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Research article

High School Students' Interest in Choosing Physics as a Major in College

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Abstract.
The declining number of students choosing physics as a major in college has now become a challenge for many Indonesian universities. Students' interest is an important factor influencing their choice. This research explores and describes students' interest in choosing physics as a major in college by employing the descriptive method. The study population was all Class-XII students of high schools in Gowa Regency, of which a sample of 90 students from six high schools – three public and three private schools – was selected. Data were collected through a questionnaire and analyzed quantitatively. The results of the analysis showed that a majority of the students (58%) had a "low" level of interest in physics and only a few (3%) were highly interested. This shows that most high school students in Gowa Regency are less interested in choosing physics as their major in college. The current research expects to serve as a basis for further research in increasing students' interest in physics education in college.

Keywords: students' interest, physics education department, higher education

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1. Introduction

Based on the data taken from DIKTI database, the number of universities continues to increase every year, both in public and private universities. The increasing number of universities causes competition in the education system in terms of human resources, student admission strategies, and the service system. Superior universities must be able to develop their education system, so that they can produce graduates who have good professional, intellectual, personal, moral and social competences [1, 2]. In addition, university graduates which hold the highest educational degree are always used as a standard of recognition for intelligent people in the community. A graduate's competences describe the quality of a university, especially the department to which he belonged to. Therefore, before choosing a major in higher education, it is necessary to have good considerations, so that when you become a graduate, you can become a good attribute for the department.

The large variety of major choices in college often makes it very difficult for a person to determine the right major for him, so that many of the students choose a major that does not match with their interest. There are three types of people in choosing a major: first, those who choose a major based on their interests; second, those who choose a major as a part of their strategy; and third, those who choose a major because they are not interested in the major [3]. The selection of majors in higher education must be in accordance with what is desired, promoting students' talents and interests, so that carrying out the process will not become a burden [4]. A person's interest in a major can describe how job preference, choice of college majors, and future life goals [5]. The selection of majors in higher education begins in the final grade of high school, where students start to mess around with the majors they will choose later in college. In determining the choice of majors, students always include opinions from various parties such as parents, peers, even from the views of outsiders as reference material. The encouragement of parents and the environment greatly affects the determination of students' choices towards a major [6]. However, the interests and abilities of students should be the main basis in determining the chosen major. By doing do, the choice can have a positive impact on the learning process later. The importance of the interests that students have in a major is not effective when there is no positive encouragement from parents and the surrounding environment.

Physics Education is one of the majors in higher education. When a student decides to take this major, he must consider their interests in this fields as the materials in physics courses are considered difficult to understand by most students [7] so that this major is way less attractive. Students who have an interest in the chosen major tend to master the lessons more easily in that department. The interest here means the desired major, the thing that makes them pay more attention to the Department.

In addition, the data from Kemendikbud showed that the number of capacity and applicants of Physics Education majors in Indonesian universities in the last three years has decreased drastically. The data depicts that there are only two out of eight State Universities offering Physics Education Departments had more applicants than the provided capacity, at least for the last three years starting from 2018-2020. Meanwhile, in the other six state universities, the number of applicants has falling significantly in the last three years [8].

The above situation is supported with the results of interviews with 5 high school principals in Gowa Regency revealing that based on the search for alumni from their respective schools, their alumni generally chose to continue their studies at universities in non-education and non-science majors, especially Physics Education. Of the

5 schools with hundreds of alumni, only 12 of their alumni chose to study majoring in physics with 8 people choosing Physics Education and 4 people choosing Pure Physics. Moreover, the results of interviews with 7 physics teachers showed that when studying physics in class both online and offline, students looked less enthusiastic, especially when they need to work with formulas and calculations. Physics materials which basically need evidences requires students to master and understand existing concepts better [9]. This is also the trigger for the declining interest of students in the physics education department.

Based on the problems above, it is necessary to approach students to grow their interest in the Department of Physics Education. Given the importance of students' interest in choosing majors in Higher Education, the researchers conducted a study to further describe how is the interest of class XII students in Gowa regency towards the Department of Physics Education.

The results of this study are expected to be a reference material in finding appropriate solutions to overcome the problem of declining student interest in the Department of Physics Education. This can also be the basis for researchers themselves for further research in increasing students' interest in the Department of Physics Education, which can indirectly improve the quality of education in Indonesia in general and especially at the university level.

Interest is a sense of desire that an individual has in an object, without external coercion [10, 11]. Interest in a person will be present when someone wants or is interested in an existing object so that it will give more attention to the object [12]. This is in line with what was stated by Crow and Crow that interest is directly related to a person's attitude in dealing with people, objects, activities and experiences resulted from the activities (Crow & Crow, 2005). Someone who has an interest in certain activities, indeed, has more concerns on those activities compared to other activities [10].

Basically, a person's interests arose since his childhood and most probably do not change until his adulthood [13], but environmental factors such as socio-cultural, psychological, and background can affect the development of one's talents [14]. Thus, interest is divided into two perspectives, namely interest as a person's characteristics (personal interest) and interest as a psychological state that is influenced by the environment (situational interest) [15, 16]. Personal interest is an interest established inside a person and forms the desired characteristics [17] and can affect a person's motivation for an object [13, 18]. Meanwhile, situational interest is the interest that is influenced by the environment [19, 20]. Thus, it can be concluded that interest can be influenced by the

circumstances and nature of a person which can change according to existing situations and conditions [21].

Deciding a major in higher education is crucial as it is the beginning of determining one's career in the future. Therefore, a student must think about it well by taking their interests into account. Interest in a certain major is a person's interest in a major that will be chosen based on internal influences and environmental influences based on the situation. A positive interest in what one chooses will affect how successful one's career and life will be in the future [22, 23]. So it can be said that interest is a strong factor in the context of life both in the field of education and in the world of work [24].

The Department of Physics Education is one of the majors in Higher Education that prints prospective educators in the field of Physics. In this department, apart from studying physics materials, this department also trains students to transfer the knowledge they have acquired to students in school later. Materials in physics are more emphasized on theories that contain facts, laws, principles, concepts, and postulates. This is what causes many students to dislike physics because they think that physics is very difficult to learn [25, 26]. In addition, physics material at the university level has a high level of difficulty compared to physics material at school. Thus, students are required to have strong understanding in studying the physics material.

The Department of Education also requires students to be able to master the techniques of transferring their knowledge, and they must also have the ability to teach in the classrooms. In fact, only a few students choose careers as teaching staff [27], so that it becomes one of the triggers for the lack of students choosing majors in the field of Education. Moreover, the courses in that department become one of the determinants for students in determining their choice.

2. Research Methods

This research is a descriptive quantitative research. This type of research tries to answer research problems that emphasize the questions "how, what, when, and where", not on the question "why". In other words, it aims to describe aspects of a population, situation, or phenomenon in the field [28]. This method is very suitable to be used in this research because it is in accordance with the desired research objectives, namely, to describe the profile of interest of class XII high school students in Gowa Regency towards the Physics Education Department.

The population in this study were all students of class XII SMA in Gowa Regency. Purposive sampling was used to take samples out of the population, namely drawing

samples for certain reasons [29]. The sample taken was students ranked in the top 15 in the Grade VII Science classes from 3 public high schools and 3 private high schools, namely SMAN 1 Gowa, SMAN 19 Gowa, SMAN 22 Gowa, SMA Muhammadiyah Limbung, SMA Handayani, and SMA Bajeng Aksara.

The technique used to collect data in this research is a questionnaire which has been effective based on the facts [30, 31]. This instrument was distributed online to 90 respondents via the link https://education-survey.000webhostapp.com after going through the validation stage using Aiken validity. This instrument included statements that measure how interested students are in the Department of Physics Education in college.

The data analysis technique used in this research is descriptive analysis which aims to describe how interested the students are in physics department in college. The quantitative data obtained from the 5-scale answers were analyzed using a Likert scale (Jusuf et al. 2020). The formulas used in this analysis are:

Percentage (%) = (number of answers/maximum number) x 100%, (1)

The results of the data analysis are categorized into 5 categories adapted from Taufik, et al, (Taufiq, Siantoro, and Khamidi 2021) as follows.

Table 1: Categories of Students' Interests.

Score (%)	Category
80 – 100	Very High
60 – 79	High
40 – 59	Medium
20 – 39	Low
0 – 19	Very Low

3. Results and Discussion

This study provides an overview of the interest profile of high school students in Gowa Regency towards the Department of Physics Education. The data taken from 90 respondents from 6 high schools in Gowa Regency. The results of data analysis can be seen in the following table.

The table above reveals that none of the respondents was in the ”very high” category. This indicates that students in these 6 schools do not have a very high interest in the Department of Physics Education. Moreover, there are only 3 students, all from public schools, who have “high” interest in Physics Education Department, whereas no student from private schools is highly interested in physics education department.

Table 2: Overview of Students' Interests in Physics Education Department.

Name of School	Frequency of Each Category					Total number
	Very High	High	Medium	Low	Very Low	
SMAN 1 Gowa	0	2	4	7	2	**15**
SMAN 19 Gowa	0	0	3	9	3	**15**
SMAN 22 Gowa	0	1	0	12	2	**15**
SMA Muh. Limbung	0	0	7	2	6	**15**
SMA Handayani	0	0	0	10	5	**15**
SMA Aksara Bajeng	0	0	0	12	3	**15**
Total	**0**	**3**	**14**	**52**	**21**	**90**

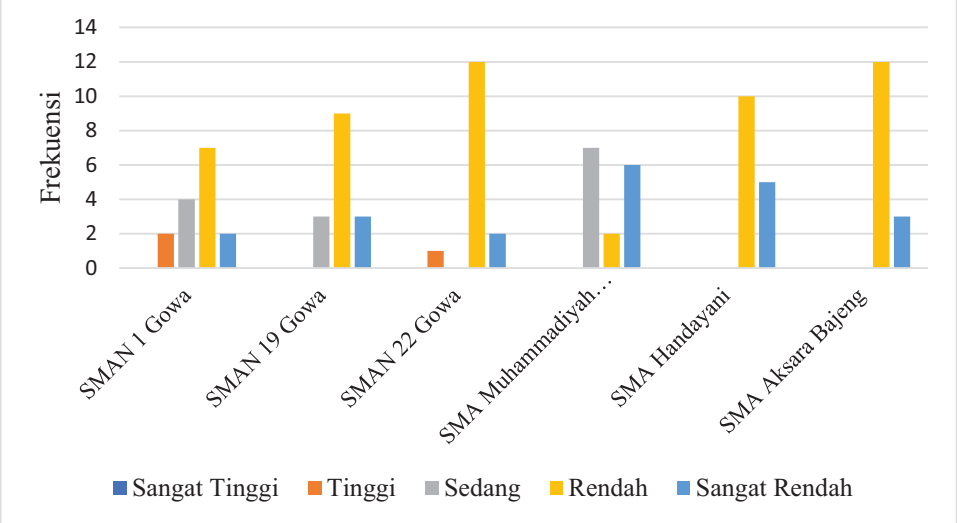

Figure 1: Graph of the Interest Level of Class XII Students towards the Department of Physics Education for Each School.

Ironically, more than a half of the respondents are in the category of "low" and "very low" interest in physics education department. This is in line with data from the Ministry of Education and Culture which shows the comparison of the capacity and number of prospective student applicants in the Department of Physics Education which has decreased significantly over the last 3 years [8]. The data from the analysis of students' interest in the Physics Education department can also be seen in the following graph.

The graph illustrates the interest of class XII students in several high schools in Gowa Regency is. The highest frequency is 12 students who are in the Low category for SMAN 22 Gowa and SMA Aksara Bajeng. While the lowest frequency is 1 student who is in the high category for SMAN 22 Gowa. From these data, the low category has the highest frequency for all schools. Therefore, it can be concluded that the interest of students

towards the Department of Physics Education is still low. Overall, the percentage of high school students' interest in Gowa Regency can be seen in the following diagram.

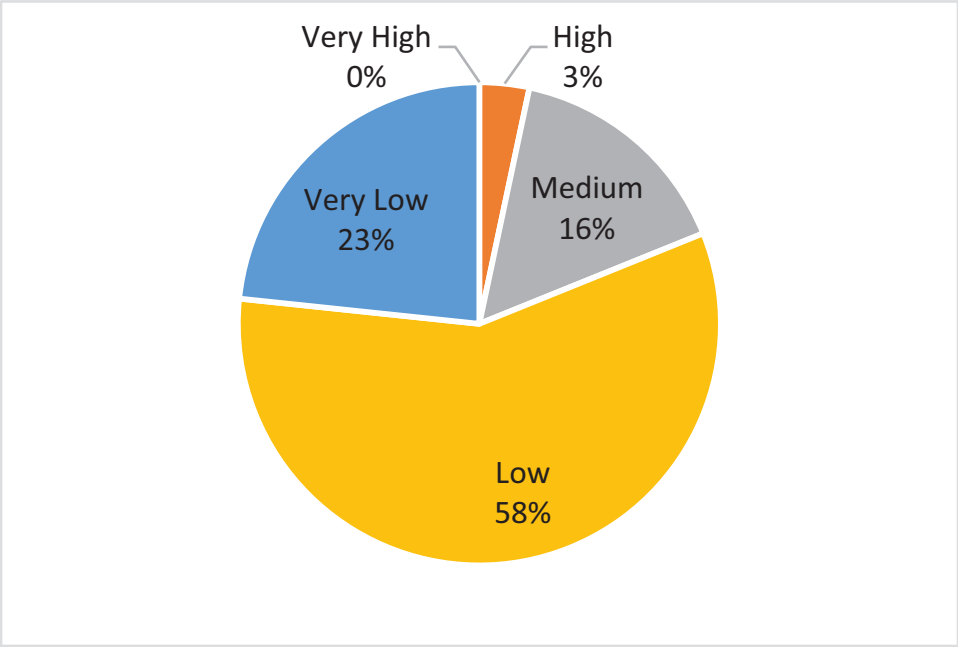

Figure 2: Graph of the Percentage of Interest of Class XII High School Students in Gowa Regency towards the Department of Physics Education.

The circle graph shows that the highest percentage of interest of students in Gowa Regency is in the low category, which is 58%. The second and third highest percentages are Low category and Medium category which is 23% and 16%, respectively. In addition, only very little percentage of students (3%) who are highly interested in physics department, and zero percentage of students in the very high category. Overall, it can be concluded that high school students in Gowa Regency have low interest in the Department of Physics Education.

The research conducted aims to describe the profile of interest of class XII high school students in Gowa Regency towards the Department of Physics Education. The results showed that most of the students have low interest in Physics Education Department. The low interest of students in the Department of Physics Education can be influenced by several factors such as lack of encouragement from parents, lack of motivation from Physics teachers at school, difficult physics materials, and the decreased working opportunities as physics teachers [32]. This research is strengthened by the results of Sunday and Chinedu's research which shows a decrease in students' interest in science education [33], especially in the field of Physics which is influenced by social factors, abilities, and students' efficacy (Ito and McPherson 2018). In addition, positive attitudes, abilities [34], self-confidence, and motivation [35] also directly affect students' interest

in the Department. Therefore, it is necessary to take the right approach to students to build their interest in the major because a positive interest in what is chosen is a measure of one's success [22, 23].

4. Conclusion

Based on the results of analysis, it was found that the interest of high school students in Gowa Regency towards the Department of Physics Education is in the "low" category. This is what triggers the declining number of applicants in the Department of Physics Education. Therefore, it is hoped that further research will be able to find the right solution to overcome the problem of decreasing students' interest in choosing the department.

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4.1. Future Research

This research still has some shortcomings, so the researcher offers some suggestions for future research, including:

1. The drawback of this study is that the number of schools taken is less representative for the existing population. Therefore, for further research, it is better to take a school sample of at least 50% of the total number of schools in the district.

2. This study only examines the interest of high school students in physics education department. It has not elaborated the interests of students who have enrolled in the Department of Physics Education. Thus, it is recommended for further researchers to examine whether the physics education students' interest have been relevant with the major they have chosen.

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