

VALIDATION OF THE QUANTUM WORKING-BASED HYBRID LEARNING MODEL IN THE PRACTICE COURSE OF GRAPHIC ART AT UNIVERSITY

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ABSTRACT

This study is purposed to develop a valid Quantum Working (HQW)-Based Hybrid Learning Model in Artwork Practice Course at University. The results showed that the validity of the HBQ learning model developed as model books, lecturer manuals, and student manuals was very high valid criteria. The average validity of the model design is 0.900, language validity is 889, content validity is 0.892, and graphic validity is 0.905. Based on these results, the practice of creating graphic arts by applying a hybrid model based on quantum working meets valid criteria and can not only be used as an alternative to learning, but has become a necessity to increase the self-efficacy of prospective fine arts teachers in the new normal era.

Keywords: hybrid learning, quantum working, graphic art, university

INTRODUCTION

Universitas Negeri Padang (UNP) is one of the state universities in West Sumatra, Indonesia that carries out art learning for prospective teachers. The debriefing for prospective teachers has been prepared in such a way as to overcome various challenges of technological change and development, including anticipating the impact of the spread of the Covid-19 Virus. Hence the beginning of 2010 the application of the blended learning model has begun to be promoted, the optimization take place after 2019. After running the process for some time through new normal era, it is seen that blended learning learning will be needed all the time and directed at learning hybrid models.

One of the departments that is quite enthusiastic about the learning program run by UNP is the Department of Fine Arts. This department focuses on creating prospective art teachers, artists and critics and even entrepreneurs who have good knowledge and skills in art, especially fine arts. One of the important materials in the study of the field of fine arts is Graphic Art material. Graphic art is a compulsory subject that must be followed by all students in the department of fine arts.

The development of graphic arts at state universities in West Sumatra, especially at UNP is seen as not as fast as the development of other universities on the islands of Java and Bali. This fact cannot be denied because historically it was higher education in Java and Bali that initiated the emergence of art colleges, especially after the Persagi era and the Japanese Occupation. Therefore, when various art public lecture platforms are run during a pandemic, whether

through Zoom and Google Meet, there is a great opportunity to be able to align learning programs with other art universities that are far more advanced outside Sumatra. Thus, the implementation of learning in a hybrid way is considered appropriate to improve the quality of learning from various points of view.

Graphic art courses are classified into practicum courses, totaling 3 credits per semester. The graphic arts course also requires students to not only work at university but also outside the university. And so far, the lecturers' monitoring has focused on activities at the university. There has been no form of assignment reported by students for outside university activities related to efforts to complete assignments given by lecturers regularly.

The linkage of this hybrid learning model with the quantum working method is in accordance with the working method introduced.

Identifying and embracing the web of relationships internal and external to the system is imperative. Everyone receives their identity from each other, and in turn, create the identity of everyone else. Measuring by taking apart the whole to observe individual parts, takes us further away from reality. The whole can only be understood by looking at the whole as a system; it needs to be observed over the breadth of time and space (Rettig, 2016).

It can be summarized that Quantum Working (QW) is a way to simplify long and difficult activities to become shorter and easier to realize. QW also makes energy and costs less and saves money. Indicators that can be further elaborated on QW start with the following activities (1) seeing, hearing, and feeling; (2) contemplating, and perceiving, all events and phenomena that exist around students to be used as a source of creative ideas; (3) gathering various mastered information to be used as new creations; (4) estimate the cost, the strength of the working capital while still based on the interest and orientation of the creation of two-dimensional works; (5) realizing new thoughts and concepts into two-dimensional objects through the activities of managing tools, materials, and work processes; (6) complete the work properly until the completion of the work; (7) reflect on the achievements achieved with gratitude. Thus, when the HQW model is implemented, online learning becomes an effort to work faster, more accurately, and efficiently.

In quantum learning theory, students are able to find information in their own way regarding what they remember and then store it in long-term memory. And that way students can access any information they need at any time (Afacan, 2019). De Porter said that the quantum learning model is very suitable to be applied to learning that requires multisensory development, with multi-intelligence in one's brain. And quantum learning will also increase the ability of lecturers to inspire students to develop rapidly. Quantum learning is easy to apply, natural, flowing, and with a contextual approach like hands-on practice. Meanwhile, in Indonesia, the quantum learning model is known by the abbreviation TANDUR (Sujatmika, 2018). T for Embed, A for Natural, N for Name, D for Demonstrating, U for Repeat, and R for Celebrate (Setiawati, 2015).

Quantum teaching is analogous to the concept of quantum physics proposed by Einstein with the formula:

$$E = m \cdot c^2$$

E is Energy (Enthusiasm, effectiveness, learning, and enthusiasm) m is Mass (all individuals involved, situation and material)

c is Connectivity (the relationship created)

In the quantum teaching model, a quantum teaching strategy is also implemented, and this strategy makes students more active in the learning environment. This is possible because of the positive mixing of emotional components to interact with other students and lecturers so that learning becomes more meaningful and the subject will last a long time in memory (DePorter, 2010). Furthermore, the quantum teaching model is also accompanied by a method with the same name, namely the quantum teaching method. The quantum learning method in Indonesia aims to produce an effective learning environment through curriculum design, content, and facilities that support the smooth learning process (Oktavia, 2018). The application of the quantum teaching model in learning has been proven to increase the confidence of prospective teachers, communication skills, and sensitivity to the environment (Afacan, 2019).

When these two models are combined for practical lectures, this model is further elaborated into quantum working. With the same mechanism as the application of the hybrid model and the quantum teaching-learning model in the subjects studied, it was also developed in the graphic arts course. If the other courses are dominated by theoretical learning activities, then in the graphic arts course there is more time for practicum. Students move more, move places, and expose their psychomotor abilities.

The involvement of web-based technology in learning is a characteristic of the hybrid learning model. Using technology is evident in preparing lesson plans (1) e learning, (2) video technology (Kamruzzaman, 2014). The use of technology in learning is also defined as an effort to find "added value" from practice recovery because it is challenging, fun, exciting, and meaningful, Prensky, 2001; Lagan, 1997 in (Foulger, 2011).

The understanding of Quantum Working in the application of this Hybrid learning model is not the same as Hybrid Art. As it is known in the art world.

The "Hybrid Art" category is dedicated specifically to today's hybrid and trans-disciplinary projects and approaches to media art. Primary emphasis is on the process of fusing different media and genres into new forms of artistic expression as well as the act of transcending the boundaries between art and research, art and social/political activism, art and pop culture. Jurors will be looking very closely at how dynamically the submitted work defies classification in a single one of the Prix categories of long standing (Electronica, 2020).

Besides, Kelomees (2012) introduced a new artistic category called “Hybrid Media” in contemporary art and new art media. These media represent a collaborative approach, by combining various competencies and showing developments along with the advancement of telecommunications and information compared to the use of creative media in the past. This thinking is based on research or a scientific approach to creating art that is combined with traditional approaches so that it can be seen as an invention, or a new one born because of the new media era. This research-based artwork is generally related to the completion of doctoral programs at universities that have art majors. Researchers, as artists, are required to produce quality works and produce cross-disciplinary projects as an illustration of their creations that have novel value, using new methods, so that unique works are produced (Kelomees, 2012). Therefore, the development of the HQW model this time is limited, that the notion of hybrid is usually focused on learning models, not the results of his work. In other words, the only approach is in the process of working using hybrid methods, because what prospective art teachers produce are works of graphic art that will be used as a reference by junior high, high school, or vocational school students in creating graphic arts (in the traditional sense). The Quantum Working itself is also focused on selecting relevant media, trying to make it easy to get around, easy to process, and inexpensive.

In principle, the hybrid model becomes part of online learning that combines face-to-face and distance activities. There have been many hybrid learning models developed in universities, but few are oriented toward the implementation of practicum courses. When it is connected with the learning of graphic arts practical courses, the practical learning must include all practicum activities carried out outside the campus as a framework of activities that cannot be separated from the goal of mastering the knowledge and skills of graphic arts by prospective art teacher students.

The success of efforts to achieve the learning objectives of graphic arts in order to master the theory of work as well as the practice of work is measured by the appearance and the final product. When the appearance or performance of students on campus has not described their overall work potential, then an internet connection adapted to a hybrid lecture scheme can be used as a solution to determine the progress of work outside of campus. This activity is very possible because the 3 credits of practical courses pack 3x170 minutes of face-to-face meetings per week per semester with additional activities of 3x170 minutes of structured activity and 3x170 minutes of independent activity per week per semester.

The progress of work that is declared to meet the criteria for QW-based hybrid learning is one that has performance report indicators with content that includes the availability of tools and materials as well as practical, effective, and efficient work processes. Some applications that are declared suitable for long-distance communication as well as being easy-to-use social media are WhatsApp, Facebook, Instagram, Telegram, and Blogs. Thus, practical learning, which so far has only measured its success rate by direct observation, has shifted towards indirect assessment through Android mobile phones. Economic and political issues are often raised as sources of creative ideas in graphic arts (Kierulf, 2015). The problem is, can the printing technology that is ancient represents something that exists in the present?

METHODS

Students evaluate themselves and communicate the work that has been created. This research is research that belongs to the Research and Development category, which aims to develop a Quantum Working-based Hybrid Learning Model in the Graphic Art Work Practice Course that is valid, effective, and practical. The development procedure chosen is the Borg and Gall model. The Borg and Gall development procedure consists of 10 stages comprising: (1) research and information collecting; (2) planning; (3) develop a preliminary form of product; (4) preliminary field testing; (5) primary product revision; (6) main field testing; (7) operational product revision, (8) operational field testing, (9) final product revision; and (10) dissemination and implementation (Gall and Borg, 2003).

In the first stage, literature and pre-survey studies have been completed regarding the design of a quantum working-based hybrid learning model, integration of hybrid learning with practicum courses, studies related to student learning tendencies, relevant research, needs analysis of quantum working-based hybrid learning for prospective fine arts teachers in the field of visual arts. practical lectures (Sandra, Effendi, and Atmazaki, 2020).

In the second stage, a needs analysis has also been completed as well as determining the objectives and indicators for developing a hybrid learning product based on quantum working which refers to the criteria for product effectiveness and a small-scale feasibility test. A feasibility test was carried out to see the completeness of facilities and infrastructure at the Department of Fine Arts, Padang State University related to model development and application of research results.

Entering the third stage, conceptual models, hypothetical models, learning material design, and evaluation instruments are made. This conceptual model also includes the basic philosophy, theoretical framework, methodological components, and technical components. The hypothetical model is used as a temporary model of HQW which is based on a conceptual model so that it can also be used as the basis for developing HQW syntax. This third stage is very important to find out how important it is to apply the HQW model to the graphic arts practice course. At this stage, products are produced in the form of model books, lecturer manuals, and student manuals. At this stage, instruments were also developed to test product validation. The instruments tested included instrument validation, model book validation, lecturer guidebook validation, and student guidebook validation. Calculation of the final value of the validated data using a scale (0-100) using the Aiken's V formula (Eddison, et al, 2022), namely:

$$V = \frac{\sum S}{[n(c - 1)]}$$

Meanwhile, the level of product validity is based on the following criteria:

Table 1: The Valid Criteria

Correlation		Information
0.801	1.00	Very high validity
0.601	0.800	High validity
0.401	0.600	Medium validity
0.001	0.400	Low validity
≤0.00		Invalid

Source: (Arikunto, 2015)

RESULTS AND DISCUSSION

As completion of the third stage in formulating a hypothetical model, it can be described as follows:

1. The design of a quantum working-based hybrid learning model in the graphic artspractice course

Syntax

The idea of developing a Quantum Working-based Hybrid Model originated from incorporating technology as a strategy to support the learning process across fields of study that combine science, technology, engineering, and mathematics (STEM-Science, Technology, Engineering, and Mathematics) which has been shown to have a positive effect. It is known that the main factor in the success of implementing STEM is the learning environment, which indeed moderates the success of the STEM integration itself (Yang, 2020). Moreover, it is explained that educators are to position the benefits of using technology in packaging the learning environment as follows.

Table 2: The rationale for the adoption of technology utilization strategies in managing an integrated learning environment

Category	In what form is the technology used?	References:
Authentic learning context	Provide context-based authentic learning settings using three-dimensional printing or modeling.	Kwon, 2017; Wu, 2010
Web-based inquiry environment	Channeling online approaches and networked co-working spaces	Ciu & Linn, 2011; Chiu et al., 2013; Chou & Moaveni, 2009; Perrin 2004.
Emerging and developing interactive technology	Provide simulation and expansion of physical learning activities through computer technology.	Yang et al. 2012; Dede, Grotzer, Metcalf & Kamarainen, 2015; Hsu et al., 2017; Lamb & Annetta, 2013; Nat et al., 2013;; Restivo et al., 2014
Creating content	It will be easy for students to learn advanced specialized skills to construct knowledge and create products.	Ardito, Mosley, & Scrollins, 2014; Barker Nugent, & Grandgenett, 2008; Beal & Cohen 2012; Cira et all., 2015; Grubbs, 2013; Habash & Suurtamm, 2010; Karp & Maloney, 2013; Kopcha et al., 2017; Leonard et al., 2016; Yuene al., 2014

Source: (Yang, 2020)

If it is possible to be carried out simultaneously and continuously across disciplines in one learning package, then it is seen as having the same benefits as art learning. With technology, the ease of the learning process, as stated by Barbour et al, Hosman & Cventanoska in (Kaur, 2020) when students have access to technology and teachers are well-trained in using technology to support pedagogy, both, learning and teaching thrive. The more familiar, well-trained, supported, and confident teachers are with technology, the more likely they are to use it in the classroom. In other words, when students have access to technology and teachers or lecturers are trained in using technology to support the learning process, then these two aspects of learning will be able to develop well. Educators who are familiar with technology and trained will have high confidence in using technology in learning. Reflections on the use of this strategy in packaging the practice of graphic arts learning to use a hybrid model based on quantum working are:

Table 3: Material hybrid syntax based on quantum working

Category	In what form is the technology used?	Representation in graphic arts practice learning
Authentic learning context	Provide context-based authentic learning settings using three-dimensional printing or modeling.	Raise personal ideas (experiences that are still traced) or personal responses to social situations that are currently warm as inspiration to work according to the resources they have (tools materials, processes controlled).
Web-based inquiry environment	Channeling online approaches and networked co-working spaces	Meet the requirements for strengthening the source of the idea of creating works of reference sources from the internet by making adjustments or updates from examples of existing (tested) works. Ex: Wiki, Google search engine, etc. At the same time, looking for opportunities to use tools that are easily obtained, inexpensive materials, and processes that are easy to implement ideas.
Emerging and developing interactive technology	Provide simulation and expansion of physical learning activities through computer technology.	Utilizing social media for consultation or mutual control through open corrections (WAC and FB) in individual and group forms
Creating content	It will be easy for students to learn advanced specialized skills to construct knowledge and create products.	Complete creating art by including a process report with a self-actualization format (at least through a blog or FB).

Source: adapted by (Yang, 2020)

Additionally, related to flipped rotation type hybrid learning, the reference syntax is obtained as stated by Lee (2017) and Effendi (2020).

Table 4: Relevance Study

Syntax	Flipped Classroom	WBFCMI
	<p>Stage 1. Learning activities outside the classroom. Students learn individually through the presentation of videos containing activity material, material slides, questions, and answers, or online discussions.</p> <p>Stage 2. Learning activities in class (face to face). Students can work individually or in groups with teacher guidance to complete assignments and ensure that new knowledge or skills have been mastered.</p>	<p>Stage 1. Orientation activities, face to face; 2. Implementation of online learning (before face-to-face classes); 3. Face-to-face class discussions; 4. Implementation of online learning starting from making summaries and conclusions, writing essays as reflection related to the material that has been studied and mastered; 5. Implementation of the assessment in the form of a quiz as part of the formative test.</p>
Source	(Lee, 2017)	(Effendi, 2020)

By referring to the description of the use of technology in learning above, the syntax for learning the Hybrid model based on quantum working is formulated as follows:

Table 5: Syntax of Quantum Working (HQW)-Based Hybrid Model

Learning Activities	Indicators of Learning Outcomes	References
Stage 1: Apperception	Connecting old knowledge with new knowledge to be explored	Prior knowledge (Hicks, 2016); Brainstorm, Schemata, convergent thinking, divergent thinking.
Stage 2: Connection	Transfer of learning from various sources and various means of communication	Teori pembelajaran hybrid, internet, interpersonal (Kamruzzaman, 2014).
Stage 3: Creation	The creation of works of art is followed by a repetition of the work process and exhibitions	Creative process (Britanica); Creativity (Dietrich, 2004).
Stage 4: Reflection	Meaning and application of knowledge and skills to self and other fields with gratitude.	Teori resilience, (Norman Garmezy) Teori pragmatis (Buehl, 2009).

Principle of Reaction

The principle of reaction in education implementation of learning in higher education can be expressed as the reaction of lecturers to student activities. The following are the activities of

lecturers who demonstrate the principle of reaction in the application of the HQW model, especially in practical courses, which can be described as follows:

Table 6: Principles of Reaction in the Hybrid Learning Model

LearningPhase	Lecturer Activities	Students Activities
Stage 1: Apperception	Providing face-to-face lectures gathering information and connecting students' existing knowledge with new knowledge to be learned	Summarizing new information from lecturers and connecting knowledge that has been mastered and preparing for creating new works.
Stage 2: Connection	Provide a channel to communicate directly with students to help make it easier to complete practical assignments.	Seek additional information as much as possible from various sources
Stage 3: Creation	Encouraging the creation of innovative tools, materials and processes from the findings obtained by students	Realizing new ideas and creations that add value to knowledge attitudes, and skills.
Stage 4: Reflection	Encouraging and giving a positive influence on the materials and creations that have been successfully realized by students	Retell what has been learned in their own language. Make activity reports during lectures

The creative stage is an important part of the thinking process. The thinking process itself includes 3 assumptions, namely (1) thinking can be taught; (2) thinking is an active transaction process between individuals and data; (3) the thinking process itself involves a series of activities that have a series of Activities carried out when reflecting on lessons that have been completed include retelling what experiences have been obtained, ranging from interesting to perhaps confusing or difficult to learn. Then class members respond or change roles by telling their experiences as well so that there can be questions and answers that are useful for clarifying what has been learned and even developing empathy in other situations that are felt by colleagues.

Social System

The roles of lecturers and students are connected to a model social system. The relationship describes the hierarchy or authority of lecturers and students. And in this social system, there are also various rules used by lecturers to motivate students to work better. There is active and interactive communication between lecturers and students, both face-to-face and through social media. The role of lecturers as facilitators and motivators helps increase the role of students with a student-centered approach. Students are more active when studying. Lecturers monitor and direct students to further improve their performance with a variety of information on learning resources from the internet when implementing Quantum Working-based hybrid learning.

Support System

The support system in the HQW model includes all supporting facilities, tools, and materials that can facilitate the creation of graphic arts. More specifically, it can be stated that the supporting factors for the development of the HQW learning model are module books and assessment instruments. The module book contains information on graphic arts learning by utilizing the internet and practical materials and equipment that are easy and inexpensive to create. The assessment instrument comprises two parts, namely performance assessment, and product assessment. When a work of graphic art is created, the prospective art teacher must be able to account for it for the benefit of the development of science.

Instructional impact

The instructional impact includes a deeper understanding of concepts in students related to the material being studied. Specifically, this instructional impact is known by comparing HQW learning with those who do not apply HQW in the same course, namely the Graphic Arts course. To create good graphic arts, student-teacher candidates master (1) make alternative sketches, (2) choose operational sketches to be followed up, (3) transfer sketches to matrix, (4) carry out the processing of matrix properly, (5) print, (6) include identification of works, and (7) finishing.

Accompaniment Impact

The accompaniment impact includes the positive influence that accompanies the instructional impact. The main positive influence on students is increasing self-efficacy as well as increasing work performance. This impact is not only for the sake of short-term learning but also for the long term when students have direct contact with the socialization activities of creating graphic arts, and optimism in dealing with everyday problems, especially those related to the use of technology, as well as tools or materials for creating art. existing graphics. The ability to make decisions that are fast, precise, and useful for many people. Learning scheme with the HQW model in the graphic arts practice course

Table 7: Learning Scheme of HQW

Learning Stage	HQW phase	Learning Activities	
		The method applied by the lecturer	Activities for students
Introduction Outside university	Apperception	Lecturers provide information that connects students' old knowledge with what will be studied. Lecturers ask questions that can improve students' critical thinking patterns, through questions that refer to memory, scattered thinking patterns, centered thinking patterns and questions that are evaluated in brainstorming.	Students describe the knowledge and skills that have been mastered and are ready to receive new material. Students look for additional information using keywords provided by the lecturer through the reading materials provided.
Core outside and inside university	Connection	Asynchronous The lecturer directs the agreed form of assignment and monitors student learning progress through social media applications	Students in small groups can discuss roles or study assignments that must be completed according to the schedule.
	Creation	Face to face, synchronous Lecturers provide opportunities for students to channel their expressions by creating two-dimensional works of art, in this case carrying out creating graphic art.	Students carry out the work on the agreed-upon tasks and report the progress of the completion of the tasks through the agreed social media.
Closing outside and inside university	Reflection	Face to face, asynchronous. Lecturers help direct students to summarize the knowledge and skills mastered Students evaluate themselves and communicate the work that has been created.	Students evaluate themselves and communicate the work that has been created.

2. Validity of Hybrid Learning Products Based on Quantum Working

The design of learning model and graphics was validated by 4 people who were experts in their field particularly in language and arts faculty, meanwhile the language and content was validated by 3 people. The validation done through model books, lecturer manuals, and student

manuals. The validation can summarize follows.

Table 8: Product Development Validation Results

Criteria	Component	Validity	
		Score	Description
Model Design	Rationale, supporting theory, syntax, social system, reaction principle, support system instructional impact and accompaniment impact, implementation of learning	0,900	Very high validity
Language	Writing in a book, systematic book writing consistency, language suitability punctuation, letters, sentence structure	0,889	Very high validity
Content	Model books, lecturer manuals, student manuals	0,892	Very high validity
Graphics	Book format, product readability completeness of book content, letters, color composition, image presentation, table presentation, cover design	0,905	Very high validity

CONCLUSIONS

Based on the results of the study, it can be concluded that the development of the HQW model has very high validity. The measurement of the validity of model designs, language, content, and graphics on product model books, lecturer manuals, and student manuals are all at a very high level of validity. This shows that the HQW model meets the criteria of relevance and consistency. Thus, this model can be continued in the preliminary field research stage. This stage also aims to prove that the HQW model is no longer just an alternative in artwork practicum learning, but has become a necessity in the new normal era.

AUTHORS' CONTRIBUTIONS

YS wrote the manuscript and provide data in Table, ZME monitored the observation done by YS, and A check all statistical analyses. All authors reviewed the final manuscript.

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CONFLICT OF INTEREST STATEMENT

The research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

DATA AVAILABILITY

The data describe in this article are available in <https://rb.gy/nxtxuc> ; Model Books can be found in <https://osf.io/vkta8> ; Lecturer Manuals can be found in <https://osf.io/s75cq> ; Student Manuals can be found in <https://osf.io/mv8xb> ; Authors Profile can be found in <https://rb.gy/gwyxoe>

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