skills will ensure students' mathematics problem solving is well managed to provide an accurate solution. One of the factors contributing to weak mastery of mathematics among students is learning activities do not ensure optimal interaction. Therefore, initiatives need to be implemented to address the problems. So, the present study will propose, summarise and discuss the implementation of entrepreneurship, buying and selling as an activity that can encourage students to interact and develop as well as to train their metacognitive regulation skills. Articles around 2009 and up to date have been explored based on approaches, methods, techniques, and practices of entrepreneurship learning strategies implemented. A total of 8 articles were selected through a search of databases such as Google Scholar, Researchgate, ERIC, SpringerLink, Elsevier and more. Systematic reviews and discussions through previous research show that the effectiveness of the implementation of buying and selling activities in mathematics learning is creating interaction and leading to increased student metacognitive regulation skills.

Keywords: Metacognitive regulation, interaction, entrepreneurship, buying selling, mathematical learning.

Introduction

Mathematics learning is a process for changing the coordination of thought, which is to explain something abstract and to link numbers, symbols, shapes, patterns and so on to form a real concept. Chris (2015) stated that mathematical learning is not only focused on telling but also requires strengthening to enhance individual intellectual credibility. Therefore, the teacher needs to change the learning approach from conventional methods as a presenter to learning agents who are seen to be more widespread for providers, drivers, facilitators and coordinators to learn. Learning materials are not entirely on the teacher, but students are also learning resources for other students (Pokhrel, 2018). This learning transformation requires teachers to manage to learn more effectively. Students should also become managers of self-study more systematically and efficiently.

To improve learning management efficiency, metacognitive regulation is a positive indicator that will ensure students become active during the learning process. Metacognitive regulation is a component of metacognition that is according to Schraw and Moshman (1995) the ability of the individual to regulate their cognition by controlling, monitoring and acting systematically. Subcomponents in metacognitive regulation are constructs that demonstrate the process of new knowledge development (Schraw & Moshman, 1995; Hasbullah, 2015). Through planning constructs, students will set learning goals, set up the way how to achieve the goals and know the previous knowledge to be used (Moos & Ringdal, 2012). Construct monitoring will ensure that students are always aware of the level of understanding, strategies used, reducing mistakes, confirming the knowledge to be developed is the right concept (Stephanou & Mpiontini, 2017).

Moreover, the evaluation construct will help students build confidence with new knowledge, test the effectiveness of the strategies used and evaluate the strength of knowledge (Schraw & Moshman, 1995). Cognitive management skills are seen as meaningful in individual learning so that mathematics learning is closer to the ability of cognitive and metacognitive setup and their coordination (Su *et al.*, 2016).

Accordingly, mathematics learning should be a focus on the development of metacognitive regulation to enhance student performance. A low level of student mastery in mathematical concepts is not a new issue, but it still cannot be solved although it has been done in various ways. Most factors are learning activities conducted in the classroom (Willis, 2010). Therefore, the researcher proposes a learning activity to ensure mathematics learning is more fun and can develop metacognitive regulation skills in line with the desire to improve student achievement. In this regard, to strengthen cognitive development, learning must be conducted as a cognitive activity, which is a mind-challenging activity to ensure students' metacognition fully in function (Du Toit & Kotze, 2009).

Besides that, to achieve the purpose of learning activities that can develop metacognitive regulation is through interactive activities. Active involvement and effective interaction should be examined in selecting the activity. This is because according to Smith & Mancy (2018), during actual learning student interaction will lead to metacognitive discussion. Metacognitive elements will be the main focus when interacting with a peer during learning. Hence, there is a need for further studies that examine learning activities that can encourage students to metacognitive regulation skills and interactions. When the interaction is well-executed, it will produce effective learning. Dagarin (2005) and Jose (2016) stated that interactions can occur between students with teachers, students with students, students with materials and can also be between students with themselves. Specifically, student interaction with self is individual in nature leading to

the formation of self-regulation and this will encourage the learning process. According to Schraw and Moshman (1995), if the situation was forced to act in designing, monitoring and evaluating learning, then the metacognitive regulation development had improved. In the context of the success of mathematical learning, the interaction will ensure that students can express ideas using numbers, symbols, diagrams and so on in all forms of oral, written or visual (Mary, 2017; NCTM, 2000).

In this context, the researcher proposes a learning activity that can ensure optimum interaction that involves the implementation of entrepreneurial activities in buying and selling. Studies conducted by Palmer and Johansson (2018), Shanklin & Ehlen (2017), Noor Izzuddin *et al.*, (2014), Ishak *et al.*, (2018), Rayung and Ambatong (2018), Almahry *et al.*, (2018) and Rahmawati (2017) have shown that buying and selling activities can increase focus, active involvement and ability to master the contents of the lesson. According to Palmer and Johansson (2018), entrepreneurship competence will create mathematical competencies leading to thinking skills. Therefore, buying and selling can be a platform to ensure interaction. According to Mantell *et al.*, (2002) and Goh (2010), buying and selling activity is favourable to children and it is a cognitive need and the ability to coordinate problem-solving among children when selling and buying is made into a learning game. Buying and selling is the basic experience that all individuals have. Poh (2000) said that, according to contextual theory, learning will be easier than the experience and knowledge framework that exists in the minds of individuals. In this regard, Schraw and Moshman (1995) and, Nelson and Narens (1990) argued that each individual has the metacognitive experience that will be the basis for constructing a piece of new knowledge. This metacognitive experience will be easier to regulate when there is positive motivation through effective interaction.

Conceptual Framework of Entrepreneurship, Buying and Selling Activities (EBSA)

The study was aimed at discussing the effectiveness of learning activities through the implementation of entrepreneurship, buying and selling activities (EBSA). Based on the Constructivist Theory, Vygotsky's Social Development Theory and Metacognitive Theory, a learning activity, students' interaction, and metacognitive regulation skills that will be constructed are seen to influence students' learning and their mastery. From constructivism beliefs, learning is one of the processes that students modified their previous skills, experience, and knowledge in order to construct and understand the new concept. Interactions, mediations, and scaffolding become the important elements in Vygotsky's Theory as a social connector to develop the potential and ability of the student in learning. Besides, Metacognitive Theory proposed metacognitive learning strategies to optimise the awareness, regulation, and experience of students in

cognitive aspects during the learning process. A conceptual framework was developed to see the relationship between the EBSA as a learning activity, students' interaction and metacognitive regulation skills that will be the variables in this study. According to Sethughes (2013), the basis of buying and selling must include the aspects of place, product, price, and promotion. Next, Rahmawati (2017) explained the five components in the buying and selling game based on marketing activities as i) the role of the student as either the seller or the buyer, ii) the game instructions or the way of how to operate, iii) the product, iv) the process of trading activities and v) discussions. Therefore, the review summarises the construct as a phase in trading activity.

According to Vygotsky's Theory, learning will occur when there is an interaction between students (McLeod, 2018). When interacting, students will develop the individual potential to enhance understanding of the lesson's contents. Through this activity, the students, especially

Table 1: Implementation of trading activity phases and relating it o the learning dimensions

Phases	Implementation of entrepreneurship, buying and selling activities (EBSA)	Learning Dimensions
<u>Place</u> -Buyer and seller -Instructions	i. Buying and selling goals ii. Determining of roles of buyer or seller iii. Organising/conducting the activity or instruction	i. Learning objectives ii. Students' role in learning iii. Rules or learning activities are conducted
<u>Product</u> -Preparing the product -preparing the presentation needs	i. Sale product ii. Buyers' needs	i. Learning matters or resources ii. Presentation materials iii. Mathematics problem-solving strategies
<u>Price</u> -Set the price	i. Sale price	i. Learning motivation ii. Question levels/tasks
<u>Promotion</u> -Trading activities	i. Buying and selling process	i. Discussion/presentation ii. Interaction

Source: Sethughes (2013) and Rahmawati (2017)

in the process of selling and buying products, will apply the concept of Zone of Proximal Development (ZPD) and More Knowledgeable Other (MKO). There will be a mentoring, tutoring and guiding process. Therefore, buying and selling are scaffolds for interactions and this is in line with the concept of scaffolding based on Vygotsky’s Theory (McLeod, 2018). According to the Constructivist Theory, the actual learning experience will ensure that students learn. This is because minds-on and hands-on appreciation will occur and contribute to meaningful learning (Nik Pa, 1999; Poh, 2000).

Through the four phases in trading activities, students will develop metacognitive regulation skills. For example in a place phase, students will plan learning requirements in the role played by either the seller or the buyer. During the course of the product phase, price and promotion will increase students’ ability to monitor and evaluate learning through interaction with other students during activities. Students will check the level of understanding and evaluate the learning strategies implemented. This illustrates the role of metacognitive regulation skills in driving learning (Schraw & Moshman, 1995; Du Toit & Kotze, 1999). At the same time it improves the thinking skills and mathematics problem-solving skills.

Metacognitive Theory illustrates how restructured knowledge is got through metacognitive relationships and self-regulated processes (Schraw & Moshman,

1995). Metacognitive experts have explained how metacognitive components consist of metacognitive knowledge and metacognitive regulation action affecting individuals as well as learning actions in order to master the subject matter (Menz & Cindy Xin, 2016; Pantiwati & Husamah, 2017). In the process of the students are made aware of their abilities and effectively manage the metacognitive aspect of learning that can increase mastery (Cera *et al.*, 2013). An active learning environment that optimises interaction will create learning scenarios through metacognitive development and increase self-determination and self-belief of students. The combined results of Constructivist, Vygotsky’s and Metacognitive theories will contribute to the achievement of learning objectives and student performance.

Methodology

The purpose of this present study is to examine the implementation of entrepreneurship, buying and selling activities in mathematics learning which can influence the students’ interaction and metacognitive regulation skills that will enhance student engagement, performance, and achievement. Hence, the research questions are being developed to achieve the objectives of this review. The research questions are i.e. how do EBSA in mathematics learning create student’s interaction and develop metacognitive regulation skills? What is the impact of EBSA on student mathematics learning?

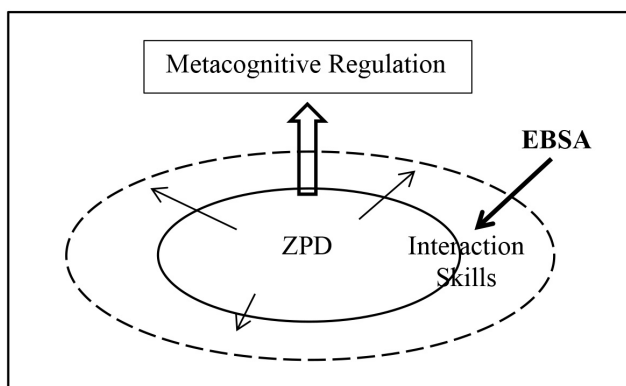


Figure 1: The Conceptual of Mathematics Learning of EBSA

Furthermore, searching for articles and journals that lead to applications of entrepreneurship education and learning, buying and selling activities, student interactions, metacognition regulation or a combination of these keywords is initiated through databases such as Google Scholar, Researchgate, ERIC, SpringerLink, Elsevier, and some other databases. Journals or articles related to the area of study are selected by first looking at the abstract and if related, the journal contents are viewed more specifically. Literature,

data, findings, results, and discussion will be fully referred to. The searching process is the implementation of Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) proposed by Moher et al (2009). Eight articles were selected after going through the steps of *Identification, Screening, Eligibility* and *Included*. The following table shows the implementation of entrepreneurial skills, buying and selling activities conducted by some researchers in the context of learning.

Table 2: Analysis of Implementation of Buying, Selling and Entrepreneurship Activities in Learning

Author(s)	Research Objective(s)	Learning aspects discussed through activities	Impact on the students
Hanna Palmer & Maria Johansson (2018) Combining Entrepreneurship and Mathematics In Primary School-What Happens? <i>Journal Education Inquiry</i> , 9(4)	To explore what happens when entrepreneurship is integrated into mathematics lessons	<ul style="list-style-type: none"> i. Discuss the potential of combining the teaching of entrepreneurial and mathematical competencies in schools ii. Implement the entrepreneurship principles to solve mathematics problems in learning i.e creativity, ability to take responsibility, having courage, and ability to take initiative 	<ul style="list-style-type: none"> i. Increase mathematical competencies ii. Train the strategies of problem solving iii. Increase critical thinking
Eka Rahmawati (2017) The influence of buying-selling Equipment on Learning Math Results About Money Class I in Basic School (Experimental Research in The Low Class). <i>Published Version Thesis Online. Universitas Negeri Jakarta.</i>	To determine the difference of mathematics learning outcome of money between students who follow the learning with the activities of buying and selling games and students who follow the learning conventionally	<ul style="list-style-type: none"> i. Implement of buying and selling activities during mathematics learning ii. Create the principle of buying and selling activity i.e targets, student role plays, product, buying and selling process, discussion setting 	<ul style="list-style-type: none"> i. Impact on the students' performance ii. Increase students' problem-solving skills

<p>Fatima Fouad Almahry, Adel M. Sarea & Allam M. Hamdan (2018)</p> <p>A Review Paper on Entrepreneurship Education and Entrepreneurs' Skills. <i>Journal of Entrepreneurship Education</i>, 21(25).</p>	<p>To demonstrate the theoretical relationship between Entrepreneurship Education (EE) and Entrepreneurs' Skills (ES)</p>	<p>i. Review of the skills and how the skills correlated</p> <p>ii. Discuss the impacts of the level of several skills of entrepreneurs which are technical skills, business management skills and personal entrepreneurial skills to the formal educational setting</p>	<p>i. An exercise in decision making and setting goals</p>
<p>Khar Kheng Yeoh (2017).</p> <p>Entrepreneurship Students Distilled Their Learning Experience Through Reflective Learning Log. <i>Journal of Research in Innovative Teaching & Learning</i>, 10(2), 126-142</p>	<p>To analyse written reflections through learning log among students</p>	<p>i. Discuss how writing the reflection affects the learning experience</p> <p>ii. The result showed the treatment group did better in critical thinking and a higher level of reasoning ability than the control group.</p> <p>iii. The impact of reflection on learning performance and self-management</p>	<p>i. Increase critical thinking</p> <p>ii. Impact on the reasoning ability</p>
<p>Mario Franco & Heiko Haase (2009)</p> <p>Entrepreneurship: An Organisational Learning Approach. <i>Journal of Small Business and Enterprise Development</i>, 16(4), 628-641</p>	<p>i. To shed new light on the interface between learning and entrepreneurship.</p> <p>ii. To show how entrepreneurship can be studied as a never-ending, dynamic learning process.</p>	<p>i. Describe learning as a crucial factor in entrepreneurial activity.</p> <p>ii. Discuss a new definition of the entrepreneur (entrepreneur as a learner) and a conceptual model of entrepreneurial learning theory is synthesised.</p> <p>iii. Setting goal, act to the goal, management, and ability to evaluate the strategies</p>	<p>i. To practice the skills</p> <p>ii. Increase students reasoning and critical thinking</p>
<p>Sanchez-Garcia & Jose Carlos (2011)</p> <p>University Training for Entrepreneurial Competencies: Its Impact on Intention of Venture Creation <i>International Entrepreneurship and Management Journal</i>, 7(2), 239-254.</p>	<p>To test the effect of entrepreneurship education programmes on the entrepreneurial competencies</p>	<p>i. Discuss the impact of entrepreneurship activities on students' learning</p> <p>ii. Responsibility for the learning process</p>	<p>i. Increase entrepreneurial competencies</p> <p>ii. Impact on the intention of students</p>

Martha Christianti, Nur Cholimah, & Bambang Suprayitno (2015)	<ul style="list-style-type: none"> i. To explore how learning entrepreneurship was done in early childhood ii. To know whether parents, teachers, and principals support entrepreneurship learning iii. To identify what kind of values of entrepreneurship can be developed for early childhood 	<ul style="list-style-type: none"> i. Applied entrepreneurship learning model and studied the effectiveness of ii. Activities ensure that students are controlling their own destiny, maximising self-potential, planning orientation, increasing continuously quality work, and having the willingness to grab opportunities iii. During activities, students have strategic time management and become innovative 	<ul style="list-style-type: none"> i. Develop self-confidence ii. Become creative and innovative
Development of Entrepreneurship Learning Model for Early Childhood. <i>Asia Pacific Journal of Multidisciplinary Research, 3(3)</i>			
Mohd Nasir Rayong & Abdul Said Ambotang (2016)	To determine the direct and indirect relationship of the factors of imagination, self-motivation and the imagination capability towards thinking skills among Form Six students	<ul style="list-style-type: none"> i. Discuss the influence of entrepreneurship skill on the students thinking skill ii. Awareness of the learning process iii. Choose the right strategies to solve the problem 	<ul style="list-style-type: none"> i. Practice critical thinking ii. Develop thinking and management skills iii. Impact on the student s' self-determination and self-management
Relationship Between Entrepreneurship Skill, Management Skill and Life-Long Learning Towards Critical Thinking Skill Among Form 6 Students <i>Jurnal Kinabalu.</i>			

It can be concluded that in the course of conducting EBSA activities, the skills in managing the sale and entrepreneurship will be practiced. Based on the above, the summary of the skills are:

- i. Character and perspective skills, based on the roles and responsibilities of either the seller or buyer
- ii. Planning and placing goals skills, involving requirements, needs, time and strategy
- iii. Managing trading activities skills, involving the selection of appropriate strategies and ways of action to achieve the goals

- iv. Contingency and initiative skills which involve creativity and flexibility to ensure accuracy and quality
- v. Collaborative skills which involve interaction ability, clarity of presentation
- vi. Reflection skills involve the assessment of the entire process and the findings

The application of these skills will lead to increased thinking and problem-solving skills. In the context of learning, the skills are the basis of self-regulation and are seen as inclined to the development of metacognitive regulation skills. The next analysis table will explain the metacognitive regulation skills in learning.

Table 3: Analysis of Components of Metacognitive Regulation and Related to the Students' Skills

Metacognitive Regulation Components	Student's Skills	References
Planning	i. Study how to learn about topics, laying goals ii. Know the source of information iii. Set some of the strategies that can be used iv. Selecting appropriate and accurate strategies v. Design the assignment/task and the time required for the assignment/task	Schraw & Moshman (1995), Smith (2013), Cera <i>et al.</i> , (2013), Tony Karnain <i>et al.</i> , (2014), Amin & Sukestiyarno (2015), Du Toit & Du Toit (2013) Menz & Cindy Xin (2016), Ackerman & Leiser (2014)
Monitoring	i. Manage time to understand the information ii. Take time to implement strategies iii. Perform selected strategies/ operations iv. Focus on the more important thing, what needs to be done first v. Implement an alternative way if the previous way is ineffective vi. Track on relevant matters which are important to remember	Smith & Mancy (2018) Amin & Sukestiyarno (2015), Adnan & Arsad Bahri (2018), Hasbullah (2015), Du Toit & Du Toit (2013)
Evaluation	i. Reflection of objective achievement ii. Evaluate the level of accuracy of the assignment/task iii. Evaluate the level of achievement / how to answer the question is better than before iv. Make sure new knowledge is in line with the original knowledge	Schraw & Moshman (1995), Amin & Sukestiyarno (2015), Du Toit & Du Toit (2013), Tony Karnain <i>et al.</i> , (2014), Hasbullah (2015), Suriyon <i>et al.</i> , (2013)

The metacognitive regulation component i.e planning, monitoring, and evaluation will be indicators in the learning process. This regulation will influence the work and action of the students in their learning that will affect mastery.

Results and Discussion

The focus of this review is to answer the question of how entrepreneurial activity can conceptually

develop metacognitive regulation skills of students in solving mathematics problems and ultimately master the mathematics concepts. Then it discussed the impact of an activity on the students and the learning of mathematics. In order to gain a link between entrepreneurial skills and buying and selling activities with metacognitive regulation skills, the researcher provides Table 4, the correlations and a summary of Table 2 and Table 3.

Table 4: A meta-analysis of the relationship between entrepreneurial skills and metacognitive regulation skills

Entrepreneurial Skills (EBSA's Phases)	Descriptions	Relevance to Metacognitive Regulation Skills	Impact on the students
Character and perspective skills	i. Responsibility to the characters either seller or buyer	<u>Planning</u> - plan, adhere to learning and goals	Develop self-determination, confidence
	ii. Mind setting according to the perspective of salesperson or customer		Self-belief
	iii. Know what to do		
Planning and placing goals skills	i. Always review the requirements and needs	<u>Planning</u>	Develop critical thinking
	ii. Plan time, cost and material	- Discover the aims, goals - Manage action	Reasoning
	iii. Target and goals to be achieved	- Manage time	Quickly choose a solutions strategy
	iv. Manage available opportunities with skill		
Managing trading activities skills	i. Know when and where according to needs	<u>Planning</u> - Define strategy - Predict what will happen	Increase communication skill
	ii. High communication skills		The problem-solving exercises
	iii. Can predict risk	<u>Monitoring</u> - Set the time - Manage time - Use application strategy	increase problem-solving skill
	iv. Monitor the current level of achievement	<u>Evaluating</u> - Assess current achievement	

Contingency and initiatives skills	<ul style="list-style-type: none"> i. Be wise to take an alternative if something goes wrong ii. Be aware of changes iii. Avoid risk 	<p><u>Monitoring</u></p> <ul style="list-style-type: none"> - Implement appropriate strategies - Do different mistakes - Reduce the error - Monitor achievements <p><u>Evaluating</u></p> <ul style="list-style-type: none"> - Assess the suitability of the strategy - Evaluate the achievement level 	<p>Creative and innovative</p> <p>Critical thinking</p> <p>Apply various solutions strategies</p>
Collaborative skills	<ul style="list-style-type: none"> i. Interaction adapted ii. Delivery clear and with appeal 	<p><u>Planning</u></p> <ul style="list-style-type: none"> - Set the goals <p><u>Monitoring</u></p> <ul style="list-style-type: none"> - Always discuss with certainty <p><u>Evaluating</u></p> <ul style="list-style-type: none"> - Assess accuracy - Discuss results 	<p>Effect on the student's interaction</p> <p>Discussion</p> <p>Sharing</p>
Reflection skills	<ul style="list-style-type: none"> i. Always evaluate the requirements and needs ii. Make a result assessment 	<p><u>Monitoring</u></p> <ul style="list-style-type: none"> - Keep the strategy exactly with the situation <p><u>Evaluating</u></p> <ul style="list-style-type: none"> - Do self-reflection - Review the findings 	<p>Reflection learning</p> <p>Self-reflection</p>
Place	<p>Environment, customer, purpose, the goal inactivity, role inactivity</p> <p>Activity instruction</p>	<p><u>Planning</u></p> <ul style="list-style-type: none"> - Set goal - Know the purpose 	<p>Choose the best strategies</p> <p>Plan learning</p>
Product	<p>Material for presentation, sale, Product presentation</p>	<p><u>Planning</u></p> <ul style="list-style-type: none"> - Define strategy - Know the source - Determine time <p><u>Monitoring</u></p> <ul style="list-style-type: none"> - Implement appropriate strategies - Ensure accuracy 	<p>Creative</p> <p>Excitement</p>

Price	Price adjustment, level, level according to purpose and requirement	<u>Planning</u> - Know the destination - Manage action	Focus on the learning goal Knowing information and learning matters
Promotion	The process of attracting interest, discussing, explaining, arguing	<u>Planning</u> - Set the goals and objectives of the activity <u>Monitoring</u> - Execute the right strategy - Test the strategy - Debug the mistakes - Discuss results <u>Evaluating</u> - Self-reflection - Understanding evaluated	Excitement Engagement Retention by students Increased problem-solving skills Peer teaching

Mantell *et al.*, (2002) stated that buying and selling is a person's cognitive need and is the most basic learning of recognising numbers. Individual cognition can be developed in line with the buying and selling activities. During mathematics learning, when cognitive changes occur, then metacognitive regulation skills are also evolving and this situation will have an influence on students' mastery. Studies by Sanchez-Garcia & Carlos (2011), Christianti *et al.*, (2015), Rayung & Ambotang (2016) and Rahmawati (2017) reported that cognitive needs lead to changes in self-esteem and self-management for the better. Entrepreneurship is also one of the examples of individual social skills and this experience is needed as a learning base (Jaslinah, 2012). Almahry *et al.*, (2018), Khar *et al.*, (2017), and Franco and Haase, (2009) explained in their study that through the activities of buying and selling, students' communication improves and affects the mathematics learning process. These collaborative skills will enhance students' metacognitive experiences. This experience will form a temporary framework and will be updated with new experiences during learning process.

According to Palmer and Johansson, (2018), and Rahmawati (2017) entrepreneurship competence involves thinking skills, i.e. skills to analyse needs, comparative differences, and so on to buy or sell something. This skill when applied in the classroom along with mathematics problem solving will train the students' metacognitive regulation skills. The ability to coordinate problem-solving in learning by way of entrepreneurship and playing the roles of seller or buyer will have an impact on mathematics learning by developing metacognitive regulation skills. According to Goh (2010) experience and needs as a seller or buyer is are effective because they test how to think, organise, manage and take initiative or alternative to solve the problem during an activity and learning mathematics. Researchers such as Almahry *et al.*, (2018), Khar *et al.*, (2017), Franco and Haase, (2009), Christianti *et al.*, (2015), and, Rayung and Ambotang, (2016) reported that entrepreneurial, buying and selling activities can enhance student thinking competencies. This indicates that many researchers involved in this study support that metacognitive regulation skills, creative and critical thinking skills develop

simultaneously while doing these activities. In addition, through entrepreneurial skills, buying and selling activities, effective interaction is highly encouraged and this will contribute to the growing aspects of metacognitive regulation skills of students as explained by Adnan and Arsad Bahri, (2018) that is, the students' metacognitive regulation skills are very influential when they can be created during active learning. In active learning, interaction can encourage students to give and share ideas and develop positive behaviours to learning such as concentration, excitement and so on. In the interaction process, when students are aware of the level of previous knowledge, they will manage their thinking by planning, monitoring and evaluating current learning (Franco & Haase, 2009; Khar *et al.*, 2017; Almahry *et al.*, 2018). The real interaction is when students can communicate with their minds through the process of self-metacognition. This process will contribute to the mastery of mathematics. This has been discussed and evidenced in studies that investigated on how metacognition and student achievement correlated (Du Toit & Kotze, 2009; Hasbullah, 2015; Amin & Sukestiyarno, 2015; Menz & Cindy Xin, 2016; Ibrahim & Iksan, 2017; Herlina *et al.*, 2018).

Conclusion

The present study reviewed the implementation of entrepreneurship, buying and selling activities as a study input targeted at mathematics learning to see the output. In summary, this study can illustrate that the implementation of EBSA can alter the scenario and give re-branding to learning. The contribution to this study was to provide knowledge on the influence of metacognitive regulation and interaction skills in pursuing mathematics learning. Additionally, this study also contributes knowledge of mathematics learning directly. Mathematics is a unique, abstract and complex knowledge that requires mental adaptation and various skills. This study reinforces the statement that learning mathematics requires the mathematical medium itself. An example is a trading activity,

which is also one of the areas of mathematics. Thinking mathematically is the best way to learn mathematics. This study has also clarified the concept of transversal competence and multi-literacies, which combine various competencies to explore other competencies. It also shows a combination of strategies and methods of learning. So, to ensure that the knowledge continues, further studies can be conducted by focusing on other skills to apply in mathematics learning, for example, creating and designing skills. Besides that, this study can also be further developed by producing more specific teaching models or developing modules, aids, tools, mobile apps, and software.

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Abbreviations: EBSA: Entrepreneurship, buying and selling activities

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