PRACTICALITY OF DIGITAL-BASED GYMNASTICS LEARNING DESIGNS DEVELOPMENT WITH IMPLEMENTATION OF PROJECT BASED LEARNING

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Abstract:
Preliminary research findings indicate that conventional gymnastic learning, as well as online media in the form of e-learning at the Department of Sports Education, Faculty of Sports Science, have not been able to develop students' basic gymnastic skills optimally. Therefore, digital-based gymnastics learning must be designed with the goal of facilitating and assisting students in comprehending learning materials and performing movement practices. This research was conducted, with the resulting output in the form of e-RPS and e-Module for learning gymnastics that met the valid, practical, and effective criteria for students of the Department of Sports Education, Faculty of Sports Science. The design of the e-RPS and e-Module is manifested operationally in the form of learning links, along with PDFs and videos. This research is Research and Development (R&D). The design construction process refers to the development of the Ploom model, which includes preliminary research, prototyping phase, and evaluation phase. According to the findings of the product development research on floor gymnastics learning media, it is possible to conclude that the practicality of the developed E-RPS and E-Modules based on student and lecturer assessments at the practicality stage, is very practical or easy to use.

Keywords: ***Digital, PjBL,*** **Senam**
DOI Number: 10.48047/nq.2022.20.19.NQ99212 ***NeuroQuantology2022;20(19): 2513-2521***

1. Introduction

The National Education System is governed by Law of the Republic of Indonesia Number 20 of 2003, which states that learning is a process of teacher interaction with students and learning resources that occurs in a learning environment. The three main participants in the learning process—students, teachers, and learning resources—are viewed as an interactive process that takes place in a learning environment on a national scale. Consequently, a system that consists of a unit of interconnected and communicative components that work together to achieve the desired outcome is what is described by the term "learning process."

The presence of educative interactions, that is, interactions that are aware of the purpose characterizes the learning process. This interaction, which is rooted in the educator's and students' pedagogical learning activities, progresses systematically through the stages of design, implementation, and evaluation. Learning happens over the course of several stages rather than instantly. Educators facilitate students' learning so that they can learn effectively. As anticipated, this interaction will result in an effective learning process (Dasopang (2014).

According to Trianto (2010), learning is a complex aspect of activity that cannot be fully explained. Learning can be defined as the result of a continuous interaction between development and life experiences. In essence, Trianto (2010) indicates that learning is a conscious effort made by an educator to teach their students (directing students' interactions with other learning resources) with the intention of accomplishing the objective. From the description above, it is clear that learning is a two-way interaction between educators and students, with directed communication toward a predetermined target.

Floor gymnastics is one of the lessons and lectures taught in the Physical Education, Health and Recreation Study Program. Gymnastics is a type of physical activity performed with a wide range of motion while wearing minimal and tight clothing so the physical movements can be observed more clearly (Edouard et al., 2018; Pitnawati et al., 2019; Zulbahri & Yuni, 2021). Gymnastics can be said to be a suitable physical activity to be used as a physical education tool based on the characteristics and structure of the movement because it is capable of contributing to the quality of motor development and physical quality. The characteristics of motion are very important in increasing the understanding of motion mechanics principles and natural laws that function on moving bodies. Gymnastic skills are always built on fundamental skills, which include: (a) locomotor skills that can be described as moving from one place to another, such as walking and jumping. (b) Non-locomotor skills are movements that do not move locations and rely on body joints to form different positions that remain at a single point, such as bending. (c) Manipulative skills include manipulating objects with the hands, head, and feet (Hedbávn, 2013; UPI Teaching Team, 2012; Zulbahri, 2020).

There are several movements that are used as practical teaching materials in gymnastics learning or lectures that students must do to pass this course, including round forward roll, straddle forward roll, round backward roll, straddle backward roll, straight backward roll, handstand roll, and wheeling. There are also supplementary motions in arranging gymnastic movements, such as handstands, headstands, tiger jumps, bridge stances, candlestick stances, airplane stances, and others.

Gymnastics is a mandatory subject for Physical Education, Health, and Recreation students if they want to graduate with a bachelor's degree. Gymnastics courses are also divided into basic gymnastics, rhythmic gymnastics, and gymnastics learning in the Physical Education, Health, and Recreation study program. Floor gymnastics is more commonly known as basic gymnastics. Students who decide to take gymnastics learning courses must first pass the basic gymnastics course with a minimum grade of B. This condition emphasizes the importance of a lecturer's role in conveying gymnastic material in order to achieve gymnastic learning outcomes that meet graduation standards. Furthermore, it is based on the student's interest and motivation in following the material. To maximize lecture results, lecturers and students must be able to work collaboratively to carry out learning more effectively, resulting in optimal student learning outcomes.

Students taking gymnastics courses and learning gymnastics for the past few years in the Physical Education, Health, and Recreation Study Program, Faculty of Sport Science, UNP have not achieved maximum results. Based on the results of this assessment, it can be concluded that the results of the examination of gymnastics lectures in the Physical Education, Health and Recreation Study Program are not optimal and are still categorized as low. As evidenced by the 67 students who took the basic gymnastics course from 2019 to 2021, only three people received the maximum grade of (A), nine students received a score of (A-), 18 students received a score of (B+), seven students received the grade of (B), nine students received the grade of (B-), and 21 students received a score of (T).

This is not limited to the higher education environment; it also occurs in schools, which are the first place for students to gain learning experience. According to observations and interviews with several educators and students of Physical Education, Health, and Recreation, it was very challenging to develop and conduct gymnastic lessons due to a lack of its learning facilities and infrastructure. Then there is the educators' lack of knowledge in providing learning designs to carry out gymnastic learning. Furthermore, there is a lack of gymnastics learning modules that are accompanied by methods and media that can assist students in improving their learning experience in gymnastics subjects. Additionally, due to the high risk of injury, lecturers are not overly demanding of students' abilities and skills in practicing gymnastic movements.

Gymnastics is described in lectures as a motor activity that must be practiced with extreme caution due to the high risk of injury. As a result, many students and learners are afraid, nervous, and anxious to perform the task. It is also due to the fact that many sports, health, and physical education teachers still do not master artistic gymnastics material, particularly the practical material, making it difficult for teachers to instill a strong sense of courage and motivation in students to practice it. Then, schools in the regions face challenges in developing gymnastic learning due to a scarcity of learning equipment that can be used as educational platforms, particularly in gymnastic learning. The initial solution to this problem was for regional teachers to obtain samples of movement material by downloading movement videos from YouTube. However, this has not contributed efficiently

to learning because most gymnastics media on YouTube does not yet include a more comprehensive explanation of the stages in the movement phase. It is the primary issue with learning gymnastics in schools.

In this study, a learning device is designed to address the aforementioned problems with product outcomes in the form of E-RPS (Semester Learning Plan), lecturer and student E-Modules that contain all parts of fundamental gymnastic learning based on the stages of motion and the phases of movement in more specific and detail. These materials provide comprehensive explanations, including text, audio, images, graphics, sound, and video. The design mechanism is to digitize learning materials with more up-to-date reading sources and through the development of basic gymnastics courses. The work concept gradually integrates text, audio, photos, graphics, sound, and video in each material. This study is beneficial to lecturers, teachers, and trainers because it can promote and facilitate the development of lectures and training. Both researchers and lecturers can benefit from this research by assisting students in the application of technology and information in learning, making the lecture process convenient and more enjoyable.

Furthermore, the development of gymnastic learning designs is expected to increase students' enthusiasm, motivation, and creativity in attending gymnastic lectures, resulting in an increased theoretical and practical understanding of gymnastic learning and producing maximum learning outcomes. Project Based Learning will be used to create the digital learning design (Kemendikbud, 2016). Project Based Learning is in accordance with the demands of the 21st century because it can improve higher-order thinking skills (Buck Institute Education, 2013; Patton, 2012). Furthermore, Project Based Learning has been shown to improve social-emotional competence and student achievement (Mahasneh & Alwan, 2018; Quint & Condliffe, 2018; Ummah et al., 2019). Project-Based Learning has also been shown to improve learning outcomes (Asy'ari et al., 2019; Siswono et al., 2018).

Learning that is well-designed can have an impact on the abilities that students will acquire. Designing learning involves describing how students interact with tools, media, or learning resources in order to collect and interpret information through a collaborative process (Oliver, 2007). This relates to how a teacher can design or set up learning activities in order to achieve the learning objectives. This, of course, cannot be separated from the facilities or resources used during learning for students to develop their understanding and abilities. Designing learning requires analyzing what is necessary and developing learning resources, abilities, and attitudes in a systematic manner (Sims, 2012).

Designing learning means answering three critical questions: (a) what students should have, (b) what students' current situation is, and (c) how students gain meaningful understanding (Montesori, 2005). In other words, the design highlights not only the process but also the learning conditions of the students. Learning conditions include learning resources, the environment, and the various activities that characterize the learning experience. It implies that teachers can design or develop the classroom learning process by concentrating on learning objectives, students' different learning styles, and approaches or methods for achieving these purposes.

Instructional design standards relate to theory and practice, research or evaluation that supports the method, how it is implemented, and how the design can be used in different learning contexts (Koper & Olivier, 2004). It serves as a resource for teachers looking for a grand theory to help them achieve their established learning objectives. In other words, the teacher can facilitate the learning process by focusing on the starting point (the student situation) and directing activities toward the endpoint (learning objectives).

Five principles that must be considered in designing learning (Merrill, 2002), including:

a. Problem oriented. Students are encouraged to solve real-world problems through learning.
b. Activation. Learning activates students' pre-existing knowledge.
c. Demonstration. Learning encompasses a variety of activities or instructions that students must complete.
d. Application. Learning encourages students to use their existing abilities to solve problems.
e. Integration. Learning encourages students to apply their prior knowledge or skills in the context of daily life.

Designing learning, according to this principle, denotes establishing a process to activate students' abilities to acquire new knowledge by solving contextual problems and being able to apply this knowledge in their daily lives.

The development of gymnastic learning designs using Project Based Learning will be developed to increase student creativity in producing digital learning

projects. The courses are more dominant online due to the demands of learning conditions during the Covid-19 global pandemic. Students will find it easier to access and open learning modules designed using applications such as Canva, pdf professional flipbook, YouTube, Google Drive, WhatsApp, Telegram, and other similar applications using computers/laptops and Android-based mobile phones as a result of the digitization process. Because the design of gymnastic learning in the curriculum was previously more conventionally developed, this study will also evaluate and compare the effectiveness of gymnastic learning designs with the application of Project Based Learning with conventional learning designs.

Students must be able to play an active role in building and constructing their own knowledge by seeking various ideas and concepts to produce a product in the form of media when developing gymnastic learning designs utilizing Project Based Learning. It is also completely compatible with a constructivism theory component in that students must construct their personal understanding (Dewey, 1938). The application of Project Based Learning to the development of exercise learning designs must also pay attention to the premise of initial cognition (initial knowledge) so that students can play an active role in building their very own knowledge. It is also consistent with the constructivism theory component in which learning can be constructed on prior understanding (Vygotsky, 1992).

Collaboration and group discussions are used in compiling, designing, and creating a project to produce learning products in the development of gymnastic learning designs using Project Based Learning. This statement is concurrent with a component of constructivism theory that states that learning must be done through social interaction between students and between students and lecturers (Bruner, 1961). Students are required to create projects that originate from real problems when developing gymnastic learning designs using Project Based Learning so that students can gain direct experience in working on projects to build valuable and meaningful learning. It is consistent with the component of constructivism theory, where students learn with real experiences to create valuable knowledge acquisition (Tam, 2000).

In developing gymnastic learning designs with the application of Project Based Learning, collaborative learning is also needed. Vygotsky's theory of social constructivism is the foundation of collaborative learning. According to Vygotsky, there is a zone of proximal development in a person, which is the distance between the actual level of development determined by independent problem-solving and the potential level of development determined by problem-solving with the guidance of senior individuals or in collaboration with more competent peers (Khoiriyah, 2016).

Social constructivism, a revolutionary theory, includes collaborative learning. Collaborative learning also aids in the development of gymnastic learning designs through the use of Project Based Learning. Students develop ideas and concepts through group discussions that are directly guided by the lecturer in this learning process which utilize a specific flow and approach. It is consistent with the concept of collaborative learning, in which ideas are developed through interactions between students, between students and lecturers, or between students in a social context. Collaborative learning is a progression or revolution in the theory of social constructivism (Chiong & Jovanovic, 2012; Pun, 2012; Tiantong & Siksen, 2013;). Furthermore, a learning process dominated only by the lecturers or educators results in a lack of student involvement in the learning process. This condition will lead to fewer opportunities for students to improve their critical thinking abilities. The necessity for collaborative learning is to encourage students to develop critical patterns of thinking because critical thinking skills are the foundation for students to understand concepts in learning material (Roosmalisa et al., 2016).

Gymnastics is a form of learning that can be designed collaboratively or PjBL in higher education institutions and schools. Gymnastic learning is one of the teaching materials encountered in physical education subjects that possess characteristics such as speed, static balance, and dynamic balance, as well as aerobic and anaerobic abilities in performing a series of floor gymnastic movements such as forward roll, back roll, bridge stance, candlestick stance, and so much more (Junaidi, 2017).

Gymnastics will also stimulate motor development. According to Kiram (2000), the concept of motion in motor learning is not only seen from changes in place, position, and speed of the human body performing actions in sports, but movements are also interpreted or seen as results or actual appearances of motor processes. Floor gymnastics, according to Isnaini (2010), are agility exercises performed without the use of tools. Floor gymnastics is a type of artistic gymnastics that combines various types of physical skills to showcase the complexity of motion, beauty of

motion, balance, mobility of motion, the strength of motion, and flexibility of motion to be demonstrated on the floor gymnastics field.

Floor gymnastics is one of the sports that rely on the activities of all limbs, both for other sports and for gymnastics itself (Muhajir, 2007). As a result, gymnastics is also referred to as a basic sport. Whereas in floor gymnastics, movement refers to movements performed in an integrated combination that is born from the ability of the motion or motor components of each part of the body such as speed, accuracy, agility, strength, balance, and flexibility. Gymnastics as it is described here is educational gymnastics. Educational gymnastics is a gymnastic term that refers to gymnastic learning with the primary goal of achieving educational goals (Mahendra, 2001).

Children learn at their own pace in educational gymnastics, developing understanding and skills in applying movement concepts (Mahendra, 2001). Furthermore, all of these abilities are only used to improve the child's mastery of movement in his own body while also improving the child's understanding of the underlying principles of motion. In learning gymnastics, different types of material are provided in one semester to provide students with mastery of gymnastic skills. The material is specified clearly in the Semester Learning Plan (RPS). The material comprises the definition of gymnastics, different types of gymnastics, gymnastics facilities and infrastructure, general physical conditions, special physical conditions, six dominant movement patterns, balance stances, candlestick stances, headstands and forward rolling movements, backward rolling, cartwheels, and handstands. Some of the movements can be seen in the image below:

Figure 1. Basic Artistic Gymnastics Movements

Then, for digital media in the following formats:

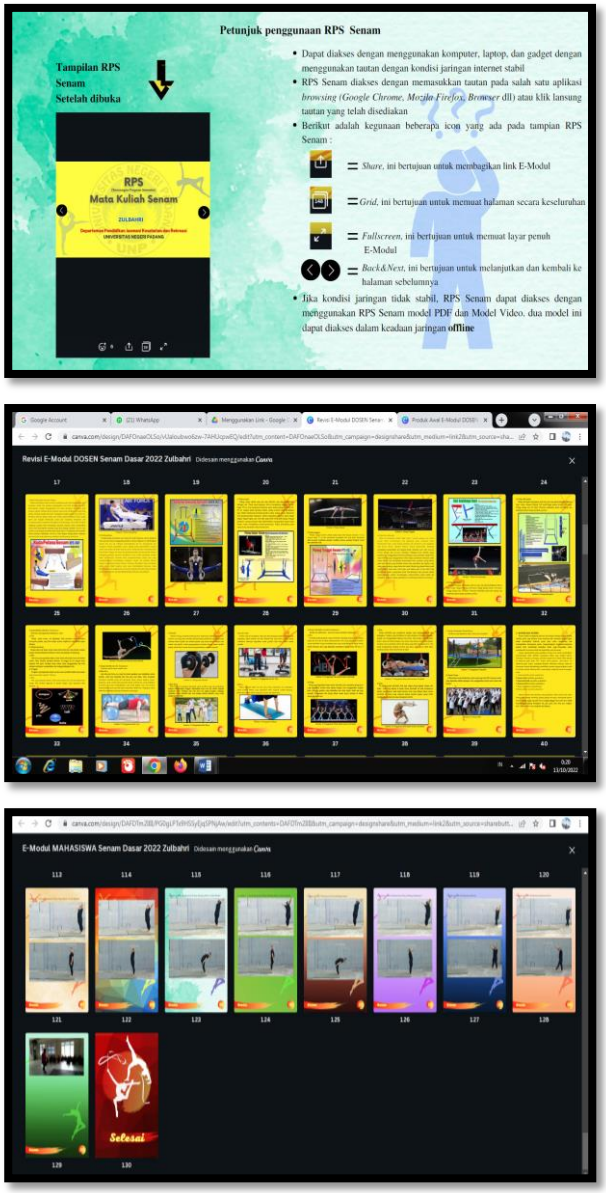

Figure 2: RPS and Digital Module Form

2. Materials and Methods

Research and development is the intended type of research. This type of research is used to establish or validate a learning product as well as to test its effectiveness (Sugiono, 2015). Moreover, the Plomp and Nieveen development design in gymnastics learning refers to three steps or phases, namely: a) preliminary research, which includes needs and context analysis, a literature review, and the development of a theoretical framework for intervention. b) The prototyping phase, a cyclical and sequential design process that employs formative evaluation to improve interventions. c) The assessment phase, also known as the summative evaluation phase, is used to determine whether the given problem-solving is satisfactory (Plomp & Nieveen, 2013).

This study focuses on the third prototype. Prototype three was acquired after prototype two was revised following expert advice. The following steps are taken to evaluate Prototype 3:

a. One-to-one evaluation is conducted using students with varying ability levels, including low, medium, and high abilities. Each of these students provided feedback on the creation of digital-based gymnastic learning designs. The lecturers of gymnastics courses were then polled for their thoughts on the development of digital-based gymnastic learning designs. The product is then revised based on the feedback.

b. Small group evaluation was carried out by conducting practical trials with a Digital-based gymnastics learning design that is the result of a revised development in two groups of 12 students. Students in the group were then asked to provide feedback on the development of Digital-based gymnastic learning models. In addition, the lecturers were asked for their opinions on the developed Digital-based gymnastic learning design.

3. Results

Six gymnastics students participated in the individual practicality test for prototype 3 in the one-to-one evaluation section, particularly section 202120860081. The one-to-one evaluation took place at the Department of Sports Education. Interviews with students on the practicality test of the e-RPS and the E-Module learning gymnastics were used to evaluate product prototypes. Meanwhile, the small group evaluation stage included 12 gymnastics course students from section 202120860310.

The small group evaluation was conducted at the Department of Sports Education. Product prototypes were evaluated through interviews with students on the practicality test of the e-RPS and the E-Module learning gymnastics. Subsequently, the lecturer analysis stage involved two lecturers who took gymnastics courses, specifically section 202120860081. The lecturer assessment was

conducted at the Department of Sports Education. Interviews with lecturers on the practicality test of the e-RPS and the E-Module for learning gymnastics were also used to evaluate product prototypes. Among the suggestions made during these stages are variations in the background display and instructions for using e-RPS and e-modules in the developing product. The following figure depicts the outcomes of the improvements:

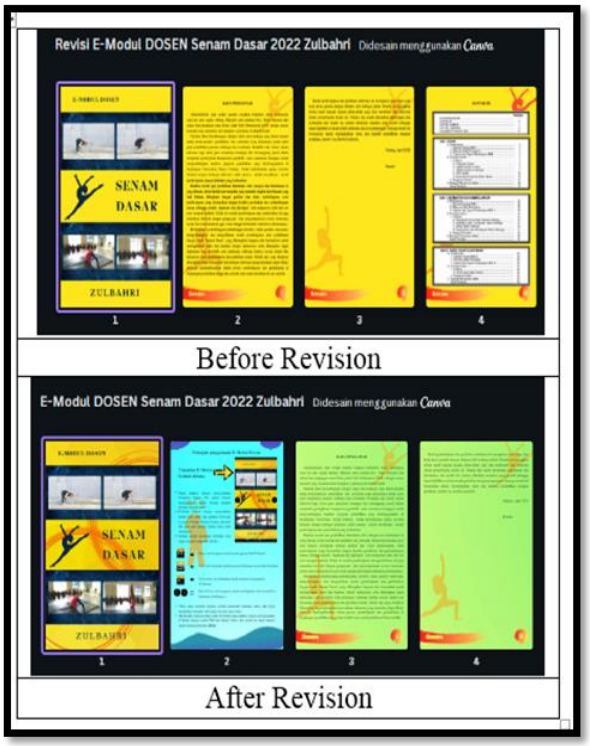

Figure 3. RPS and Digital Module improvements

Furthermore, the data in the following table is obtained based on the results of the assessment of the implementation aspects of the learning carried out on students:

Table 1. Practicality of e-RPS and e-Modules by Students

No	Assessed aspects	K	Criteria
1	Attractiveness	87,27	Very Practical
2	Usage Process	81,21	Very Practical
3	Ease of Use	76,36	Practical
4	Time	88,48	Very Practical
K average		**83,33**	Very Practical

As shown in the student learning implementation test results displayed in Table 1, the average value of implementing digital-based gymnastics learning is 83.33 with very practical criteria. It signifies that every student who evaluates the practicality of the E-RPS and E-Module suggests it is very practical or easy to use. The data is then obtained in Table 2 below based on the results of the lecturer's assessment of the implementation aspects of the learning:

Table 2. Practicality of e-RPS and e-Modules by Lecturers

No	Assessed aspects	K	Criteria
1	Attractiveness	90	Very Practical
2	Usage Process	80	Very Practical
3	Ease of Use	86.67	Practical
4	Time	80	Very Practical
K average		84,17	Very Practical

Based on the results of the lecturers' learning implementation test, shown in Table 2, the average value of implementing digital-based gymnastics learning is 84.17 with very practical criteria. It indicates that the lecturers who evaluate the applicability of the E-RPS and E-Module state that this media is very practical or easy to use.

4. Discussion

The results of the one-to-one evaluation stage practicality test revealed that the prototype 3 E-RPS and E-Module learning exercise products were well-rated by six students who had experienced the E-RPS and E-Module learning gymnastics. During the one-to-one evaluation stage, students as users give feedback and suggestions on the E-RPS and E-Modules, while the researchers spoke with students about the E-RPS and E-Modules that were used. This result is in line with the opinion of Tessmer (1993) that in the one-to-one evaluation stage the user reviews the learning while the evaluator (researcher) observes the user, records user comments and dialogues with the user during and after carrying out the lesson.

Based on the results of the interviews, participants gave positive responses to the development of E-RPS and E-Modules in gymnastics learning. Question 9, 'Can student E-RPS and E-Modules help to understand the mobile phases?' received a positive response. The E-RPS and E-Module were helpful to the six students who were tested in the one-on-one evaluation stage. In the sense that the E-RPS and E-Modules assist and motivate students to learn.

The results of the small group evaluation revealed that the prototype with E-RPS and E-Module products

received positive feedback from all 12 students. One of the positive responses to the question, "Are the assignments presented in student E-RPS and E-Modules making it easier for students to construct knowledge?" The 12 students who were tested during the small group evaluation stage responded positively. Similarly to the previous discussion, students feel helped and motivated to learn when using the E-RPS and E-Modules.

Students' responses to the practicality questionnaire after completing digital-based gymnastics learning were considered satisfactory. Users respond positively, indicating that the qualified gymnastics E-RPS and E-Modules are very useful. During the trial activities, the researcher noticed that students as users appeared passionate and enthusiastic about performing the learning stages using the E-RPS and E-Modules. It is reinforcing the evidence that the E-RPS and E-Module are beneficial for learning.

The results prove that the application for learning gymnastics is simple to use for students. According to Nieveen (in Plomp, 2010), the level of practicality of learning media will be said to be practical if (1) it is applicable in the field according to practitioners and (2) the level of implementation of learning media is in a decent category. Based on this, it denotes that the E-RPS and E-Modules used in gymnastics learning based on Android in the form of gymnastics learning applications fulfill the very practical aspects.

5. Conclusions

Based on the research results of the product development research on floor gymnastics learning media, it can be concluded that the practicality of the developed E-RPS and E-Modules based on student and lecturer assessments at the practicality stage is very practical or easy to use.

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