



Pre-Service Secondary Mathematics and Physics Teachers' Perceptions on Educational Research

Kimura Patar Tamba^{1,*} & Henni Sitompul²

¹Department of Mathematics Education, Universitas Pelita Harapan, Indonesia

²Department of Physics Education, Universitas Pelita Harapan, Indonesia

Abstract: Educational research is very important in improving the quality of learning practices. The purpose of this research is to describe and analyze pre-service teachers' perspectives on educational research. This research is a quantitative research using survey method in collecting data. Data was collected from 39 pre-service secondary teachers, consisting of majors in mathematics education and physics education. The data collection instrument used was a questionnaire. Data analysis consisted of descriptive statistics and Pearson moment-product correlation test. The results showed that pre-service teachers' perspectives on the value of educational research were in the high category. In addition, the results of the study show that there is a significant positive correlation between the value of pre-service teachers' educational research aspects and the teacher's own involvement in research.

Keywords: educational research, perspective on research, pre-service teacher.

Abstrak: *Educational research sangat penting dalam meningkatkan kualitas praktek pembelajaran. Tujuan penelitian ini adalah untuk mendeskripsikan dan menganalisis pre-service teachers' perspectives on educational research. Penelitian ini merupakan penelitian kuantitatif dengan menggunakan metode survei dalam mengumpulkan data. Data dikumpulkan dari 39 calon guru sekolah menengah, yang terdiri dari jurusan pendidikan matematika dan jurusan pendidikan fisika. Instrumen pengumpulan data yang digunakan adalah kuisioner. Analisis data terdiri dari statistik deskriptif, dan uji korelasi Pearson moment-product. Hasil penelitian menunjukkan perspektif calon guru mengenai value of educational research berada pada kategori tinggi. Selain itu, hasil penelitian menunjukkan terdapat korelasi positif yang signifikan antar aspek "value of educational research calon guru" dan "teacher's own involvement in research".*

Kata kunci: *penelitian pendidikan, perspektif atas penelitian, calon guru.*

▪ INTRODUCTION

Educational research is important in developing learning practices in the classroom. Teachers will gain deeper knowledge about learning effectiveness, new ideas, and student conditions from educational research. Educational research is a source of evidence to guide and direct teachers to make decisions on learning practices in the classroom (Farley-Ripple, May, Karpyn, & Tilley, 2018; Joram, Gabriele, & Walton, 2020). The use of evidence-based or research-driven pedagogy is believed to not only improve teacher knowledge and skills but also student learning outcomes (Cain & Allan, 2017; Kaur, Busthami Nur, Purnomo, Mohd Yusof, & Suswandari, 2020). Chris Brown in his book "Evidence-informed policy and practice in education: a sociological" suggests that educational research is useful in two ways, namely usability and signifying value. (Kaur et al., 2020; Traianou, 2016). Usability means that educational research is useful in solving problems regarding learning. Signifying value

means that the results of educational research have a superior quality compared to other sources of information on educational issues. Educational research also helps teachers to understand the uniqueness of each student which is used to design appropriate learning (Awang-hashim, Kaur, & Valdez, 2019; Kaur et al., 2020).

Research shows that research can influence the content and thinking processes, attitudes and perceptions of teachers and make more intelligent educational decisions (Cain & Allan, 2017). In addition, educational research also influences policies and practices in "instrumental", "conceptual" or "strategic" ways (Cain & Allan, 2017; Cain, Brindley, Brown, & Jones, 2019; Cain, Wieser, & Livingston, 2016; Cain & Cain, 2017; Cain, 2015). Instrumental means that the results of educational research can be utilized in solving practical problems in the classroom. Conceptual means that educational research generates concepts and theories that influence policy and practice indirectly. Strategic means research findings are used by policy makers to justify decisions and give them credence that they otherwise might not have, 'to suit the short-term interests of policy makers (Cain, 2015).

However, in the school context, learning practices are very often not in line with the results of educational research (Awang-hashim et al., 2019; Kaur et al., 2020; Purnomo, Pramudiani, et al., 2020). This shows that there is a gap between the results of educational research and the learning practices carried out by teachers (Purnomo, Pramudiani, et al., 2020). Dagenais et al. (2012) shows that the findings from various studies reveal that teachers and education practitioners use very little educational research findings in designing and implementing learning practices. Research of Cain & Cain (2017) also shows the same thing that various studies reveal the low use of educational research in learning practices.

One of the factors that influence the low use of educational research results in learning practices is teachers' beliefs, perspectives, values and attitudes towards research (Beycioglu, Ozer, & Ugurlu, 2010; Drill, Miller, & Behrstock-Sherratt, 2013; Guilfoyle, McCormack, & Erduran, 2020; Ismail, Busthami Nur, Raman, & Purnomo, 2019; Leat, Lofthouse, & Reid, 2014; Peiser, Pratt, & Putwain, 2022; Purnomo, Pramudiani, et al., 2020; Purnomo, Prananto, et al., 2020). Teachers who hold the belief that the results of educational research are important will try to use them in learning practices in the classroom (Purnomo, Pramudiani, et al., 2020). Therefore research on the perspective of educational research is important to do.

Various studies have shown that between perspectives, views and attitudes regarding educational research, a clear line can be drawn (Beycioglu et al., 2010; Drill et al., 2013; Guilfoyle et al., 2020; Ismail et al., 2019; Leat et al., 2014; Peiser et al., 2022; Purnomo, Pramudiani, et al., 2020; Purnomo, Prananto, et al., 2020). This is because belief itself involves these two components, both the affective domain and the cognitive domain (Purnomo, Suryadi, & Darwis, 2016; Purnomo, Pramudiani, et al., 2020). In this study, the perspective on educational research is seen in terms of the two affective and cognitive components which are inseparable, influence each other and overlap. Therefore, the perspective regarding educational research in this study can be seen as a view, attitude or conception. This study uses the perspective concept developed by Everton et al. (2010). The perspective on educational research can be divided into two aspects (Everton, Galton, & Pell, 2002; Everton et al., 2010). The first

aspect is concerned with the value of educational research for classroom practice. The second aspect is concerned with the teacher’s own involvement in research.

Much research has been done on perspectives or beliefs on educational research. For example research of Everton et al. (2010) towards the teacher shows the teacher’s belief in the value of educational research when they are involved in research. Another research conducted by Purnomo, Pramudiani, et al. (2020) towards teachers in Indonesia shows that teachers tend to have negative beliefs about educational research. Research on pre-service teachers has also been carried out by Guilfoyle et al. (2020) which shows that certain beliefs become a barrier to evaluating educational research as valuable. However, the various studies above have not analyzed the perspective of pre-service teachers on educational research in the Indonesian context. Therefore, the purpose of this research is to analyze and describe the perspective of pre-service teachers on educational research.

▪ **METHOD**

Participants

This research was conducted at Pelita Harapan University in 2022. This research involved 39 pre-service secondary teachers (15 male, 24 female). The selection of participants was carried out purposively, namely pre-service secondary teachers who were being enrolled in research methodology courses.

Research Design and Procedures

This study uses quantitative research. Data collection was carried out using survey methods. The survey method was chosen because it is in line with the research objective, which is to describe pre-service teachers’ perceptions of educational research (Cohen, Manion, & Morrison, 2018). The research procedures were (1) determining the validity and reliability of the questionnaire adopted from Everton (2002), (2) collecting data through a questionnaire, (3) analyzing data from the questionnaire, and (4) describing the perceptions of pre-service teachers’ perspective of educational research.

Instrument

The research instrument used in the study was a questionnaire. The questionnaire used is an instrument developed by Everton et al. (2002) by translating it into Indonesian. This questionnaire consists of two aspects. The first aspect is concerned with the value of educational research for classroom practice. The second aspect is concerned with the teacher’s own involvement in research. The first aspect contains 11 statement items, and the second aspect contains 7 statement items. Complete items from the questionnaire can be s’ en at Table 1 (Everton et al., 2002). This questionnaire uses a Likert scale with a 5-point scale, namely 5 (essential), 4 (important), 3 (helpful), 2 (not important) and 1 (of no value).

Table 1. Educational research questionnaire (Everton et al, 2002)

Aspect	Statement
A. Value of educational research for classroom practice	The evidence of research is of value to teachers if: A1. it demonstrates effective teaching and learning A2. it focuses on classroom actions A3. it focuses on the detail of teacher-pupil interaction

	<p>A4. it tackles specific aspects of teaching and learning (questioning/feedback/assessment/presentation/interpretation/pupil answers)</p> <p>A5. it focuses on teacher subject knowledge</p> <p>A6. it focuses on teacher beliefs</p> <p>A7. it provides clear examples of teachers and pupils at work in Classrooms</p> <p>A8. makes clear that teachers will need to interpret findings in the context of their own situation</p> <p>A9. it is subject specific</p> <p>A10. it is capable of being generalized</p> <p>A11. it provides evidence of learning gain</p>
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B. Teacher's own involvement in research	<p>The evidence of research is of value to teachers if</p> <p>B1. it shows teachers how to assess themselves effectively</p> <p>B2. teachers, themselves, helped identify the research questions</p> <p>B3. teachers, themselves, have adequate research skills</p> <p>B4. teachers, themselves, helped design the research project</p> <p>B5. teachers, themselves, helped interpret the research data</p> <p>B6. teachers, themselves, helped interpret the findings</p> <p>B7. teachers, themselves, helped prepare the research summaries</p>
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The questionnaire has been tested for validation. The results of the validation test showed that 16 questionnaire items were valid with Pearson moment-product correlation values ranging from 0.318 to 0.75, significantly for $\alpha=0.05$. While two invalid statement items (item 6 and item 8) were removed from the questionnaire. Validation test was also carried out based on both aspects. In the first aspect, all statement items have acceptable validation, namely the Pearson moment-product correlation value in the range 0.342 to 0.717, which is significant for $\alpha = 0.05$. The results of the validation test in the second aspect also show that all items have acceptable validation with a value the Pearson moment-product correlation in the range of 0.362 to 0.805 is significant for $\alpha = 0.05$.

The results of the reliability test were carried out with the Cronbach's Alpha test. The Cronbach's Alpha value in total, the first aspect and the second aspect are 0.814; 0.783 and 0.745 (greater than 0.5) indicate that the statement items in the questionnaire have high internal consistency. This questionnaire was distributed using Microsoft Forms with an average filling time of 6 minutes 6 seconds.

Data Analysis

Data analysis using descriptive and inferential statistics. Descriptive statistics are used to provide a descriptive picture of the perspective of pre-service teachers regarding educational research. The mean and standard deviation values in total and based on both aspects will be calculated. The mean value is then categorized using hypothetical statistical techniques (Sugiyono, 2012) (Table 2). Inferential statistics will use Pearson product-moment correlation analysis to see the relationship between aspects and between reading papers and scores. Analysis was performed using SPSS 20.0 software.

Table 2. Perception level of value of educational research

Interval Score	Criteria
$X > 2.67$	High
$1.33 < X \leq 2.67$	Medium
$X \leq 1.33$	Low

▪ **RESULT AND DISSCUSSION**

The research results will be presented in two major parts. The first part will present a description of the perceived value of educational research for pre-service teachers. The second part will describe the relationship between aspects of the value of educational research. Table 3 shows the results of the descriptive analysis of the value of educational research from pre-service teachers. The mean value means the level of value of educational research according to the pre-service teachers' perspective. The greater the mean value, the higher the pre-service teachers' perspective regarding the value of educational research. The mean value of the first aspect is 3.98 and is in the high category. This result means that pre-service teachers have a high perspective on the value of educational research in terms of classroom practice. This means that pre-service teachers see educational research as having value if it has direct implications for classroom practice. The direct implications of practice referred to in this case are "if the research results demonstrate effective teaching and learning", "research results focus on classroom actions", and so on. These results indicate that for pre-service teachers the value of educational research is largely determined by its implications for classroom practice.

Table 3. Descriptive statistics of value of educational research

	Mean	Std. Dev	Min	Max	Category
First Aspect					
Statement 1 (A1)	4.10	0.75	3.00	5.00	High
Statement 2 (A2)	3.90	0.72	3.00	5.00	High
Statement 3 (A3)	4.15	0.78	3.00	5.00	High
Statement 4 (A4)	4.18	0.64	3.00	5.00	High
Statement 5 (A5)	3.95	0.76	3.00	5.00	High
Statement 7 (A7)	3.72	0.61	3.00	5.00	High
Statement 9 (A9)	3.72	0.69	3.00	5.00	High
Statement 10 (A10)	4.03	0.96	1.00	5.00	High
Statement 11 (A11)	4.15	0.75	3.00	5.00	High
Total First Aspect	3.98	0.45	3.11	5.00	High
Second aspect					
Statement 1 (B1)	4.21	0.66	3.00	5.00	High
Statement 2 (B2)	3.44	0.79	3.00	5.00	High
Statement 3 (B3)	3.97	0.74	3.00	5.00	High
Statement 4 (B3)	4.05	0.72	3.00	5.00	High
Statement 5 (B5)	4.10	0.64	3.00	5.00	High
Statement 6 (B6)	4.23	0.67	3.00	5.00	High
Statement 7 (B7)	4.15	0.67	3.00	5.00	High
Total Second Aspect	4.02	0.44	3.27	5.00	High
Total	4.01	0.37	3.31	4.88	High

The mean value of the second aspect is 4.02 and is in the high category. This result means that pre-service teachers have a high perspective on "the teacher's own involvement in research". This means that pre-service teachers see educational research as having value if it helps teachers to engage in and with research. Helping teachers to engage in and with research, this is like "if the research results show teachers how to assess themselves effectively", "teachers, themselves, have adequate research skills", "teachers, themselves, helped identify the research questions" and so on. These results indicate that for pre-service teachers the value of educational research is largely determined by teacher involvement in research. The total mean value of pre-service teachers' perspective regarding the value of educational research is 4.01 and is in the high category. The results mean that according to pre-service teachers educational research has value if it helps teachers to engage in and with research and has implications for classroom practice.

The results of the correlation analysis between aspects, aspects with a total are shown in Table 4. The values shown in Table 4 are the results of calculating the Pearson product-moment correlation value. Pearson product-moment correlation value between the first aspect and the second aspect is significant at 0.05. This value means that there is a significant positive relationship between "the value of educational research for classroom practice" and "the teacher's own involvement in research". In other words, pre-service teachers who have a high perception of "the value of educational research for classroom practice" also have a high perspective of "the teacher's own involvement in research". The Pearson product-moment correlation value between the first aspect and the total is positive and significant at 0.05. This means that the value of educational research pre-service teachers is positively related to the implications of classroom practice from research. Meanwhile, the Pearson product-moment correlation value between the second aspect with a total value is positive and significant at 0.05. This means that there is a close and positive relationship between the value of pre-service teachers' educational research and the pre-service teacher's own involvement in research.

Table 4. Bivariate correlation analysis

	First Aspect	Second Aspect	Total
First Aspect	1	-	-
Second aspect	0.38*	1	-
Total	0.88*	0.78*	1

*p < .05

There are two main findings from this study based on the results of the data analysis above. First, the pre-service teachers' perspective regarding the value of educational research is in the high category. Both from the value for classroom practice aspect, the teacher's own involvement in research aspect and in total, the pre-service teachers' perspective regarding the value of educational research is in the high category. These results are different from research of Guilfoyle et al. (2020) which shows that pre-service teachers have a negative perspective on educational research. The results of this study are also different from the results of research in the context of teachers conducted by Purnomo et al. (2020). Purnomo et al. (2020) shows that most of

participants tend to hold negative beliefs, especially a concern for the use of research. On the contrary, the results of this study are in line with research from Everton et al. (2002) and Beycioglu et al., (2010) which shows the participants (teachers) have a positive perspective on the value of educational research.

Differences in results can occur because of space in facilitating research transfer (Beycioglu et al., 2010; Cain et al., 2016). Space in the research transfer facility can be in the form of reading the research report, reading academic journals, books and in-service training (Beycioglu et al., 2010; Cain et al., 2016; Everton et al., 2002, 2010). In this study, the participants (pre-service teachers) were involved in several of these activities such as reading academic journals, analysis research methodologies, and writing research proposals. Thus, there was a research transfer of pre-service teachers. re-service teachers also received a lot of information about educational research. This is called by Cain et al. (2017) as knowledge mobilization. Knowledge mobilization means the process by which knowledge is transferred from its originating community – often a research community – to other communities. This factor is believed to be a factor that makes pre-service teachers have a positive perspective on the value of educational research.

The same thing was also revealed by research of Purnomo, Pramudiani, et al. (2020). Research of Purnomo, Pramudiani, et al. (2020) shows that participants who tend to hold negative beliefs about educational research believe that the difficulty of coordination between researchers and practitioners creates a lack of interest in educational research. The various previous studies, both showing positive and negative beliefs, saw the need for mediators to guide practitioners (teachers and pre-service teachers) in obtaining information about educational research and its benefits. In this research, lecturers are mediators who provide activities such as reading academic journals, analysis research methodologies, and writing research proposals in lectures. However, further research is needed to explore and clarify these findings.

The second finding in this study is that there is a close and positive relationship between the value of pre-service teachers' educational research and the teacher's own involvement in research. This result is in line with previous research which showed that the greater the involvement of practitioners (pre-service teachers or teachers) in research, the more positive the perspective on the value of educational research (Beycioglu et al., 2010; Everton et al., 2002, 2010).

Nevertheless, the results of this study must be seen within several limitations. First, the small number of participants makes the results of this study not strong enough to be generalized in a wider context. Second, the use of questionnaires only captures the perspectives or beliefs of pre-service teachers. Various previous studies have shown that it is possible for a teacher to hold inappropriate or inconsistent beliefs (Op't Eynde, De Corte, & Verschaffel, 2002; Tamba, Cendana, & Adegbite, 2021; Tamba, Cendana, & Pratiwi, 2020; Tamba, 2021; Xenofontos, 2018).

▪ CONCLUSION

Based on the results and discussion above, the conclusion of this study is that pre-service teachers have a negative perspective on educational research and there is a close and positive relationship between the value of educational research pre-service teachers and the pre-service teacher's own involvement in research. The results of this study

provide practical implications in two ways. First, the importance of evaluating and developing pre-service teachers' perspectives or beliefs regarding educational research. Second, activities such as reading academic journals, analysis research methodologies, and writing research proposals in lectures will help pre-service teachers have a positive perspective on educational research.

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