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Application of Project-based Learning for Primary Teachers - A New Direction in Professional Training at Pedagogical Universities and Colleges in Vietnam

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Abstract--- *Teaching staffs in general and primary teachers in particular have been proven to contribute to great success of the comprehensive renovation process in the current Vietnamese education system. Significantly, pedagogical universities specialized in primary education should predominantly pay attention to the quality of training and meet the requirements of society. In the case of Tay Nguyen University in Vietnam, lecturer staffs involved in training of primary teachers have made great efforts in applying new teaching methods. Furthermore, it has been used effectively in many parts of the primary teacher training program is the project-based learning method. In this paper, in addition to general theories about the project-learning method, we will present the advantages of applying the teaching method in the primary teacher training program in general and in the "Crafts and Techniques" module in particular at Tay Nguyen University. Finally, discussion process of applying project-based learning and project evaluation methods of primary education students in teaching this module are preferred*.

Keywords--- *Crafts and Techniques, Primary Teachers, Project-based Learning, Tay Nguyen University.*

I. INTRODUCTION

Education in general and primary education in particular has been considered as a very important factor in promoting economic development and sustainable development in each country. This duty has greatly played an important role in education of young generation, creation of new resources in the 4th industrial revolution nowadays, and building Vietnam to be a developed country in the next 20 years (Tran et al., 2020). Theoretical discussion pointed out that a healthy country can support more resources for education and promote more high-skilled labor force for economic development. Further, human capital has been known as a key indicator to enhance growth quality and drive of change in lifestyle and living conditions (Nguyen et al., 2020a).

The current situation and practice in education show that higher education will predominantly change how to educate human resources with both knowledge and skills to meet the requirements of economic and social development (Mukherjee et al., 2016; Mukherjee et al., 2017;Hussain and Hassan, 2020; Hussain et al., 2020). In

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addition to the planning, communication and collaboration skills, it is very important to teach learners about the responsibilities of a global citizen. The need to change to adapt to the world in the new century is the main reason for active teaching methods including project-based learning methods to be popularized in Vietnam and around the world.

Tay Nguyen University is a multidisciplinary university located in a difficult area in Vietnam with the low level of economic development while the human resources' quality is not high. In recent years, many schools have launched a movement to renovate teaching methods, encouraging teachers to use positive teaching methods to enable students to explore knowledge, enhance communication, reception, cooperation skills and creativity (Nguyen et al., 2020b). In the field of primary teacher training, the lecturer staff also endeavor to find solutions to improve the quality of training to meet the requirements of primary teachers in the Central Highlands region and provinces in the vicinity. It is important to mention that project-based learning method has brought in many countries in the field of professional training and development for education. In particular, we have chosen to apply project-based learning method in teaching and training students for the "crafts and techniques" module, as a way to improve the quality of primary school teachers in this locality. The process of implementing the project-based learning method has provided interesting experiences while also drawn useful lessons in teaching and research. In this article, we will reintroduce some of the content learned in teaching "crafts and techniques" modules by applying project-learning methods.

In the context of institutional transition in Vietnam, the government that can create, enforce, and apply laws, and often support primary education in order to sustain a future build for Vietnam. To the best of our knowledge, a very few studies has focused on analyzing how application of project-based learning for primary teachers in the case of developing and emerging economies, especially in the low-middle income economies. Therefore, the general objective of this study aims at fulfilling this gap by discussing the correlation between this content. The purpose of the study is also to mention the relationship between how application of project-based learning for primary teachers and the specific case study of a difficult area in Vietnam.

II. LITERATURE REVIEW

The method of project-based learning was conceived in architectural schools in Europe (Italy, France) since the 16th century (Knoll, 1997). By 1918, it was introduced by William (1918), an educational philosopher at the University of Education of Columbia University in the article "Project-based learning Method", which attracted a great deal of attention among researchers in the field of education in the world. As suggested inWilliam(1918), the project is a purposeful and whole-hearted implementation. Further discussed on this, the Buck Research Institute, USA concluded that project-based learning is a teaching method in which students gain knowledge and skills by working for an extended period to investigate and respond to a complicated question, problem or challenge. In accordance with the socio-cultural conditions of the modern world based on Sustainable Schools Project (2020), by the project-based learning method, learners are allowed to make a number of choices about the products to be created, the way they work and spend time based on the instruction of teachers depending on their age and project-based learning experience.

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As shown by Wu and Wu (2020) study on students enrolled in the subject of computer science, and engineering project in the College of Engineering at National Taiwan University. They divided students into many groups. In particular, each student will engage in doing a project-based learning. Developing skills abilities for employment based on a combination of interdisciplinary knowledge, and creative enhancement. This method can improve the students' creativity, critical thinking, especially transmit of learning skills. Further discussed on this process, the method of creativity training and teachers' provision of suitable requirement program for enhancing creative thinking are much dependent on critical topics. By enhancing students in experimental activities in the two semesters, Wu and Wu (2020) demonstrated the fluctuations between high- creativity and low-creativity learners regarding cognition, personal motivation and characters.

Further investigated on the relationship between learner-centered education and teacher's self-efficacy, Choi et al. (2020) using a sample data collected from project-based learning and applied the method of quasi-experiment. It is important to note that a greater project-based learning can positively impact on teacher's self-efficacy. Additionally, project-based learning can be positively connected with student's engagement and instruction. In some cases, students can contribute a great role in positive response to the practice that may negotiate the correlation between project-based learning and teacher's self-efficacy.

John (2000) in a study and identified that five basic characteristics of projects could be impacted on project-based learning, for example: Centrality, Driving questions, Constructive investigations, Autonomy and Realism. As shown by Kwon et al. (2014), and Patton (2010) emphasized that the importance of student cooperation in project implementation can be affect the quality of project-based learning. The uniqueness of project-based learning is the development of a final product (Helle et al., 2006), a specific item that represents students' newly acquired insights, knowledge and attitudes about the issue being investigated which is often presented with videos, images, sketches, reports, models and other collected artifacts (Holubova, 2008). Care for the youngest generation and enhancement of educational quality, project-based learning could provide a wide range of benefits for both students and teachers as: increased participation, enhanced self-reliance and improved attitudes towards learning. It is further promote professionalism, collaboration with colleagues, and opportunities to build relationships with students (John, 2000). Therefore, project-based learning is beneficial to increase student participation, increase interest in content, develop strong problem-solving strategies, deepen learning and transfer new skills (Margaret, 2011); enhance students' learning motivation because when learners engage in real and challenging real world, their learning motivation can increase (Suha et al., 2013). A large number of studies have significantly demonstrated that through project learning, students become better researchers, problem solvers and higher level thinkers, learners have good skills, as well as a positive and engaging learning attitude (Pongkitwitoon, 2017). Moreover, project-based learning also nurtures the qualities of workers in the new era because during stages of a project, careful planning is expected to require so that students can complete the work in due time. As a result, learners' responsibility, independence and discipline are considered to be the three main benefits of the project (Bell, 2010). It can be said that projects enhance students in an active role such as problem solvers, decision makers, investigators, document providers, etc. (Intel, 2020). Additionally, project-based learning offers many benefits, the specific challenges teachers face include: Identifying situations that create good projects; Structuring issues such as learning opportunities; Collaborating with colleagues

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to develop interdisciplinary projects; Managing the learning process; and integrating technology when appropriate (Intel, 2020). It is very important to note that evaluation is also seen as a challenge in project-based learning, as described by Buck Institute of Education (2016), the main areas of evaluation in project-based learning are: Critical thinking, cooperation, communication and creativity. In order to evaluate the results objectively. Bethany (2006) based on the Clark proposed the evaluation form, in the evaluation method: evaluation of teachers, self-evaluation of learners, peer-evaluation, and evaluation of other groups. In addition, peer-evaluation enables the evaluation results to be more objective because it is often difficult for the teacher to stay informed of all the activities in a group; whereas students in the group should be able to recognize the contributions of their team members (Bethany, 2006). The evaluation of project-based learning outcomes not only focuses on the product but also the project implementation process. In general, this process is divided into 7 steps of Nizwardi et al. (2017) or 8 steps Perkins (2019).

III. MATERIALS, METHODOLOGY AND RESULTS

3.1. Materials

The data of this study were collected from the primary sources. We interviewed and observed both lecturers and students, participants in the schools. The data need to solve the missing and correction of some errors before doing the analysis. The study has conducted on approximately few classes in Tay Nguyen University in 2019. To do this study, we use more discussion about the existing learning and teaching method in the university and schools.

3.2. Methodology and Results

In the background of applying project-based learning, the content of the manual technology module and teaching methods comes from real life, suitable for organizing project teaching. Furthermore, the second reason is to develop the competency and quality of the learners. Indeed, entering the twenty-first century, the social and professional context in the world is changing rapidly, workers in the new era need to be equipped with appropriate skills to succeed in school and in life living. The proven practice and teaching of the project have created favorable conditions for learners to acquire 21st century skills: creativity and innovation, critical thinking and problem solving, assigning reception and cooperation, using information technology, using safe and effective technology (Pongkitwitoon, 2017). In addition, project-based learning increases student participation in content, develops strong problem-solving strategies, and deepens learning and transfers new skills (Margaret, 2011). Specifically, teaching method of the project is not limited to providing students with content knowledge, but also further developing their psychology and social skills (Moursund, 1998; Kokotsaki et al, 2016). For example, seeking information from different sources, critical thinking, problem solving, self-assessment, summaries and presentations. In other words, through teaching an educated learner project holistically rather than focusing on one aspect of learning, creating a motivation for pushing students to focus more on challenging issues. Besides teaching the project, it also fosters the qualities of workers in the new era, which are the responsibility of the learners, the independence and discipline of the learners (Bell, 2010) while creating smarter citizens, be more creative and able to lead, manage, collaborate and connect more with effective people around the world. Participating in project learning is one of the best ways to cultivate quality and competency. Therefore, project teaching is considered an authentic strategy to enrich the skills of learners in the 21st century.

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Deeply discussed on the process of applying project-based learning methods in teaching “Crafts and techniques” module. In this context, the process of applying project-based learning methods in the "Crafts, techniques’ teaching module is divided into 4 steps as shown in Fig.1.

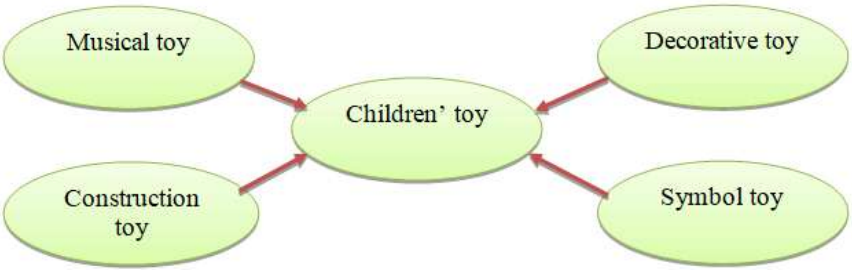

Fig. 1: Building Sub-topics (Project)

Step 1: Select the Project

Fig.1 indicates the characteristics of the project-based learning method and the characteristics of the module, we design a 4-step teaching process as above. Specifically, the project is based on practical conditions of the school and locality; based on the objectives and content of the module; based on the issues in social practice and students' interest to design project topics. Specifically, the lecturers organize the students to develop sub-topics or the title of the project. For example, Fig.3 indicates that the topic "Children's toys" can develop into subtopics: Musical toys, decorative toys, symbol toys, construction toys, etc.

Once the topic and project have been identified, the lecturer instructs students to use the mind map to identify research issues related to sub-topics. The Fig.2 will explain for this analysis:

Fig. 2: Identify Research Issues

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Step 2: Planning the project implementation

As discussed, after designing the scale and content of the research, students discuss to determine the tasks to be performed and assign tasks to members, determine the deadline, cost estimates and support facilities.

Step 3: Project Implementation

This is a very important step in the process of applying project-based learning methods. In fact, each member prepares necessary materials and tools; to apply technical knowledge to design the technical process, and apply this process to create products according to project requirements.

Step 4: Project Completion

To be concluded, this step is to display products, report the process of making products, and evaluate projects.

For the participants, especially students and lecturers to understand what the full process of applying project-based learning methods, it is necessary to systematically observe the play appeared in the Figure 3. In this figure, it indicates that there are four major indicators in relation to project-based learning methods, including: Choose a project, Project planning, Project implementation, and Project completion.

Regarding project selection, it is important to find out that Lecturers and students must be correlated in the same way. First, lecturers, students develop topic networks. After that, students develop into sub-topics (projects) and identify the project goals, content and products. For project planning, the method still requests some activities of students in agreement with task assignment. They must be estimated funding, support tools used in the teaching method.

In terms of project implementation, there are two major activities for students. First, it is important to note that students should prepare materials and tools before the uses of project-based learning methods. This helps more successfully in the study. In fact, photos and video recordings are also more valuable resources providing information about the realization of play/playing children in the study.

Further, students should design products and organize product processing in order to manage the effective teaching. During the project implementation, some errors could be happened, it is important to make the diagnosis based on evidence and promptly solve them. Finally, for project completion, it suggests that students need to report the process of making and presenting products and students, and particularly lecturers should spend much time on evaluating the project results.

Further discussed on how evaluation in project-based learning of “Crafts and techniques” module, it is evident to mention that project evaluation is a competency assessment and evaluation. In this context, the purpose is to assess the ability to apply the knowledge and skills learned in solving real life practical problems. Assessments are carried out at every moment of the teaching process. In order to access, the project evaluation tools conclude lecturer’s project tracking record, student's project profile, evaluation form.

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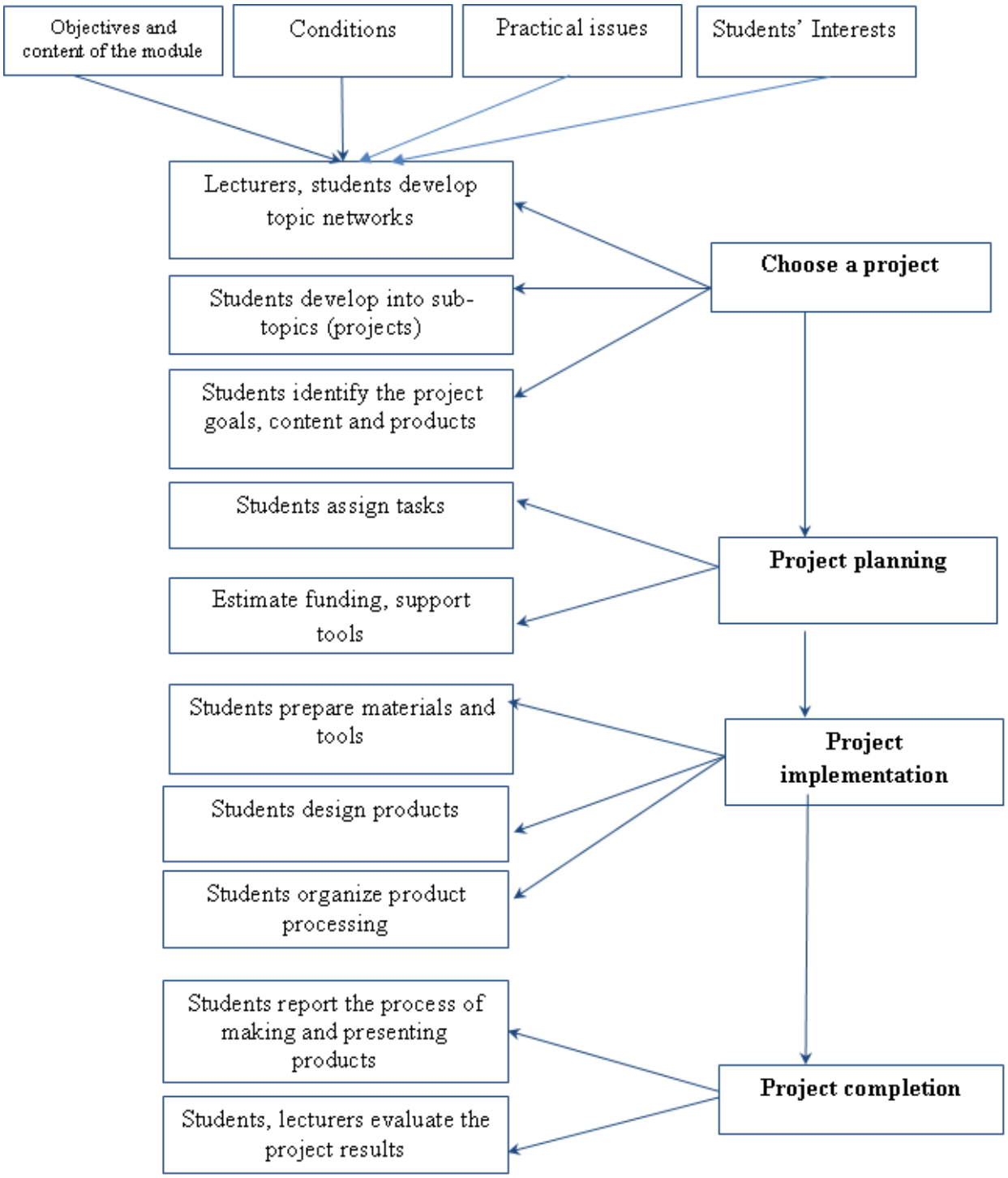

Fig. 3: Teaching Process of Crafts and Techniques Module Project

In the process of applying project tracking record of lecturer, it needs to record what the lecturer observes during student implementation of the project such as quality of work, activeness, self-reliance, creativity and other competencies, to design the evaluation criteria for the level that students achieve. Among lecture track record, it should follow in the following contents and criteria:

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Fig. 4: Lecture Track Record

Fig. 4 depicts the lecture track record discussed in this study. Approximately ten steps should be focused. It can be explained in the following discussion:

- Detecting problems: to be able to detect problems from practical situations or from lecturers' suggestions at different levels.
- Project ideas: to give project ideas or base on suggestions of lecturers at different levels
- Project topic: to choose topic or base on suggestion of the lecturer
- Project objectives: to determine the project objectives or base on the lecturers' suggestions
- Proposing solutions: to propose suitable solutions or with the guidance of lecturers
- Project plan: to develop a detailed project plan which is consistent with the project
- Project implementation: To follow the plan and schedule.
- Report and present the product: in a clear, coherent, fluent, timely manner; to collaborate with team members, answer questions with cooperative attitude
- Project evaluation: to have project evaluation skill
- Summarizing and drawing experience: to draw lessons for the next projects

In the situation of student's project profile, it depicts that this is the basis for evaluating the project implementation process from the beginning of the project idea, group division, work planning to final project completion, to record all the details during the project implementation. According to the project evaluation form, this has few evaluation criteria, for example: material model, product presentation, etc. Furthermore, student evaluation form (evaluated by lecturers and student groups) includes the following contents and criteria:

- Firstly, project's products: products suitable to the project's objectives, in the correct process, to be creative and completed on time.
- Secondly, PowerPoint presentation: to clearly state the research content, implementation process and project products. Orderly presentation format, suitable illustrations, etc. The presentation is creative, cooperative and informative.

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- Thirdly, student project tracking book: complete, updated notes of the project progress.
- In terms of Peer evaluation form (among students in one group), the study will focus on three criteria as follows:
- Firstly, knowledge: to participate in proposing solutions for the project, apply acquired knowledge to design project products, participate in answering questions of lecturers and student groups.
- Secondly, skills: to know how to use the tools and materials to create products according to project requirements; to complete the product on schedule.
- Thirdly, attitude: to follow the tasks required by the group, fully participate in the group meetings with the spirit of cooperation, respect for the members of the group, etc.

Regarding self-evaluation form:

- Knowledge: knowledge gained after project completion, what ideas during the implementation, follow-up plans.
- Skills: skills are being used, and how to use it in the project implementation.
- Attitude: to evaluate the level of interest, cooperation, sharing ideas and information during group work.

In respect to evaluation plan, it includes lecturer's evaluation, Group evaluation, peer-evaluation, self-evaluation.

IV. CONCLUSION

Primary education has greatly contributed a major role in promoting economic development and sustainable development in each country. The study of the application of project-based learning methods in training primary teachers at Tay Nguyen University is a new direction in professional training and development. Because of the practical teaching, the study concludes that students are truly interested in participating in project-based learning so that they can easily acquire technical knowledge, cognitive, designing, and application competencies of the content of crafts, techniques, and other general competencies such as communication, cooperation, problem solving, scientific research capacity, etc. Further supported some previous studies, this learning process also takes place naturally not imposed by lectures or grades like the traditional way of learning. Based on the experimental learning in the project, numerous students have accessed to complex situations when implementing projects such as debates among members, dealing with constructive feedback and criticisms of their team members and between groups, or failure to implement the project, etc. It supports the hypothesis that it can help build the confidence for students to learn in the practice of teaching in the future. In addition, based on "Crafts and techniques" projects that do not stop at the end of their implementation whereas it will also be used as a tool in teaching other components of the teacher training program such as pedagogical training modules, methodologies, etc. Therefore, the application of project-based learning methods in teacher training and education is an effective new direction. In conclusion, the study continues to study this method in other aspects to find effective solutions to improve the quality of primary teacher training in particular, and professional training and education in general.

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