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An Analysis of Students' Intrinsic and Extrinsic Motivation in Virt Practicum of Science Learning for Prospective Islamic Elementary Sch Teachers

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Abstract The purpose of this study was to analyze the intrinsic and extrinsic learning motivation of MI/SD (Islamic Elementary School/Elementary School) teacher candidate students when conducting virtual practicums. This is a survey research with a quantitative approach. The data collection instrument used was a validated questionnaire. The research samples consisted of 71 students from semester 5 of the PGMI Study Programme (Madrasa Ibtidaiyah Teacher Education) who programmed the MI/SD Basic Science Concepts Course. Data were descriptively analysed using percentages. The analysis of students' intrinsic motivation in the virtual practicum of MI/SD Science learning yielded the highest proportion of self-determination. The aspect of talent is the acquisition of the lowest percentage of intrinsic motivation. According to the study's findings of student extrinsic motivation, the aspect of friends receives the highest percentage when compared to the environmental and familial aspects. Overall, external factors are more dominant than student internal factors in the use of virtual labs.
Keywords: Extrinsic Motivation, Intrinsic Motivation, Science Learning, Virtual Practicum.

INTRODUCTION

An interactive educational environment utilising technology in learning media must be supported by new psychological and pedagogical development (Kruchinina et al., 2016). The use of technology in learning can be applied not only to distance learning but also to face-to-face learning in the classroom. The use of virtual practicums or virtual laboratories to carry out various forms of Natural Science practicums using certain applications, such as PhET (Physics Education Technology), is one example of technology utilisation in the issue.

A laboratory is a place for students to carry out observations, experiments, and test concepts. Students can make direct observations and have independent experiences of feeling what they are learning (Berlian et al., 2023). Because of constraints and limitations in the use of physical laboratories, the availability of a virtual laboratory can be a solution for achieving learning objectives following the core skills used. Because virtual laboratories can be accessed at any time and from any location, they can effectively solve learning obstacles caused by procurement issues and material costs (Astuti et al., 2022).

The goals to be reached, as well as the learning motivation of students, will impact practicum activities and the teaching and learning process. Motivation is essential in learning activities. High levels of learning motivation will result in high levels of student accomplishment (Agustina, 2015). Because it combines observational and experimental activities that use the five senses, practicum activities in learning Natural Sciences may improve students' enthusiasm to learn Science (Aminullah & Masnur, 2019). This can be seen in online practicum activities as well.

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Several prior research has indicated that integrating virtual practicum affects students' learning motivation. Darwis & Hardiansyah (2021) used the PhET virtual laboratory to study rectilinear motion physics material and found differences in student learning motivation between students who studied natural science using the PhET virtual laboratory practicum and students who studied natural science conventionally. The use of PhET as a simulation medium in science learning not only boosts motivation but also influences students' problem-solving abilities (Susilawati et al., 2022). Furthermore, Muzakkir et al. (2015) discovered that implementing a virtual laboratory-based inquiry practicum improved student motivation and creativity in simple harmonic motion material.

Because virtual practicums can boost students' learning motivation, Ikhsan & Afdal (2016) concluded that virtual lab software can be utilised as an option for schools that do not yet have a chemistry laboratory. This corresponds to the findings of the excretion system Virtual Laboratory product development trials conducted by (Adi et al., 2017). Virtual learning is one of the learning strategies that is currently being widely used in conjunction with technological advancements as part of the post-pandemic adaptation results (Syar, 2022).

Motivation is classified into two categories: intrinsic and extrinsic (Reiss, 2012). Interest, delight, and inherent motivation are examples of intrinsic motivation, according to Ryan & Deci (2020). Furthermore, playing, exploring, and other activities that inspire interest are examples of intrinsically motivated behaviours because they do not rely on outside pressure but bring satisfaction and joy in and of themselves. External regulation (external reward/punishment, compliance, reactance), introjection (ego involvement), identification (personal importance), and integration are the four basic indications of extrinsic motivation.

This study employs PhET as a laboratory where virtual practicums in many natural scientific materials such as Dynamic Electricity and Force, Motion, and Energy are held in the MI/SD scientific Basic Concepts course. The application of science learning for PGMI IAIN Palangka Raya Study Programme students for the topic of Style and Motion employing a virtual practicum technique using PhET simulations of science process skills yielded fairly good results (Nahdiati et al., 2023). The purpose of this study is to analyze the differences in intrinsic and extrinsic learning motivation of MI/SD teacher candidates when conducting virtual practicums.

METHODS

This study employed a quantitative approach to survey research. This study included 71 students from the 5th semester of the Madrasah Ibtidaiyah Teacher Education Study Programme at IAIN Palangka Raya who programmed the MI/SD Basic Science Concepts Course. This study included a sample of all of these students.

The researcher employed a reliable questionnaire as a data collection instrument. Intrinsic motivation factors include mastering objectives and the urge for achievement, which are split into six categories: interest, enthusiasm, will, talent, development, and ability. Extrinsic motivation includes expectations from friends, family and the environment.

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The number of questions in the questionnaire is 14 which are statements in the positive category. Technically, respondents will be given a questionnaire composed of questions that are measured using a Likert Scale. Respondents answered the questions according to the conditions on the Likert scale of 1 to 4. Strongly Disagree (STS), score: 1, Disagree (TS), Score: 2, Agree (S), score: 3, Strongly Agree (SS), Score: 4. Then the results of filling out the questionnaire were analyzed descriptively using the percentage formula.

Score interpretation adopting Riduwan's Categorization in (Waruwu, 2017).

0% - 20% : Very weak
21% - 40% : Weak
41% - 60% : Sufficient
61% - 80% : Strong
81% - 100% : Very Strong

RESULT AND DISCUSSION

Learning motivation is one of the most significant factors that teachers must consider to attain a learning goal. According to the data analysis results, the learning motivation of Madrasah Ibtidaiyah Teacher Education students differed for each group, both on the intrinsic and extrinsic levels. Figures 1 and 2 show the findings of the analysis.

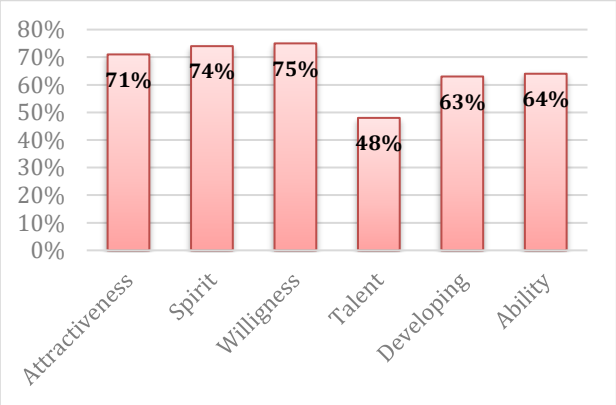

Figure 1 The Analysis Result of Students' Intrinsic Motivation

Figure 1 shows that internal motivation on the part of "self-will" has the greatest average value, equivalent to 75% when compared to the values of other motivational aspects. However, with a percentage of 74% in the strong category, this percentage achievement is not far from the "interest" element. This demonstrates that the key element impacting student motivation in virtual practicums in the MI/SD Science Basic Concepts Course is their inner will and enthusiasm to participate in virtual practicums. Students are interested since the virtual practicum method is novel to them. This virtual laboratory makes use of engaging and interactive simulation media to boost students' enthusiasm and willingness to learn.

Students in this study used PhET to conduct a virtual practicum. The PhET Colorado interactive simulation is one of the engaging, discovery-based interactive simulation media in

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Natural Sciences learning that may be utilised to clarify physical concepts or phenomena that students will study (Ramadani & Nana, 2020). Fun, interactive, competitive, and recently utilised systems or applications will help to enhance the level of intrinsic motivation, allowing them to engage students as a whole, including emotional involvement and focused attention (Sun & Hsieh, 2018).

According to Kruchinina et al. (2016), motivation is something that pushes someone to perform something or engage in a specific activity. One of the most fundamental aspects of communicating one's objectives is purpose. Motives are carried out in the form of activities to achieve relevant goals, according to psychology. In this case, the goal is intimately tied to the student's self-will.

Talent, with a percentage of 48%, is in a rather strong area and has the lowest value when compared to other aspects. A person's talent is their potential ability to succeed in the future. Essentially, everyone must have the skill or the capacity to accomplish at a high level (Novianti et al., 2020). However, among prospective MI/SD teacher students, talent in the use of simulation media or IT-based applications is still scarce.

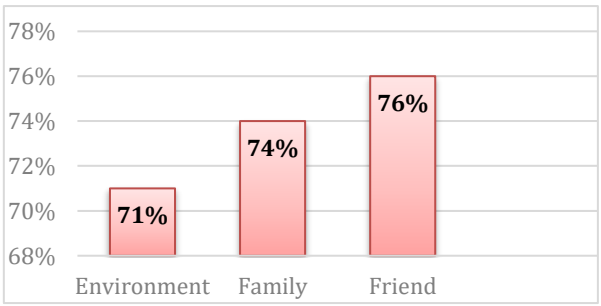

Figure 2 The Analysis Result of Students' Extrinsic Motivation

All aspects of extrinsic motivation are considered strong. The need for learning motivation has the highest value in the friend component in extrinsic motivation. Students prefer and desire to demonstrate their cohesion by participating in virtual practicums with their friends. Friends are the most important factor for PGMI students participating in virtual practicum. It is because this is what they encounter the most during lectures. Furthermore, buddies serve as practicum work partners for students.

Peer social contact influences student motivation. This suggests that the more pupils interact socially, the more motivated they are to learn. When students communicate with their peers, they are more likely to be motivated to learn (Damayanti et al., 2021). Virtual practicums are done in groups, therefore even though they are done remotely or online with face-to-face meetings in class, interactions with classmates or groups have an effect.

Sumia et al. (2020) discovered a relationship between the role of peers and self-regulation in student learning. This demonstrates that peer admiration and attention motivate individuals to strive to achieve their learning objectives.

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Overall, external forces outnumber internal factors. The average intrinsic motivation percentage is lower than the average level of extrinsic motivation. According to Diseth et al. (2020), this discrepancy happens for a variety of reasons, including, "..there may also be an increasing prevalence of rewards and other extrinsic contingencies for students during their secondary school years".

Lemos & Veríssimo (2014) discovered an intriguing occurrence associated with these two types of motivation. Both intrinsic and extrinsic motivation can have a positive impact on academic achievement, and they are independent variables. A developmental trend demonstrates that the impact of extrinsic incentives is obvious, where extrinsic motivation does not impair intrinsic motivation and can even improve intrinsic interest and academic achievement in low-grade students. However, from the upper grades to the conclusion of elementary school, types of encouragement might weaken children's inherent interest and achievement.

There is some disagreement with the view (Hayamizu, 1997) that extrinsic and intrinsic motivation are not mutually exclusive. It is supported by Saeed & Zyngier (2012) there are situations in which teachers can use both sorts of motivation at the same time. Teachers might explore employing extrinsic motivation to improve students' intrinsic drive if intrinsic motivation does not work. Intrinsic motivation promotes students' true commitment to learning, while extrinsic motivation fosters students' ritual involvement.

CONCLUSIONS

The analysis of students' intrinsic motivation in the virtual practicum of MI/SD science learning shows that the average aspect is in a strong category, with self-will having the highest percentage. The aspect of talent is the acquisition of the lowest percentage of intrinsic motivation. According to the findings of the study of student extrinsic motivation, the average component falls into the strong category. Friends aspects receive the largest percentage (76%), followed by environmental and family aspects. Overall external factors are more dominant than student internal factors in the use of virtual practicums in the MI/SD Science Basic Concepts Course.

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