The Attitudes of First-Year Graduate Students Towards Research: A Cross-Sectional Study

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Abstract. Graduate students must have research skills, so some universities conduct research-based learning. However, students' attitudes toward research have never been measured. The purpose of this study was to explore graduate students' attitudes toward research. This study used a cross-sectional survey design. Attitudes toward research can have an impact on self-confidence, learning motivation, and academic achievement. Graduate students from the Biology Department took part in an online survey about their attitudes toward research using Google Forms. The sample consisted of 83 graduate students from various universities in Indonesia. An attitude toward the research questionnaire was used, with six categories: research usefulness for the profession, research anxiety, positive attitude toward research, the relevance of research to life, research difficulties, and research complexity. Data analysis was performed using descriptive statistics where frequency and percentage were calculated for categorical variables. The study results show that most students like research (81.93%) and think it will be beneficial to their lives and careers (93.98%), but they also believe that research is complex (75.9%) and has some flaws (59.04%). The implication of this research is to make students aware of the usefulness of research and the challenges they face when conducting research. The curriculum for research methodology courses needs to be improved to shift the perception of the difficulty and complexity of research.

1 Introduction

The era of development of science and technology needs individuals with the ability to solve problems, analyze, and carry out activities productively, constructively, and creatively as scientists work [1]. Many countries reported in the research of Ravitz et al. [2] have revised their science learning curricula to equip individuals with 21st-century skills, including communication, cooperation, critical thinking, and creative thinking. The most appropriate way to achieve these competencies is to involve individuals in research activities [3]. The reason is that the stages of conducting research accommodate students to become accustomed to applying various demands of 21st-century competencies. Based on these circumstances, it is crucial for formal educational institutions, especially in Indonesia, to orient research in learning, particularly for tertiary education. The government's demands through the Minister of Education and Culture Regulation concerning National Higher Education Standards (2020) say that every tertiary graduate must be able to conduct research.

Research relies heavily on research because the final product of this level of education is research reports [5]. As a result, students must be equipped with skills, knowledge, and other competencies in order to conduct research independently. To accommodate this, several Indonesian universities have implemented research-based learning to improve the quality of research in the country [6] as well as biology major [7,8]. However, the outcomes were not optimal. The result can be seen in the ranking of publications in Indonesia based on Scimago Journal and Country Rank measurement results [9], which is ranked 40th out of 242 countries worldwide. Besides the problem of the number of publications in Indonesia, which is still low, the trend of publications is also fluctuating. This also occurs in the trend of publications in biology education topic. The present study shows that there has been a reduction in the number of publications over the past four years in biology education topics [10]. The affective domain also influences the implementation of the research in the form of attitudes toward research.

Attitudes towards research are thoughts, feelings, and habits carried out in research divided into positive and negative attitudes [11]. Several countries have analyzed attitudes towards research on students, such as Pakistan [12,13], Cyprus [14], India [15], United States [16], and the Philippines [17]. Attitudes affect behavioral intentions, which ultimately affect the formation of an action [3]. Individuals with a positive attitude about something, including research, will show more responsible behavior toward a problem than those

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with a negative attitude [1]. Thus, attitudes toward research in higher education are essential to study because they ultimately affect the entire research process.

Various studies in various countries have been conducted to determine attitudes towards research. This study focused on measuring the attitudes of graduate biology students in Indonesia toward conducting research. The study is based on the premise that research should be the primary focus of graduate students' studies, as it relates to the preparation of the final project in the form of a thesis or dissertation. The purpose of this study is to determine research attitudes among first-year graduate students in Indonesia. The findings will aid in developing curriculum designs at the University.

2 Subject and method

This study is a quantitative survey study with a cross-sectional design to explore graduate students' attitudes towards research. The cross-sectional survey design is used to study a population sample at one time [18]. The population of this study was first-year graduate students majoring in biology in Indonesia, with a sample of 83 graduate students.

Data collection was carried out online using a questionnaire distributed via Google Forms. Check & Schutt [19] emphasized that internet-based questionnaires were chosen because they are relatively cheap and practical for reaching samples in large populations. The research instrument was adapted from Papanastasiou and Schumacker's research attitude scale [20]. The instruments used are a questionnaire with a Likert scale from strongly disagree to strongly agree with a total of 30 statements with 15 statements for each positive and negative statements. The questionnaire instrument consists of six categories of attitudes, namely: (1) the use of research for the profession; (2) research anxiety; (3) positive attitude towards research; (4) relevance to life (5) research difficulty, and (6) research complexity. Data were analyzed using descriptive statistics. Frequencies and percentages are calculated for each variable category and presented in graphical form.

3 Results and discussion

In this study, the results are a combination of data from five universities, with the assumption that all respondents had the same study experience. Descriptive statistical calculations were performed for each variable category consisting of 6 categories, namely the use of research for the profession (category 1), research anxiety (category 2), positive attitude towards research (category 3), relevance to life (category 4), research difficulty (category 5), and research complexity (category 6). The research results are summarized in the graph below in Figure 1.

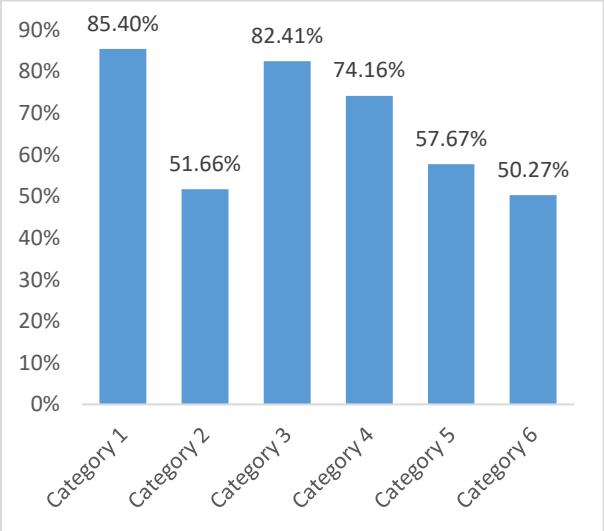

Fig. 1. Graph of Graduate Student Attitude Towards Research Score Results

According to the Figure 1, graduate students respond well to using research for the professional purposes, have a positive attitude towards research, and believe that research is relevant to their lives. These findings indicate that graduate students have a research interest and recognize the value of research in their profession and lives. In contrast, graduate students provided inadequate responses in the categories of research anxiety, difficulty, and complexity. Graduate students face anxiety and difficulties in practice, they believe research is complicated and difficult.

Generally, graduate students enjoy research and feel that it benefits them. Research experiences shape students' attitudes toward research [16]. Students with research experience will be able to improve attitudes in a variety of areas, including learning motivation, interest in science, interest in research, interest in obtaining an education and thinking about new things [21]. Because of their interest in research, many students continue their education [22].

On the other hand, graduate students perceive research as a complex activity and frequently encounters difficulties in implementation. The result is in line with Roxas' research [17] which shows a positive attitude towards research on students with high anxiety levels. Some obstacles experienced in conducting research include a lack of time and experience [23]. Meanwhile, gender and academic abilities have no effect on student research attitudes [24,25].

Student attitudes toward research are unrelated to academic performance [17], but they can have an impact on their work performance. Students who lack knowledge about the importance of conducting research when they enter the workforce will tend to have a negative attitude towards research [26]. Belief in the usefulness of research can reduce research anxiety and increase research interest [27]. So, it is critical to introduce research to students. Training and student involvement in research can improve student attitudes towards research [28]. Several other factors cause workers to be reluctant to conduct research, include administration, time, access, perception,

communication, resources, skills, minimal rewards, and doubts about the relevance of research to the profession [26,29,30].

In comparing results with undergraduate students, Issah & Braimah's [1] research results regarding attitudes towards research show that, in general, undergraduate students have a negative attitude in the form of anxiety towards research. Furthermore, Pallamparthy & Basavareddy's [31] study, which compared attitudes towards student research between generations, showed that students' negative attitudes were directly proportional to the increase in the school year. The increase means that students in the lower-year class have a more positive attitude towards research compared to the upper-year class students. The reason is that upper-class students have less time in academic terms due to various activities and organizational involvement, which causes the attitude towards research.

The similar finding was also reported by Siamian et al. [32] that junior students' attitudes toward research are better than seniors. Furthermore, research related to research attitudes of undergraduate and graduate students has also been conducted in Iran by Osman [33], which shows that there is a decrease in student attitudes as the school year increases, the time of graduation is near, and demands for marriage. The reduced student attitude is due to the increased study load, workload, and marital responsibilities. The research results show that most students express involvement in research because of interest, followed by obligations during exams and peer pressure in groups [33].

3.1 Research usefulness for the profession

Data consists of six categories. The first category is research usefulness for the profession, with 85.40% of graduate students agreeing. Graduate students say that research benefits their careers (93.98%), 98.8% say research is related to the student's field of study, and 92.77% of graduate students say they will use a research approach in their profession.

Research is considered to play a role in professionalism. However, in practice, workers experience several obstacles in conducting research, such as lack of time, low experience, and lack of understanding of the importance of research in their profession. Students face similar challenges when conducting research [34]. So, publishing research findings is required to broaden the role of research [35]. Workers also need research training programs to introduce research [36]. Cooperation among institutions and research culture needs to be improved to optimize research's role in the profession [37].

3.2 research anxiety

The second category is research anxiety, with 51.66% graduate students agreeing, which manifests as stress and discomfort when graduate students conduct research. The majority of graduate students disagreed that research was stressful (85.54%) and terrifying (69.88%), but 34.94% said that research was complicated. All research activities require preliminary analysis to identify research problems, a literature review, data collection, and analysis. The lengthy stages of research give students the impression that research is a difficult task. Students who study research methods need help related to affective issues, negative-naive conceptions, and the cognitive complexity of research [38]. Studying research examples can help students understand the complexities of research [39]. Research assistance, peer support, and team collaboration can help reduce student research anxiety, thus increasing students' attitudes towards research [38].

3.3 Positive attitude towards research

The third category is a positive attitude towards research (82.41%) which shows that 81.93% of graduate students like research, 91.57% said that the research was interesting, and 85.18% agree that most students benefit from research. Students are already familiar with research [40] and have a positive attitude towards research activities [31]. There was no significant change in attitudes towards research among students at different levels, as well as for graduate students [40,41]. A positive attitude towards research can affect students' interest in research.

3.4 The relevance of research to life

The fourth category is the relevance of research to life, with 74.16% graduate students agreeing. 75.90% of graduate students say that research plays an essential role in their life; 53.01% had neutral responses about using research in their daily lives, but 66.27% did not agree that research was irrelevant to their lives. Students are aware of the relevance of research in their lives. The mindset of researchers makes students more selective in receiving information and solving problems in life [42]. Students' attitudes toward research also affect self-confidence, learning motivation, and learning achievement [43].

3.5 Research difficulties

The fifth category is research difficulty (57.67%) which shows that 42.17% of graduate students have difficulty with data analysis, 4 9.4% of students do not find it difficult to understand the concept, and 59.04% of students have neutral responses about the experience of making mistakes in research. Students have a good understanding of research but require more motivation to conduct research [34,44]. Some research requires statistical analysis to reach conclusions [35,45] which makes students reluctant to do research. Errors in the use of statistics in research can also have an impact on wrong and misleading results [46]. Data analysis training using statistics can be an alternative to increase student interest in conducting research.

3.6 Research complexity

The last category is research complexity, with 50.27% graduate students agreeing; 75.9% of graduate students say that research is a complex subject; 90.36% say research requires complex thinking, but 73.49% of students like to study research details. Students need critical thinking skills to support concluding the research they are doing. Students can outline findings based on evidence through critical thinking [47]. Critical thinking is an important part of scientific thinking [48] and is related to research [49]. Practicing students' critical thinking skills can help improve attitudes toward student research in the research complexity category.

4 Conclusion

Most students view research positively and believe it will be beneficial in their lives and careers. At the same time, they believe that research is complex and has several implementation issues. To familiarize students and reduce the complexity and findings of problem in conducting research, it is necessary to develop a curriculum related to the introduction of research from an early level.

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