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Defining the Collaborative-Constructivism Based Learning and Teaching Approach in Malaysian Primary Schools in Supporting the Hybrid Learning of Visual Arts Education: A Fuzzy Delphi Method Study

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ABSTRACT

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Education in Malaysia has undergone transformation and reformation over decades to meet contemporary needs. In the era of Industrial Revolution 4.0 (IR4.0) has brought direct impact to the field of education, as a steppingstone for generating future workforce. To meet these demands, 21st century learners who have the potential to shape a competitive future nation by possessing 21st century skills: critical thinking, creativity, collaboration, and communication. Therefore, the transformation in learning and teaching practices is necessary following the rapid development in information, communication, and multimedia technology. Even now, Malaysian mainstream educators continually report that they need better understandings and knowledge to be proficient in supporting individualized, personalized, and differentiated learning to stimulate the improvement of learner-centred learning, not the traditional teaching and learning process with teacher-centred. This study upholds a new defining on current learning and teaching practices-based collaborative and constructivism in supporting hybrid learning of Visual Arts Education (VAE) to improve the quality of learning and develop learners holistically equipped with 21st century skills needed in this century. This study focuses on utilizing the Fuzzy Delphi method to achieve a consensus on the elements of hybrid learning practices based on the theories of collaborative and constructivism for VAE. The findings identify a comprehensive and clearer framework for the educators with a guideline covering the learning outcomes, learning contents, delivery strategies and forms of assessment that are key for educators in hybrid learning practice for VAE. It offers a versatile judgement, clearer framework, and better structured prospect to help facilitate learning process for the learners to enhance their knowledge and skills, and competencies, as well as help the educators have better readiness and clearer role alignments.

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1. Introduction

Visual Arts Education (VAE) is a subject cross the curriculum as a basis for other subjects which is involving the process of producing works for the purpose of giving students an opportunity to cultivate their interest, personality, creativity, and sensitivity to the environment [1]. The curriculum of Visual Arts Education in Malaysia often runs into changing from time-to-time, and it is being evaluated or re-examined in parallel with the current needs. The evaluation and revision on the curricular aims to further improve the existing curricular to bring out students who can apply their knowledge, skills and values learned from the designed modules in the curricular [2]. Teachers as the implementers of the curricular play a crucial role in shifting the curricular towards a positive direction to realize the aspiration of the Ministry of Education in Malaysia in developing intellectuals and generating artistic intelligence among the young generation to produce creative students.

Visual Arts Education is a subject that requires various special equipment or facilities in every learning and teaching process [3]. Unlike other subjects, the learning and teaching process of Visual Arts Education emphasizes development in terms of skills and techniques for the artworks production among the students that require equipment and space to produce an art project or artwork. However, most teachers are not good at handling the Visual Arts Education class due to shortage of knowledge and unfamiliar concepts related to visual arts. Under these circumstances, they are less adapting appropriate teaching approaches to optimize the effectiveness of the VAE class. Accordingly, the phenomenon of achieving the learning and teaching objectives of VAE class is underrated. Smart teachers using appropriate teaching approaches are able to attract student's interest whereas teachers fail to attract students' interest in teaching will make them feel bored and some students especially who are weak on performance in terms of academic achievement or who have communication problem might feel marginalized [4].

In accordance with Adin and Arshad [4], the adequacy of qualified and trained teachers in the field of VAE is a factor that causes less creativity in the process of teaching and learning. The focus of some teachers is also different as they are not specialized in VAE and consider VAE to be not a core subject. Teachers are the role models for other individuals to bring students towards a positive attitude and engagement towards the subject they learn. On this account, teachers play an important role in every subject, and they need to be knowledgeable to attract students' interest and be able to unearth students' creative potential through teaching and learning process in the classroom [5]. The main goal of VAE is to enable students to focus on listening and observation actively and make the words between the arts they learn with other disciplines and finally they can appreciate and feel grateful to the beauty of God's creation [6].

There are various parties and agencies in education that emphasize the purpose of teaching and learning is to provide students with knowledge and skills, and even providing them with the real-life experience through the learning process including the VAE [6]. Therefore, the wisdom of a teacher in the process of selecting and preparing learning and teaching materials and approaches is important to provide an effective learning environment. In this case, the phenomenon of learning and teaching that allows students to actively participate in the learning process could help them gain a rich and diverse experience.

In parallel to the rapid development of technology, Information and Communication Technology (ICT) and education are inseparable. The role of technology in the learning system is emphasized with the intention of launching a technology-enriched learning and teaching system [1]. The use of technology also eases the burden among the teachers [7] especially among the non-optionist teachers who are less skilled in the subject matters which are not their own specialization, and they

could confront troubles in the process of preparing materials and facilitating for the purpose of effective learning.

The introduction to technology on e-learning is the beginning point of changing the educator's role as a facilitator in the knowledge transformation process and not only as a knowledge deliverer. In this process of transformation, teachers are advised to adjust the pedagogical model in accordance with the latest educational paradigm to improve the quality of learning. Reconsideration of the role of an educator needs to be taken in the aspect of innovative approaches to adapt learning to the latest technology and maximize the value of technology in education to refine the learning process and encourage students' engagement and motivation. A structured learning environment and activities help students building sensory experience through exploration, experimentation, and observation in purpose to increase awareness and understanding towards description and explanation on abstract concepts surrounding us clearly and comprehensively [8].

In spite of this, based on preliminary analysis studies [9], there are 70% of students who are not prepared with the necessary tools and materials during online learning through video conferencing has prevented the development of students' meaningful experience and understanding directly through virtual interaction with teachers. This phenomenon is also a factor of misunderstanding from teacher's delivery on learning content, especially in terms of the knowledge and skills of the fundamental of design. It is supported by the term collegial pedagogy of Chávez and Seop [10] in the collaborative work production session that art educators not only handle learning through instruction but also need to involve the learners in the children's creative space to improve their understanding in the aspect of skill application in arts and the processing of ideas on their artwork production.

The main principles of KSSR which is an acronym for *Kurikulum Standard Sekolah Rendah* or Standard Curriculum for Primary Schools (SCPS) in English is based on learning standards that require students to achieve pre-set standards covering knowledge, skills, and values in certain subjects in a period for different levels of their schooling [13]. The teaching and learning strategy in KSSR of VAE includes the concept of integration and the application of science and technology, especially in the field of music and artwork, aspects of exploration and creativity. However, it is disputed that the student-centred teaching and learning strategy adopted in Malaysian education that emphasizes the development of skills and the value of their knowledge still brings pressure and conflict among teachers and students [14-17].

The aspect of 21st century classroom culture is emphasized, and it is an initiative identified as essential in changing the curriculum and the role of the classroom to ensure the delivery of contents and skills among students effectively. This transformation requires the efforts of teachers in teaching and management strategies in order to ensure the effectiveness of classroom management functions [11,12] which can stimulate cooperative and collaborative learning as well as competitiveness among the students. However, referring to past studies, in terms of contextual gaps, existing studies are related to digital technology in the learning process, innovative and culture, the effectiveness of technology assisted approaches based on collaboration, and ICT-assisted pedagogical capacity in the learning and teaching process, focused on core subjects, higher institutions, secondary schools and in developed countries [18-21]. Local research related to digital technology in education has been carried out at various levels including secondary schools and higher education institutions. In local context, the research involving digital technology in improving the effectiveness of learning and teaching process in VAE subject and fostering a culture of innovation and creativity are adequacy. Subsequently, the main goal of this study is to develop a new framework to fit the classroom with digital technologies in a hybrid learning environment among the primary schools to improve the quality of learning process in Visual Arts Education.

2. Theoretical Framework

The following framework provides a frame of reference for how the concept of hybrid learning based collaborative and constructivism approach as a learning and teaching practices for VAE subject, and the proposed learning outcomes, learning contents, delivery strategies and the form of assessment are interrelated to improve learning in the form of individualization, personalization, and differentiation, as well as ensure a holistic development among the learners. This framework challenges the current conceptualization, and approach of standard curriculum and learning and teaching practice in Malaysia. In that case, learning and teaching practice is not only taking place in the physical environment but proposes to new defining on hybrid learning with online learning environment and physical environment are synchronized to optimize the effectiveness of learning community and constructive learning to ensure the learners are taking accountabilities on their own learning.

Figure 1 illustrates the framework of this study as a hybrid learning and teaching process based on theories of collaborative and constructivism and the flow of operations in practice of hybrid learning and teaching. This framework involves educational changes in different aspect including the role of the learners in the learning process, the role of an educator in the process of facilitating and managing the learning and teaching process, providing a suitable learning environment for educational needs, as well as establishing a space for the learners involve in collaboration with peers in a community to share the role of learners in the learning at school. Based on the proposed *EasySeni* framework, the learning activities can be divided into three main parts:

- i. orientation
- ii. learning and teaching approach
- iii. general knowledge of technology in Visual Arts Education applied in the hybrid learning and teaching of *EasySeni*.

Accordingly, there are several main features in the process of learning and teaching that are proposed using the *EasySeni* learning approach as following:

- i. "Virtual Teacher" is created in a developed learning platform to deliver basic learning content with video demonstration, gamified simulation, and assignments with different challenging levels to create a more interactive virtual learning and constructive learning environment with instructional scaffolding provided.
- ii. A "Graphic Learning Map" that is appropriate and aligned with the target level and curriculum is provided and it is an approach to include all learning concepts and learning gaps into a road map that requires learners to complete the journey of learning individually. Learners can choose different paths that include various learning contents for the learners to master the aspects of knowledge and skills in VAE subject.
- iii. At the end of the chosen learning topic, various activities and questions are prepared to assess the learners' level of understanding. If learners are having difficulty with a concept, the algorithm will detect and guide them to review and repeated learning of the topic with a more basic concept before continuing their journey to more difficult activities until the learners successfully master the concept.
- iv. An assignment needs to be completed by the learners by producing a product or an artwork through a problem-solving process and producing a creative and innovative artwork or product collaboratively or individually.

The artworks and products created by the learners are also exhibited for the session of an online art critique. A virtual gallery was established for the purpose of displaying learners' artwork. Art criticism can be carried out through message room by the learners and interaction with the educator on the platform of virtual gallery.

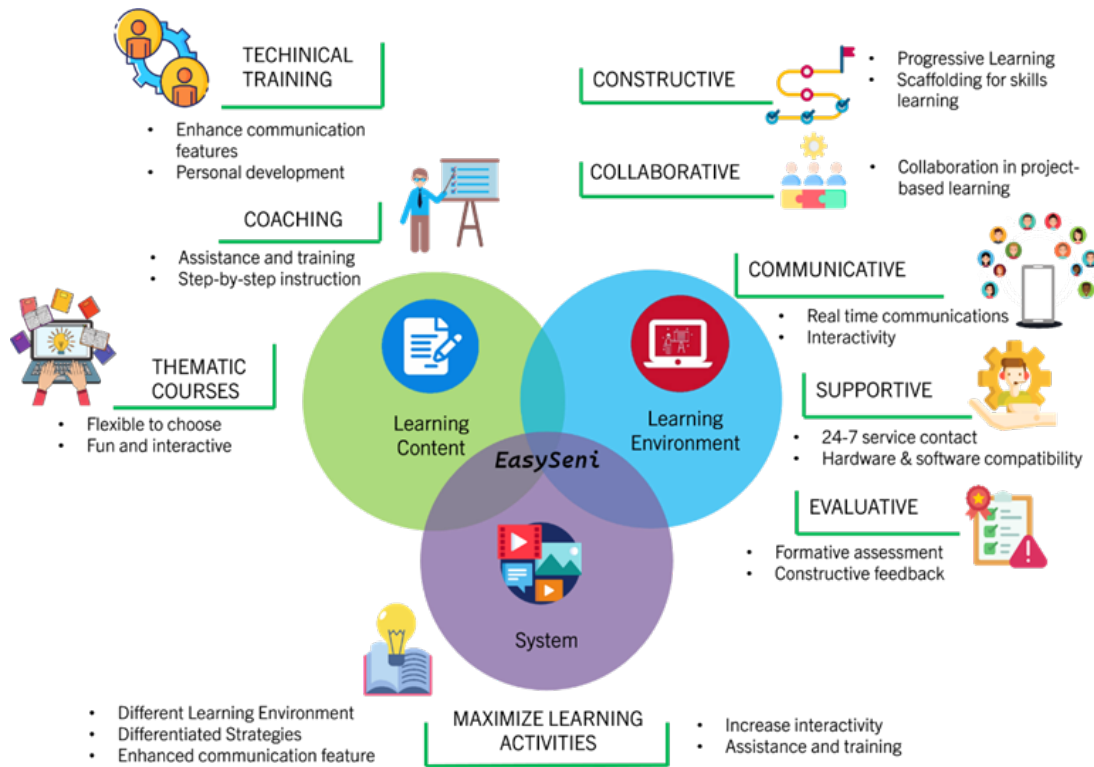


Fig. 1. Elements of hybrid learning in EasySeni

The hybrid learning process in EasySeni is conducted through both an online learning environment and face-to-face physical learning environment through the learning platform developed. Accordingly, the learners can access VAE subject learning anytime and anywhere. The educators can also apply the EasySeni approach in the form of flipped classroom to overcome the issue of time constraint in the learning process taking place in classroom by providing an EasySeni self-learning platform for the learners. In the process of delivering learning content, a 'virtual teacher' appears and a space for providing feedback (instant messaging function) is provided to support learners who face problems during the learning process.

Pedagogy that emphasizes student-centred teaching and learning includes a project- and activity-based learning approach, collaborative and constructivist hybrid learning. The learning system developed in this study is based on the EasySeni learning and teaching framework adapted from the Community of Practice learning model which is based on Web 2.0 technology [22]. This system is developed by creating five ideal learning environments proposed in the model covering

- i. communicative partnership by creating a knowledge sharing site in a community and group members in the domain [37]
- ii. a collaborative environment involving members gathering and engaging in joint activities or activities through interaction processes such as virtual art gallery projects in modules)[37, 38]
- iii. a constructive and supportive environment by creating a Virtual Teacher, the insertion of widely related information exploration elements in the developed online learning system

- as well as creating a mutual assistance and guidance zone from friends and teachers from time to time during the learning period [38]
- iv. assessment environment by creating formative and summative assessment throughout teaching and learning in modules through work production projects, quizzes and exercises as well as gamification elements as motivation for students to continue moving from unit to the next learning unit [39].

Thoroughly, transformation in learning and teaching process in VAE subject with a more comprehensive guidelines on the implementation of hybrid learning and teaching by integrating the elements recommended for 21st century learning through this proposed framework by defining the learning based on theories of collaborative and constructivism as a starting point to develop a new vision in education to improve the quality of learning and teaching practice especially in the learning of VAE subject.

3. Research Objective

This study aims to develop a newly proposed model for learning and teaching in Visual Arts Education, named Collaborative and Constructivism based Hybrid Learning Model (EasySeni Model) based on expert consensus. The hybrid learning model was developed to be used as a guide to build a teaching and learning module by integrating a collaborative and constructivism approach with the aid of information technology, communication, and multimedia to increase the active engagement of students. In addition, the modules built based on the hybrid learning model developed function as an alternative to teacher teaching and provide an online sharing platform for various parties to access information easily. Elements of collaborative-constructivism of hybrid learning in VAE that should be included into the guideline in order to enhance the current VAE learning and teaching process, utilizing the Fuzzy Delphi method.

4. Methodology

The current study emphasizes the development of the model and the validation of the model explained by Richey and Klein [23] that the instructional design model can be developed through theoretical or practical methods or both methods. The implementation of this design and development study applies a combination of quantitative and qualitative through the application of the Fuzzy Delphi Method (FDM). This study implemented the FDM to generate consensus opinions and agreement on elements of the needs of collaborative, constructivism and technology-assisted learning environment in the learning and teaching process of VAE to improve learning outcomes and the quality of primary school students' artworks. Accordingly, this study involves two main phases, namely the first phase of the exploration phase of learning and teaching strategy elements that can improve the quality and creativity of students in the process of artwork production based on literature review and interviews. Then the researcher proceeded to the second phase which is the phase to obtain experts' agreement through the application of FDM.

4.1 Research Design

The FDM is a technique that combines the Delphi method and fuzzy set theory [24]. FDM is applied to obtain experts' agreement to determine the needs of the appropriate elements in the design as well as the sequential organization of each item in the elements of EasySeni Model. In the

context of this study, the research applied the Delphi technique to design an EasySeni model based on collaborative and constructivism approach and assisted by information technology, communication and multimedia in the learning and teaching process of VAE. The Fuzzy Delphi technique applied in this study is a simplified method from the Delphi technique in order to

- i. reduce the traditional Delphi round
- ii. reduce the issue of ambiguity regarding a matter related to elements and information content
- iii. guarantee the completeness of consistent opinions
- iv. avoid the issue of leakage and loss of data from researchers and against a group of experts in a study; and (v) not misinterpreting the original opinion of experts and giving a picture of their real response [25].

The Fuzzy Delphi technique usually involves quantitative methods [26], but many studies also reported using qualitative methods such as Ismai, Kamis, Alwi and Kob [27] supporting the Fuzzy Delphi process is also suitable to be applied using qualitative methods. In the context of this study, Fuzzy Delphi technique applied to obtain experts' agreement in order to meet the needs of the appropriate elements in the design and identify the organization and sequence of each item in the EasySeni Model. This method involves a combination of the Fuzzy Numbering Set and the Delphi method. The Fuzzy Delphi technique was carried out to show the Threshold value (d) in quantitative form [22].

Referring to Ghazali Darusalam and Sufean Hussin [28], the fuzzy value is from 0 to 1 through a comparison between the 5-point Likert scale and the Fuzzy scale based on the scale level as in Table 1. Referring to Table 1, it is explained that one of any scale in the Likert scale selected by an expert panel will be translated in the Fuzzy scale to three values or levels. Each level includes three values:

- i. minimum value (m1)
- ii. the most reasonable value (m2)
- iii. the maximum value (m3) with a Fuzzy interpretation for each value in the selection between scales 5, 4, 3, 2 and 1.

Table 1

Linguistic variables

Level of Agreement	Score	Fuzzy Scale
Strongly Disagree	1	(0.0, 0.0, 0.2)
Disagree	2	(0.0, 0.2, 0.4)
Moderately Agree	3	(0.2, 0.4, 0.6)
Agree	4	(0.4, 0.6, 0.8)
Strongly Agree	5	(0.6, 0.8, 1.0)

4.2 Sampling and Experts

The panel of experts involved in this study is 25 experts who were selected through purposive sampling according to their expertise in various field consisting of five expert categories such as

- i. teaching models
- ii. online learning
- iii. instructional design

- iv. instructional technology
- v. Visual Arts Education

A total of 25 experts has theoretical expertise and practical experience in the process of designing online learning and teaching were involved in this study. Purposive sampling is the most suitable approach utilized in FDM to obtain experts' opinion and consensus agreement on an issue of this study. The number of experts selected is appropriate as stated by Hasson *et al.*, [29], 10 to 50 people are sufficient if there is a level of uniformity or homogenous. Table 2 shows the number of experts with their expertise selected in this study.

Table 2
 Respondents for the Fuzzy Delphi method (N=24)

Category	Position	Institution	Working Experience	Total Expert(s)
Specialist	Associate Professor	University	20 years >	2
	Senior Lecturer	University	15 years >	4
	Lecturer	Teacher Training Institute	10 years >	3
Mainstream Educators	Master Trainer	Primary School	10 years >	3
	Course Leader	Primary School	15 years >	5
	Excellent Teacher	Primary School	10 years >	2
	Subject Teacher	Primary School	5 years >	5
School Administrators	Senior Assistant	Primary School	10 years >	1

4.3 Instruments

The items in the survey questionnaire for the Fuzzy Delphi method are built based on review of literature which is relevant to the scope of this study, views and experiences, and interview with the panel of experts. In the context of this study, the Fuzzy Delphi study begins with utilizing the literature highlights to involve the experts in an in-depth interview to obtain the necessary indicators that may be relevant to the dimensions of this study. After the indicators and dimensions were identified through in-depth interviews, a set of survey questionnaires was built using a 5-point Likert Scale. The 5-point Likert Scale linguistic variables were converted into Fuzzy scale values shown in Table 1. The survey questionnaire was designed to determine the consensus views and agreements on the elements in learning and teaching practices based on theories of collaborative and constructivism in hybrid learning environment which including online virtual learning and face-to-face physical learning environment, as stated in the framework of this study. Within the hybrid learning process, there were four dimensions involved including

- i. the learning outcomes
- ii. learning contents
- iii. delivery strategies
- iv. forms of assessment.

4.3 Data Analysis

Data analysis is based on Fuzzy Triangular Numbering which aims to obtain the Threshold value (d). The process of identifying the Threshold value (d) is a very important process to determine the level of agreement among the panel of experts. The condition to obtain experts' agreement for each item is that the Threshold value (d) does not exceed or equal to 0.2. If Threshold value (d) does not exceed or equal to 0.2, it is considered that the experts' agreement has been achieved [30]. The

vertex method will be utilized to calculate the distance between the average of each Fuzzy number $m = (m_1, m_2, m_3)$ and $n = (n_1, n_2, n_3)$.

Apart from the Threshold value (d) as a condition for obtaining experts' agreement, the second condition is to determine the percentage value of experts' agreement that overall agreement (group consensus) must exceed 75% for each item, the second round will be run again if the percentage value of the experts' agreement does not exceed 75% [31]. The following step is the defuzzification process. This process is a step to analyse the data using the average of Fuzzy numbers to obtain the value of Fuzzy score (A). The value of Fuzzy score (A) must be greater than or equal to the median value (α -cut value) which is 0.5 [31] which indicates that the element is accepted by experts' consensus. The function of the Fuzzy score value (A) is to determine the position and priority of an element according to the consensus on view of experts. The following are three types of formulas involved in the process of obtaining the Fuzzy score value (A) to determine the defuzzification process:

- i. $A = (1/3) * m_1 + m_2 + m_3$
- ii. $A = (1/4) * m_1 + m_2 + m_3$
- iii. $A = (1/6) * m_1 + m_2 + m_3$

The α -cut value is the median value between Fuzzy numbers ($0 - 1$), with the minimum α -cut value reaching 0.5. Measured constructs or items can be modified based on the agreement of experts in the study if the α -cut value is less than 0.5.

The priority or ranking of a construct or item can be determined through two processes namely Average Response and Fuzzy Evaluation. The level of each item can be accepted through the agreement of the experts panel which needs to exceed 75% based on the value of the defuzzification score (Average of Fuzzy Number or Average Response. In the process of determining priority of item through the defuzzification process, the defuzzification value based on experts' agreement and the construct or item with the highest value is ranked in priority [32]. Table 3 illustrates the steps in implementing Fuzzy Delphi Method.

Table 3
 Steps in implementing Fuzzy Delphi Method

Step	Formulation
1. Expert selection	A total of 24 experts were used in this study. The experts based on their areas of expertise were invited to determine the importance of the evaluation criteria on the variables to be measured using linguistic variables.
2. Determining linguistic scale	Covert all the linguistic variables into number of fuzzy triangles (triangular fuzzy numbers) in this process. Triangular Fuzzy Number which is represented by m is made up of the value of m_1 (the value of minimum or smallest value), m_2 (most reasonable value or most plausible value) and m_3 (maximum value). Figure 2 shows the Triangular Fuzzy Number in the graph that all three of these values is in the range of 0 to 1 which are coincided with fuzzy numbers. The Triangular Fuzzy Number is used to produce Fuzzy scale with the purpose to translate linguistic variables into fuzzy numbers.

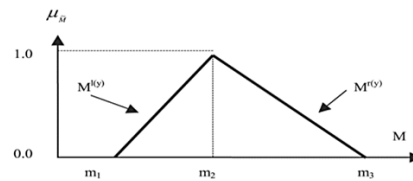


Fig. 2. Triangular fuzzy number

3. The determination of linguistic variables and average responses
4. The determination of threshold value 'd'

After the Likert scale data obtained, researcher needs to turn all measurement results into Fuzzy scales as a process to acquire recognition of each response.

The threshold value is important in the process to identify the level of agreement among the experts. To obtain experts' consensus on every item, the first condition is to determine the threshold value 'd' ≤ 0.2 with the following formula:

$$d(\tilde{m}, \tilde{n}) = \sqrt{\frac{1}{3} [(m_1 - n_1)^2 + (m_2 - n_2)^2 + (m_3 - n_3)^2]}$$

5. Identify the alpha cut aggregate level of fuzzy assessment

The value of α -cut is the value of median between fuzzy numbers [0] and [1] and can be used in the process of defuzzification. If the score value f Average of Fuzzy Number or Average Response is more than 0.5, means that the construct or item measured can be accepted based on expert consensus, instead if the value is less than 0.5, then the construct or item measured should be rejected.

6. Defuzzification process

The second condition for Triangular Fuzzy Number is to involve percentage of expert agreement through defuzzification process using the formulas:

- i. $A = (1/3) * m_1 + m_2 + m_3$
- ii. $A = (1/4) * m_1 + m_2 + m_3$
- iii. $A = (1/6) * m_1 + m_2 + m_3$

A-cut value = media value for '0' and '1', where α -cut value = $(0+1)/2=0.5$. If the result A value is less than the α -cut value = 0.5, the item will be rejected, and it does not indicate an expert agreement.

7. Ranking process

A process to determine elements based on defuzzification values that are based on expert consensus, to decide the element with the highest value.

5. Findings

The Fuzzy Delphi instrument was developed using an in-depth interview technique that was conducted involving 10 experts from various fields to obtain experts' views on the formation of the Fuzzy Delphi questionnaire instrument in the first round of FDM. In-depth interviews were conducted by gathering ten experts from various fields. In the first round, qualitative data analysis of the Delphi study has found a total of 186 items for the elements of the hybrid learning model based on collaborative and constructivism approach for VAE subject at school. The findings from the interviews were transcribed and organized according to six main themes in the development of models including the learning outcomes, learning content, delivery strategies, learning activities, forms of assessment and the appropriate types of devices and application for the learning and teaching process of VAE subject. Consequently, these items were grouped according to their respective dimensions, aspects, and themes.

The analysis stage in the second round of Fuzzy Delphi is divided into seven main parts covering

- i. determination of experts and the number of experts involved

- ii. linguistic scale selection
- iii. get the average value
- iv. determine the Threshold value (d)
- v. obtain experts' consensus greater than 75%
- vi. get Fuzzy Evaluation value
- vii. the process of determining the defuzzification score.

Further, Table 3 summaries the findings on the items of three aspects in the learning outcomes of hybrid learning and teaching process-based collaborative and constructivism approach for VAE subject. Based on the findings, all items are granted agreement and accepted into the final guideline with a good consent value for meeting the requirements of learning outcomes for hybrid learning and teaching process-based collaborative and constructivism approach for VAE subject. All items in EasySeni hybrid learning had a threshold value (d) below 0.2 ($d \leq 0.2$), and percentage of consensus agreement was greater than 75%. This also indicated majority of experts agree to accept all the items in the dimension of learning outcome of EasySeni.

Based on the results, the experts seemed to place high importance for students exploring the production of combination of collage and *Gurisan* in the field of drawing from the aspect of visual art language, various of media as well as techniques and processes as learning outcome in the aspect of knowledge under the theme of curriculum and subject matters for EasySeni hybrid learning. The experts ranked high importance for students realizing the importance of effectiveness communication to influence the learning community for support as learning outcome of EasySeni hybrid learning in the aspect of knowledge under the theme of learning community. There was also high consensus from the experts that the students are able to identify appropriate information and communication technology applications to find additional learning information as learning outcomes of EasySeni hybrid learning in the aspect of knowledge under the theme of ICT.

Meanwhile, the experts placed importance for students are able to do appreciation to the heritage art and connect the visual art with other disciplines, life, and career as the learning outcomes in the aspect of skills under the theme of curriculum and subject matters. It was also deemed important for students to be able to use a variety of resources and technology appropriately to practice collaborative with peers effectively as the learning outcomes in the aspect of skills under the theme of learning community. For the students using appropriate ICT applications to search for additional learning information, findings indicated that all items were accepted for meeting the requirements as the learning outcome in the aspect of skills under the theme of ICT. There was high consensus from the experts that one of the learning outcomes in the aspect of learning attitude included producing students with highly competitive in personal domain, giving birth to students who love knowledge in learning attitude domain, as well as producing students who communicate effectively in social domain.

The findings on the items of two aspects in the learning content of hybrid learning and teaching process-based collaborative and constructivism approach for VAE subject. For the theme of language of visual arts, skills of art, information and communication technology, and generic skills, findings supported that all the items were accepted as learning content of EasySeni hybrid learning in the aspect of knowledge and skills. Findings showed that the threshold values (d) were less than 0.2 ($d \leq 0.2$) and the percentage of experts' consensus exceeded 75%. The defuzzification values of all 23 items were relatively high with most α -cut values exceeding 0.75. On the other hand, the experts placed importance for the personality development and professional domain as parts of learning content of EasySeni hybrid learning in the aspect of learning attitude to cultivate students' independence and accountability on their learning.

The findings on the items of all three aspects of delivery strategy in EasySeni hybrid learning for VAE subject including the training, learning community and individual learning. Based on Table 6, all items were granted with an agreement and accepted as the final guideline of delivery strategy of EasySeni hybrid learning with high approval. All items in the dimension of delivery strategy had a threshold value (d) below 0.2 ($d \leq 0.2$) and the percentage of consensus agreement was greater than 75%. This also proved that the experts agreed on all the items in the dimension of delivery strategy of EasySeni hybrid learning for VAE subject. Based on the results, the experts ranked high importance for providing virtual teachers to provide help and guidance for students choosing topics according to their respective mastery levels, providing opportunity for students to engage themselves actively through simulation, and involving students in lesson study to discuss with peers in a scientific form and planning the work to complete an assignment or project as the delivery strategies under the theme of training. The experts seemed to place high importance for identifying individual competence through students' performance in group learning activities, creating a virtual gallery for students to share their artworks, and involving themselves in art criticism, and mentoring pupils to accept other's views as the delivery strategies under the theme of learning community of EasySeni hybrid learning. It was also considered important for identifying the competence of students through individual learning.

The findings of three themes of assessment forms in the process of EasySeni hybrid learning for VAE subject based on the process of assessment including before, during and after assessment. Based on the findings, all items were accepted as forms of assessment. Findings showed that the threshold values (d) were below 0.2 ($d \leq 0.2$) and the percentage of experts' consensus surpassed 75%. The defuzzification values of all 23 items were also relatively high with most α -cut values exceeding 0.75. Based on the results, the experts seemed to place high importance for analysing students' performance through the progress bar in their personal profile and assessing students' level of performance through diagnostic test in the form of game before the learning process and implementing online quiz during the learning process. The experts ranked high importance for a brief presentation from students of their own artworks, students' success is recognised by school, physical or virtual monitoring of students' learning process, and using online methods to collect information of the effectiveness of the learning process after the learning process.

Table 4
 The final framework of EasySeni hybrid learning based on collaborative and constructivism approach

Dimension	Final elements
Learning Outcome	Aspect of Knowledge and Skill
	• Curriculum and subject content
	• Learning community
	• Information and communication technology
	Aspect of Learning Attitude
	• Self-domain
Learning Content	• Domain of learning attitude
	• Social domain
	Aspect of Knowledge and Skill
	• Language of visual arts
	• Arts skills
	• Information and communication technology
Delivery Strategies	• Generic skills
	Aspect of Learning Attitude
	• Personality development
	- Self-domain
	- Professional domain
	• Training
	- Demonstration
	- Simulation
	- Culture of collaborative and sharing
	• Learning Community
	- Group learning
	- Personal practice sharing
- Mentoring	
Assessment Forms	• Personalized Individual Learning
	• Pre-Assessment
	• Assessment During Learning
	• Post-Assessment
	- Students' artwork and performance
	- Student personal portfolio
	- Observation
- Questionnaire	

6. Discussion

In this study, the FDM was utilized to develop the framework of EasySeni hybrid learning based on collaborative and constructivism approach for VAE subject at school. There are 5 dimensions, namely learning outcomes, learning contents, delivery strategies, learning activities and form of assessment. By studying the elements of collaborative and constructivism in supporting the hybrid learning for VAE subject, this study aimed to provide a clearer illustration to the educators in term of the learning outcomes, contents, activities, delivery strategies and form of assessments in supporting hybrid learning for VAE subject. Furthermore, improving the current guideline for learning and teaching process in VAE proposes a new define to educators to have a comprehensive guideline and clear flow of operating in hybrid learning and teaching process for VAE subject, which could further enhance the readiness and positive attitudes of educators in the process of learning and teaching based on collaborative and constructivism approach. Figure 3 shows the EasySeni framework model output.

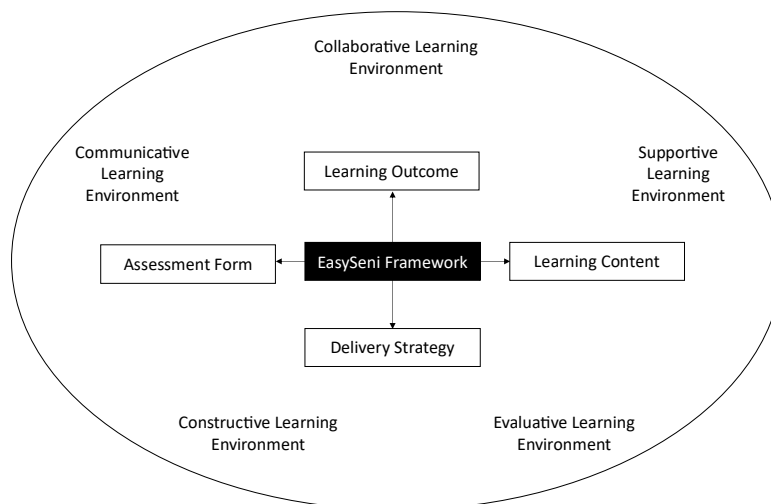


Fig. 3. The EasySeni Framework Model output

6.1 Learning Outcomes

According to the findings of this study, the experts believed that the clarity of the learning outcomes of hybrid learning and teaching based collaborative and constructivism for VAE subject (EasySeni) ensures that the goals of EasySeni are fulfilled. On this account, each learning outcome in EasySeni should be able to describe the desired behaviour, how the behaviour is operationalized and evaluated. In parallel with the statement, the findings of this study found three aspects that make up the learning outcomes dimension of EasySeni, involving the aspect of knowledge, skills and learning attitudes. The panel of experts in Delphi study agree that the three aspects can meet the main goals of EasySeni, which are the aspiration of educators, learners, and the community. As El-Kogali, El Tayeb, and Krafft [33] stated, the selection of learning outcomes of a learning and teaching process needs to coincide with the aspiration of the stakeholders in education, including educator's wish to know something, the vision set by the educational organization, the necessity of society wish to achieve, and the goals set by experts regarding the importance of a particular field. Learning outcomes play a crucial role in assessment and evaluation, determining the learning content and activities, as well as making clear what the learners need to know and acquire after a completion of learning activity. Accordingly, the learning outcomes of EasySeni should be formed by considering the aspects of knowledge, skills, and attitude to create a comprehensive and clear guideline towards the delivery strategies and the form of assessment to improve students' development holistically. Before planning and implementing the learning activities, educators is ready and equipped with a framework on how to conduct an effective learning and teaching process to meet its goals based on the learning outcomes illustrated in term of delivery strategies, instructional resources, and materials as well as the form of assessment. In the aspect of knowledge, the proposed learning outcomes were illustrated according to the curriculum and subject content covering all the theories, concepts, and exemplary on visual arts.

6.2 Learning Content

The result of Delphi experts' agreement found three aspects that need to be given priority in forming the learning content of EasySeni covering the aspects of knowledge and skills as well as the aspect of learning attitude. The learning content describes resources applied to develop the knowledge and skills that enable individuals to perform their roles better and change towards

positive behaviour. In parallel to the learning outcomes, the learning contents are designed based on individual's development in those three aspects. In the aspect of knowledge, the learning contents relate to the concept and basic knowledge of visual arts covering language of visual arts including the element of visual arts and the principles of design, as well as the fundamental concept of artwork production through a variety of skills of visual arts. To achieve the learning outcome enabling the learners engage actively in a learning community, the learning contents of EasySeni also covers a comprehensive guideline on flow of operations to apply related knowledge for the purpose initiating effective communication and establishing a friendly relationship with peers in a learning community. A learning community is effective to create a small group of learners who share common goals and work together collaboratively in classroom or virtually [34]. In the context of this study, the proposed learning contents under the theme of learning community, is affiliating the application of ICT to realize an ideal hybrid learning situation where the learners able to know how to select appropriate ICT application for their learning, and how to manage the virtual educational resources and ICT equipment to maximize the effects of virtually interaction and communication in the learning process [40]. The panel of experts in Delphi study agreed that the learning contents of EasySeni should be in line with the set learning outcomes of EasySeni. Based on their views, the continuity between the learning contents and the learning outcomes of EasySeni ensures that the implementation of EasySeni achieves its targets. According to the goal of EasySeni to bring up autonomous learners and keep lifelong learning, the learning contents also involve the elements in the aspect of learning attitude covering self-domain and social domain. By adopting and adapting the elements in self-domain and social domain with the learning contents and activities, it leads a transformation to the learners to be highly competitive, high confident in solving problems, highly concerned with the learning environment, independent, accountable, tolerant, respect each other and love knowledge.

6.3 Delivery Strategy

The appropriateness of the selection of the delivery strategy for EasySeni is essential to ensure the goals of EasySeni are achieved. Sharing the same view, Bragg, Walsh, and Heyeres [35] found that an essential key in determining the success of EasySeni is the delivery strategies based on needs and in parallel with outlined learning outcomes. Therefore, the findings of this study showed three themes with high consensus agreement among the panel of experts of the Delphi study including the themes of

- i. training
- ii. learning community
- iii. individual learning.

A modern educator in a new paradigm of educational environment who is flexible and skilfully to adapt different approaches when the situation demands it. These accountabilities are the focus of experts it is important for educators to demonstrate sufficient knowledge to deliver the learning content in a form of individualization, personalization, and differentiation learning, as well as optimize the learning and teaching process to engage a diversity of learners actively and effectively. In the context of this study, EasySeni is a hybrid learning consists of both online learning environment and physical learning environment, educators' role as a facilitator and guide to the learners to engage their active learning and effectively communicate and interact with each other in collaborative activities. Hence, the experts indicated that a learning platform needs to be established to involve functional applications to engage students in training, learning community and self-learning actively.

In the process of learning and teaching for VAE subject, skills are important to be mastered for the purpose of creating artworks or a product. On this account, demonstration and simulation are the key to success in guiding the learners to acquire the skills of visual arts. The hybrid learning environment provides the learners opportunity to be guided individually with a virtual role model in the EasySeni learning platform with delivery method of demonstration in the form of step-by-step instruction and guidance from simpler and easier to more difficult and complicated to ensure the learners fully grasp the skills of visual arts. Further, the experts from the Delphi study indicated that the importance of simulation to provide opportunity for the learners to engage actively in the hands-on activities as the process of knowledge transfer for them to apply the acquired knowledge and skills to produce an artwork or a product.

Following the learning in the 21st century, the learners are taking greater accountabilities for what they learn, how they learn, and when they learn, as well as mastering the learning content while producing, synthesizing, and evaluating information from a wide variety of subjects and sources with an understanding of and respect for diversity of cultures. Learners demonstrate 4C's of 21st century skills (critical thinking, creativity, collaboration, and communication) as well as digital literacy in the learning process. Therefore, the proposed delivery strategies in the EasySeni process are focused on the learning community involving the group learning and personal practice sharing. Learners are involved in solving a task or an assignment in group learning based on individual ideas through collective decisions from group discussion. The learners are also provided opportunity and space to share their ideas and opinions, exhibit their product, involve in the art criticism, and understand how to reflect on their own learning.

6.4 Form of Assessment in Learning

Assessment in learning is a process of collecting data to know better the strengths and weaknesses of learner's learning. The findings of this study proved that the panel of experts in this Delphi study with high consensus agreement to approve the assessment for learning as a key component in the implementation of EasySeni for VAE subject. The experts believed that the assessment for learning is a practical approach to maintain the continuity between the needs, goals, learning outcomes and delivery strategies of EasySeni. In fact, the possibility of errors at each stage of implementation of learning and teaching process can be identified and improved through the assessment and evaluation. Further, through the consensus among the panel of experts in this Delphi study, there are three forms of assessment in the learning and teaching process of EasySeni namely pre-assessment, assessment during the learning process, and post-assessment. According to Baethge, Goldbeck-Wood and Mertens [36], the three forms of assessment are able to measure specific knowledge, skills and the change in behaviour acquired through learning. For the theme of pre-assessment, findings found the form of pre-assessment covering the needs analysis achieved high consensus agreement among the panel of experts in this study. The experts believed that needs analysis is able to provide an accurate picture of the focus in the implementation of EasySeni. For the purpose to understand the learners' prior level of knowledge and skills acquisition, the pre-assessment is important to determine what should do and how to do for the follow up action to plan more effective learning process to ensure the learners master the skills and knowledge in visual arts through diagnostic assessment in the form of games and quizzes. From getting know their progress time-to-time, the panel of experts with high consensus agreement to the establishment of personal profile involving learner's progress bar for them to get updates on their level of skills and knowledge acquisition, strengths, and weaknesses, as well as getting constructive feedbacks through the notification in their personal profile.

Assessment is important to provide valuable information about learner's learning. It also plays an important role in the process of engaging learners' motivation. Well-designed assessment provides essential information which could tell the educators what learners learned, how well they learned and which part they struggled. On this account, assessment is not only involving test or evaluation in the form of written, but it could also be in the form of more interesting, interactive, and flexible. In the context of this study, a variety of type of assessment during the learning process can be implemented such as online interactive quizzes, online interactive games related to the learned topics, presentation, session of question and answer, and brainstorming activity. The educators in this stage of learning can provide guidance and constructive feedback on learners' performance during learning process to help the learners understand their strengths and weaknesses, as well as improve their knowledge and skills by doing reflection and following the suggested follow-up action. Assessment provides a comprehensive picture for understanding learners' learning, identifying invisible barriers, and helping the educators to improve their instructional approaches. For the post-assessment after the learners learn a certain topic, it is tilted towards the assessment based on learners' artworks or products they created. Generally, the focus of the assessment in the context of this study is aiming to close the gap between the learners' current situation and what they want to be in their learning and achievement.

7. Conclusions

The purpose of this study was to determine a consensus agreement on the elements of learning and teaching process-based collaborative and constructivism approach in supporting hybrid learning process for VAE subject at school. The purpose and objective of determining the elements of hybrid learning and teaching based on collaborative and constructivism approach is that to provide a clear prospect and insight to improve the level of knowledge, skills, and competencies among the students, as well as raise the preparedness among the educators in a new paradigm of instructional to support the hybrid learning and teaching process in VAE subject. As the following are the summaries of this study:

- i. In the dimension of learning outcomes, the panel of experts believed that it is outlined based on three aspects including the aspect of knowledge, skills and learning attitude. Learning outcomes are measurable achievements help learners to understand the information and what they will gain from their engagement in the learning activity. On this account, educators have to make the learning outcomes of a certain topic clearer and comprehensive before the implementation of the learning and teaching process. Further, the learners should take accountability for their own learning. Clear and comprehensive learning outcomes are outlined to help the learners to set their learning goals based on what they need to know and what they need to learn from the learning outcomes.
- ii. The learning contents have evolved over years for the purpose to meet the demands in contemporary learning situation. In the 21st century, the learning contents are tilted towards learning resources and materials in digital format. In the context of this study, EasySeni provides a learning platform for a collective learning resources and materials covers the concept and basic knowledge of visual arts, and the fundamental concept of artwork production through the broad skills of visual arts. Further, the learners as the owner of the learning contents, they are authorized to access the learning content without limitation in terms of time and space. Following the demands in the 21st century, the role of the learners is changing as the learning is more learner oriented, they have to

- approach the knowledge and skills with their ability. In this context, a learning community is established in EasySeni to provide an opportunity to the learners to collaborate with peers and use the resources and materials in the platform to solve and complete the tasks given, and finally acquiring the related knowledge and skills.
- iii. It is acknowledged that the delivery strategies are important key to idealizing the learning situation. The decision educators make in how to deliver the learning content should be based on analysis of the learning situation and environment, including the learning outcomes, assessment practices and criteria, and the nature and backgrounds of the learners. In this context, delivery strategies are focusing constructive training and practices, learning community, and personalized individual learning. Since EasySeni is a form of hybrid learning involving face-to-face physical learning and virtual online learning, the educators play an important role as facilitator and guidance to ensure the learners engage actively in the learning process and achieve the learning outcomes.
 - iv. Assessment is an approach to learning and teaching to create feedback which is used for the follow-up actions to improve students' performance. There is a variety of assessment types utilized to collect data to know and understand the strengths and weaknesses of learners' learning with the follow-up action to improve their learning until they master relevant knowledge and skills. The diversity of assessment can be carried out at any stage of learning to engage learners' actively in the learning process and increase their motivation besides measuring specific knowledge, skills and the change in behaviour acquired through learning among the learners. To achieve the goals of assessment, in the context of this study, EasySeni provides a learning platform with the establishment of personal profile for the learners for the educators to give feedbacks and the learners to get updates on their learning progress and constructive feedback to improve their skills and knowledge.

In attendance of the findings of this study, the authors believe that the new defining in learning and teaching process based on the collaborative and constructivism approach and the expansion in breadth and depth of these elements ensure that the best practices of hybrid learning in VAE subject to build the potential of individuals who are knowledgeable and competent, equipping learners with the knowledge, skills and values to overcome life's inevitable challenges as set out by the Malaysian standard curriculum guidelines (MoE, 2019). With an expansion to the Malaysian learning and teaching practice with a new defining hybrid learning and teaching practice guideline, this ensure that all educators received necessary support and knowledge to implement hybrid learning environment by establishing a learning community and learning platform for individualized, personalized, and differentiated learning. Through the re-conceptualization of learning and teaching approach to transitions and new understanding of hybrid learning for VAE subject as involving learning outcomes, learning contents, delivery strategies, and the form of assessment are hoped to be realized and achieved through adequate support from the educators and schools.

8. Guideline for Future Research

In conclusion, this research aims to inform policymakers about possible settings of interactive technology learning environment for the future collaborative and constructivism-based classroom in VAE in line with 21st century skills. The key driver of EasySeni model includes five significant environments involving collaborative, constructive, communicative, supportive, and evaluative learning environment. Each learning environment is established on the basis of four dimensions in

the framework of EasySeni hybrid learning based on collaborative and constructivism approach which are learning outcome, learning content, delivery strategy and form of assessment in learning. The four key dimensions of the framework, learning outcome, learning content, delivery strategy and assessment form, are taken into the EasySeni framework in guiding teachers implementing a collaborative and constructivism-based teaching and learning in VAE. Teachers who do not have to use or lack experience and knowledge in pedagogical and technological skills may encounter difficulties guiding the learners in new learning environments. Knowing how to apply suitable pedagogies and how to use technologies is essential to teachers in EasySeni. To encourage and improve quality in learning and teaching of VAE to fit in 21st century, a stakeholder must also improve professional learning community and broad connectivity to realize the collaboration in sharing knowledge and skills to enhance stakeholders' collaboration and communication skills and directly promote their skill of creativity and entrepreneurial. Collaborative and constructive learning played significant roles in changing learning space practices in formal and informal learning in VAE in the future.

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