

Optimizing Differentiated Learning in Physical Education Subjects: Utilization of Information and Communication Technology (ICT)

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Abstract

Study Purpose. The research explores the effectiveness of differentiated learning strategies in addressing obstacles encountered by students in physical education. It focuses on tailoring teaching methods to accommodate individual differences in readiness, learning profiles, and interests, aiming to enhance engagement and learning outcomes.

Material and methods. Using qualitative methods, including interviews and observational analysis, the study investigates the impact of differentiated learning, particularly through the use of Information and Communication Technology (ICT) in rhythmic gymnastics instruction. Observations suggest that video-assisted instruction increases student interest and engagement, facilitating self-reflection and promoting autonomy.

Result. The findings highlight the positive influence of differentiated learning on engagement and learning outcomes, promoting equity and inclusion in the classroom.

Conclusions. The study underscores the importance of adapting teaching methods to meet students' diverse needs, ultimately contributing to their overall well-being in physical education and beyond.

¹**Keywords:** Physical Education, Differentiated learning, ICT utilization

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Introduction

Physical education is one of a compulsory subject that has to be followed and participated by the students in schools. This subject can be found start from elementary to senior high school levels. This is a proof that this subject is very important to be taught by the teacher and participated by the students actively.

The importance of physical education for students can be impacted directly to their bodies and mind. Ericsson (2014) mentioned that physical activities play an important role in student's development in part of body and soul. By participating in physical education activities, it will health the student's social life. They can strengthen their friendship while doing activities in the field. The student's fitness because of the movement that they make also increase rather than they stay in the classroom. Another quality that can be impacted to the students is about

teamwork. in (Ericsson 2014) stated that it is important for the students to participate in physical education activities when it comes to the terms of acquiring friends, maintaining friends, and belonging in peer groups.

Despite of the importance of physical education to the student's life. It is not an easy process for most of the students in learning physical education. There are so many obstacles in learning physical education faced by the students in the school. One of the problems is the difficulties in understanding some materials which are delivered by the teacher. The other obstacles are related to the student's motivation and interest in learning. Those obstacles impacted on the difficulties on the solving of the assignment that the teacher give. Those problems are also experienced by the students in SMA N 2 Mandor.

Every student is different in terms of their ability in learning. There are some students who can be categorized as active learners and passive learners. There are also some students who are categorized as fast learners and slow learners. At the same time, students' differences in learning styles also impede the success of physical education learning activities. For example, there are some students who prefer to learn by movement (kinaesthetic learning), students who are comfortable in learning through seeing (visual learning), and there are some students who are easy to understand by listening to their teacher's explanation. Syofyan and Siwi (2018) stated that visual learner students learn through what they see, auditory students learn by hearing, and kinaesthetic students learn through movement and sense of touch.

The combination of learning difficulties faced by the students, and the differences of learning style that the students have can give huge impact to their learning achievement. The burden of successful learning is become higher if the teacher uses inappropriate learning strategies. That is why the choosing of learning strategies should be accordance with the factual condition of the students. So, the researcher used Differentiated learning to make the poses of physical learning activities running smoothly.

According to Tomlison (2000) Differentiated learning is an effort of adjustment to learning mechanism in the classroom, so the students' learning need can be fulfilled. It was also stated that Differentiated learning is a method or the teacher's effort to fulfill the students need and hope of learning (Wiwin Herwina, 2021). In other words, this method can help the teacher to deal with the students need who are varied from one to each other. By using this kind of leaning method, the teacher can anticipate the variation of activity based on the students readiness and interest at that time.

Differentiated learning is considered to a result of a thought from Ki Hajar Dewantara, that education should give guidance in every power of nature that children have so they can achieve the security and happiness as a human and society (Wiwin Herwina, 2021). That is why, the force of the power nature on children must be guided by educators so it can grow well, and educators only can fix their behaviour but not the basis.

In its context, Differentiated learning is a learning approach which accommodate the students' need. But it doesn't mean that through Differentiated learning, the teacher should use 30 different ways of teaching for 30 students in a classroom. Differentiated learning is a series of logic decision which created by teacher with the adjustment of students hope. In Differentiated learning the teachers are expected to have new breakthrough in choosing the model, strategy, and learning method so the students more motivated to follow the learning flow. Based on that in order to increasing the learning quality in the classroom, the teacher's role is very crucial as a determiner the succeed of the learning (Wiwin Herwina, 2021).

According to Tomlison (2000) the category of students' need in learning is consist of three aspects such as readiness of the students in learning, students' learning profile and, students interest. There are at least 3 Differentiated learning strategies that can be a teacher applied in learning such as content differentiated, process differentiated, and product differentiated. The content associated with what is delivered to the students, while the process directed to a flow

or the way of learning, and the product is related to the result of a work or work method which in form (tangible) produced by the students in form of text, presentation, record, picture, test result which described in diagram and related to the expected learning objectives. The product differentiated cover 2 things namely to give challenges and diversity or variation to the students, and to give option to the students in how they can experiment the expected learning. It is important for the teacher to choose the students' expectation for example the work quality, the content that must be in the product, how to do it, and what kind of product that was expected to produce.

The three things (content, process, and product) don't always have to show it as a whole or together, we just simply choose one or several differentiations that are considered appropriate in the learning that the teacher will convey. To realize Differentiated learning in accordance with current developments, the use of Information and Communication Technology (ICT) media is considered appropriate to answer the challenges of physical education learning which has been considered monotonous and boring.

The purpose of this research is to investigate the effectiveness, impact, and outcomes of differentiated learning in a classroom setting involving 24 students. Specifically, the research aims to explore how differentiated instruction, which tailors teaching methods and content to accommodate the diverse needs, interests, and abilities of students, influences student achievement, engagement, and overall learning outcomes.

Material and methods

The research used is qualitative in nature to find out how the optimization of Differentiated learning in physical education subjects using ICT. The data excavation was carried out through in-depth interviews with the object or informant in the study, as well as by making exclusive observations on how the research object translates its experience to others. This study involved 24 students of class XII science at SMA Negeri 2 Mandor. In Differentiated learning on physical education subjects, the researcher chose rhythmic gymnastics material by mapping learning needs based on students' interests, by choosing 2 Differentiated strategies, namely the process and the product. In the Differentiated process, the researcher presents 2 Differentiated process, namely in the form of direct practice of rhythmic gymnastics and the second asking students to watch rhythmic gymnastics videos via You tube. While in product differentiated, the researcher asked students to design rhythmic gymnastics in groups but with 3 alternative ways of presenting it, namely; the teacher asks students to practice gymnastics movements directly in front of the class, the teacher asks students to make a gymnastics video that is edited using a video editing application and collected directly via Bluetooth or email, and the students are asked to make a gymnastic video then do the editing process using a video editing application, after that students are asked to upload the video on their respective social media. After uploading the video, students collect the assignment by sending a video link to the class WhatsApp group.

To map research results based on process differentiation, data analysis was used through natural observation by collecting information based on the number of students who chose to study the material through direct practice (Group A) and the number of students who chose to study the material through video assistance (Group B). The way to obtain the percentage is by calculating the number of students by group divided by the total number of existing students (24 students) x 100. Meanwhile, to analyze the results based on product differentiation, students are divided into 4 groups where each group is given the freedom to choose how to collect assignments (products), namely showing the gymnastics directly (first option), showing the gymnastics via video then sending the video results directly (second option) and the third option by showing the gymnastics via a video uploaded independently on YouTube and sending the results of the assignment in the form of a link that has been embedded on YouTube user. To

find out the results, you need to count how many groups chose the task using the first choice, second choice and third choice. These results are translated into percentages using the formula for the number of groups in option 1, option 2 and option 3 divided by the total number of groups (4 groups) times 100.

Results

Through observations on Differentiated learning applied to physical education subjects by utilizing ICT in class XII IPA SMAN 2 Mandor, many students feel more interested in learning rhythmic gymnastics material through videos shown by the teacher in front of the class. As Bouazizi, *et al* (2014) noticed that learning gymnastic by using video modeling can give positive improvement to the student's ability. By viewing directly the sequence of the gymnastic movement can develop the student's cognitive representation of the student's movement cited in Bouazizi *et al.* (2014)).

Besides the use of video in learning process can make the students being able to understand the contents of the entire material presented, the way of the teacher evaluates the students practice through video also can give positive impact to the student's performance. When the teacher asks the students to perform in front of the teacher directly, they tend to feel awkward or embarrassed if they must practice the movements directly in front of their classmates. That is why, when the students are asked to record their movement to be evaluated, they become more relaxed and all out in their performance.

The teacher cannot neglect the students feeling of awkward because they are become the teacher's attention, and the feeling of nervousness while being evaluated. It can influence the student's performance negatively. Regardless of impairing overall health and well-being, depression and anxiety symptoms can further adversely affect academic achievement cited in Pascoe *et al.*, (2020))

Moreover, by asking the students to record a video of their practice can make the students see their own performance as self-reflection. The students can aware whether their performance good or need more effort to make it as the teacher expectation. Tursini (2012) mentioned that video recording can be used as tools of mirror for reflection that allow the student to see and assess their own instructional practices. The result of the mapping the learner needs can be seen based on the following table:

Table 1. Observation result of process Differentiated

No	Gender	The mapping of learning needs based on interest		Total
		Rhythmic gymnastics practice	Through YouTube video	
1	Male	1	10	11
2	Female	4	9	13
	Total	5	19	24

The mapping based on student's interests with a process Differentiated strategy of 5 students or 20.83% of students chose the material through direct practice of gymnastics. While 19 students or 79.17% of students chose the material through video. It was supported by Al-Haliq, Oudat, and Al-Taieb (2014) who mentioned that teaching and learning through video can give benefit for the teacher to motivate and increase the students interest trough the sense of seeing and hearing. Moreover the practice of gymnastic can be more live for the students if they can see directly the performance by the expert along with the refreshing soundtrack.

While in product Differentiated, none of the groups chose to practice directly in front of the class, while 1 group chose to send assignments by collecting videos via Bluetooth or email and

3 groups chose how to collect assignments by sending video links that had been uploaded on social media. Penteadó, Cesar, and Da (2021) stated that producing video in the classroom can be done to anticipate the dilemmas, challenges, and perspective concerning the pedagogical process. Indirect performance evaluation by using video can decrease the student's negative feeling occur because of the teacher's evaluation. The result of the students need about using videos for their performance evaluation can be seen on the following table:

Table 2. Observation result of Product Differentiated

No	Group	The mapping of learning needs based on interest		
		Direct Practice	Direct Video	Video Link
1	Group 1	-	v	-
2	Group 2	-	-	v
3	Group 3	-	-	v
4	Group 4	-	-	v
	Total	0	1	3

3 out of the 4 groups or 75% chose how to collect assignments by uploading videos on social media and sending video links to the teacher, 1 group or 25% chose how to collect assignments by sending videos via Bluetooth or email. From Differentiated learning in Physical Education subjects using ICT, it is not to compare students' learning abilities but to meet students' learning needs based on interests so that learning objectives can be achieved (Ismaniati, 2010).

Discussion

Differentiated learning research encompasses a broad spectrum of studies aimed at understanding the effectiveness, implementation, and outcomes of this pedagogical approach. Through various research endeavors, scholars and educators seek to uncover the impact of differentiated learning on student achievement, engagement, and overall learning outcomes. Here, we delve into the key aspects and findings of research on differentiated learning:

1. Effectiveness of Differentiated Learning:

Numerous studies have investigated the effectiveness of differentiated learning in diverse educational settings, from elementary schools to higher education. Research consistently demonstrates that differentiated instruction leads to improved student achievement and engagement. By catering to individual learning styles, interests, and readiness levels, differentiated learning enables educators to meet the diverse needs of their students more effectively. This personalized approach fosters deeper understanding, enhances motivation, and promotes positive attitudes toward learning.

2. Implementation Challenges and Strategies:

While the benefits of differentiated learning are well-documented, researchers also highlight the challenges associated with its implementation. These challenges include time constraints, resource limitations, and resistance to change among educators. Research suggests that effective implementation of differentiated instruction requires ongoing professional development, support from school leadership, and collaboration among teachers. Strategies such as pre-assessment, flexible grouping, and tiered assignments have been identified as effective means to address these challenges and promote successful implementation of differentiated learning.

3. Impact on Student Equity and Inclusion:

One of the key advantages of differentiated learning is its potential to promote equity and inclusion in the classroom. By acknowledging and accommodating the diverse needs of

students, differentiated instruction helps to level the playing field and ensure that all learners have access to high-quality education. Research indicates that differentiated learning can be particularly beneficial for students with diverse learning styles, English language learners, and students with special needs. By providing multiple pathways to learning, differentiated instruction empowers students to succeed regardless of their background or abilities.

4. Future Directions and Areas of Exploration:

While differentiated learning research has made significant strides, there are still areas that warrant further exploration. Future research could focus on the long-term effects of differentiated instruction on student achievement and academic outcomes. Additionally, there is a need for more studies examining the impact of differentiated learning in specific subject areas, grade levels, and cultural contexts. Furthermore, research on the integration of technology and digital tools to support differentiated instruction represents a promising avenue for future inquiry.

Conclusions

Differentiated learning research provides valuable insights into the effectiveness, challenges, and potential of this pedagogical approach. By examining its impact on student achievement, engagement, equity, and inclusion, researchers contribute to the ongoing conversation surrounding effective teaching practices. As educators continue to strive for excellence in the classroom, differentiated learning research serves as a guiding light, informing best practices and driving innovation in education.

From differentiated learning in Physical Education subjects through the use of ICT, it is not to compare student learning abilities but rather to meet student learning needs based on interests so that learning objectives can be achieved as a whole.

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