INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH AND ANALYSIS

ISSN(print): 2643-9840, ISSN(online): 2643-9875

Volume 07 Issue 07 July 2024

DOI: 10.47191/ijmra/v7-i07-69, Impact Factor: 8.22

Page No. 3593-3603

The Relationship between Pre-service Teacher's Motivation in Teaching, Readiness as a Professional Teacher, and Self-efficacy in ICT Development

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ABSTRACT: This correlational study aims to examine pre-service teacher's motivation in teaching, readiness as a professional teacher, and self-efficacy in ICT development. It examines the dimensions among pre-service teacher's motivation in teaching, readiness as a professional teacher, and self-efficacy in ICT development in the study as well as examined their relationship. It also examines whether there are significant differences in the dimensions of pre-service teacher's motivation in teaching, readiness as a professional teacher, and self-efficacy in ICT development differ according to gender and age. The participants of the study were 111 English pre-service teachers of two universities in Yogyakarta, Indonesia. The data were collected by distributing three different questionnaires, i.e. motivation adopted from Abraham Maslow Theory, readiness adopted from Concern-Based Adaption Model (CBAM), and self-efficacy in ICT development adopted from Arigusman (2013). Pearson Correlation and Multivariate Analysis of Variance (MANOVA) were performed to analyze the data. The findings demonstrated that there were five dimensions of motivation in teaching, namely physiological needs, safety needs, social needs, esteem needs, and self-actualization needs; while readiness as a professional teacher consisted of three dimensions, namely level of use, stages of concern, and innovation of configuration, and self-efficacy in ICT development consisted of two dimensions, namely abilities and strategy using ICT and factors extrinsic and intrinsic. Furthermore, this study involved pre-service teacher's motivation in teaching, readiness as a professional teacher, and self-efficacy in ICT development as research variables. The first finding showed there was relationship among dimension in each variable, the second finding revealed there were significant differences between each dimension of each variable ($p = < 0.05$). Also, pre-service teacher's motivation in teaching, readiness as a professional teacher, and self-efficacy in ICT development did not show the significant differences according to gender and age.

KEYWORDS: Pre-service teachers, Motivation in Teaching, Readiness as a Professional Teacher, Self-efficacy in ICT Development

I. INTRODUCTION

The research toward pre-service teacher become a trend issue among researcher nowadays. Pre-service teachers are individuals enrolled in a formal teacher preparation program at a college, university, or other educational institution. They are undergoing training and preparation to become licensed or certified teachers. However, pre-service teachers represent a crucial stage in their professional development, where they are actively engaged in learning about teaching practices.

Pre-service teachers' motivation in teaching has become an important issue nowadays. Motivation in pre-service teachers indicates satisfaction in their work and enhances self-esteem and self-actualization. In line with Zhumash., Zhumabaweva., and Nurgalieva (2021), the development of an individual, professional orientation, professional self-determination, self-efficacy, and self-realization has been the defining characteristics of the motivating aspect of creative ability in pre-service teachers. Besides, work motivation is a complex emotional factor that originates inside and outside a person's existence. Investigating pre-service teachers' motivation in teaching to pursue a teaching career is also necessary (Hartono et al., 2023). Additionally, it represents that the act of initiating, concentrating, motivating, and maintaining a person's behavior toward achieving desired goals is known as motivation. (Ye et al., 2022). Thus, planning, focusing, motivating, and maintaining action toward desired goals is called motivation.

Furthermore, it is undeniable that technology affects practically all aspects of today's life, and education technology is no exception. Information and communication technology (ICT) is developing quickly for educational purposes in the twentieth century (Akhmedov, 2022). It raises expectations and focuses on how it might be integrated into teaching English. Technology used for learning in the 20th century. It has several benefits for educators—teachers, students, administrators, and other education-related professionals. In essence, Information and Communication Technology (ICT) is developing at a remarkable pace. Teachers are the primary stakeholders in the implementation and integration of ICT in education; they are also experts in their fields in the material they teach (Peciuliauskiene et al., 2022). The ability of teachers to use technology tools is a requirement for the effective integration of ICT in the classroom. Moreover, the comfortable in the classroom is based on the teacher's self-efficacy when using ICT.

The development of digital technology has impacted several aspects of society, including the training of future teachers. Teachers must be proficient in using digital technologies throughout their pre-service and certification programs. The use of digital technology in early teacher education has improved tutoring, teaching, and other academic activities. Nowadays, it isn't easy to conduct teacher education activities without using digital technology (Ove E. Hatlevik, 2020). Therefore, this highlights the significance of determining instructors' self-efficacy in ICT development.

In practical terms, though, pre-service teachers encountered some challenges while attempting to include ICT. They struggle to successfully use the ICT knowledge and abilities they have acquired at university when they practice teaching in classrooms. They were discouraged from using ICT in the school because of the difficulty of the lesson plans and the realities of the teaching profession. Hicham Zyad (2016) the main obstacles to teachers integrating technology in the classroom include low-quality ICT facilities, a lack of collaborative learning and teacher cooperation, time restrictions, and a lack of incentives. Meanwhile, Batane & Ngwako (2017) found that in addition to the lack of ICT resources, pre-service teachers feel prevented from using ICT in the classroom because of the lack of technological instructors and the lack of expectations from mentors and supervisors.

Ertmer and Ottenbreit-Leftwich (2010), state two main reasons pre-service teachers must incorporate ICT into their lessons. First, extrinsic issues include limited technological access, poor training, time limits on learning new skills or preparing ICT-based materials, technical support, abilities and strategies, and a lack of supporting facilities. Intrinsic elements, often known as psychological states, comprise the second factor. However, a teacher's readiness significantly impacts their ability to integrate ICT tools and resources seamlessly into instructional practices, fostering a conducive learning environment enriched with technological advancements (Hakimi et al., 2024). These include beliefs about one's abilities, a lack of learning motivation, attitudes, behaviors, computer anxiety, and resistance.

In the literature on the education era, this problem of pre-service teachers' readiness, motivation, and self-efficacy in ICT development has been extensively used and investigated. It has been noticed that, in Indonesia, there has only been a little study on the relationship between pre-service teachers' motivation in teaching, readiness as a professional teacher, and self-efficacy in ICT development. This study investigates how a pre-service teacher's motivation in teaching, readiness as a professional teacher, and self-efficacy in ICT development are correlated. This is because it is now commonly known the motivation in teaching, readiness as a professional teacher, and self-efficacy in ICT development of pre-service teachers bring along when they participate in their teaching education programs give the big impacts. (Yüce et al., 2022).

Thus, the purpose of the current study is to investigate the relationship between pre-service teachers' motivation in teaching, readiness as a professional teacher, and self-efficacy in ICT development. This is an attempt to improve the data for the research on the relationship between self-efficacy, readiness, and motivation. The findings of this study are anticipated to add to the depth of knowledge on the three variables—pre-service teachers' motivation in teaching, readiness as a professional teacher, and self-efficacy in ICT development—since there aren't many studies that examine these relationships.

For instance, Hatlevik (2018), discovered in his study that teachers' usage of ICT in the classroom is correlated with collegial teamwork, which is driven by external motivation. According to one interpretation of those results, the ability to use ICT in education and the growth of self-efficacy in ICT development for educational purposes are dependent on having general selfefficacy in ICT development. Furthermore, there is a strong positive correlation between teachers' general self-efficacy in ICT growth and their self-efficacy for teaching purposes. Teachers' self-efficacy in ICT development for instructional purposes or their use of ICT in teaching is significantly correlated with the school management's lack of support for using ICT in the classroom. The general self-efficacy of teachers in ICT development, collegial collaboration, and lack of facilitation, on the other hand, have moderate relationship.

Similar to Farhath et al., (2023), this study effectively examined the relationship between teachers' motivation and selfefficacy. They discovered through their research that there is a substantial and favorable correlation between secondary school

teachers' self-efficacy and motivation. The results also show that teaching may be more successful if a highly motivated and effective teacher joins the group. Teachers must pay closer attention to their student's reading comprehension abilities.

Overall, the goal of this study is to determine how pre-service teachers currently enrolled at two Yogyakarta universities relate to one another in terms of their professional readiness, self-efficacy in ICT development, and teaching motivation. This study was conducted using a single significant English teacher, and its participants were drawn from several universities, setting it apart from the other research studies that were previously addressed. To examine each dimension, this study used Confirmatory Factor Analysis (CFA) combined with several analyses from previous studies.

The present study examines the relationship between pre-service teachers' motivation in teaching, readiness as professional teachers, and self-efficacy in ICT development. Motivation has five dimensions, readiness has three, and ICT selfefficacy has two. Furthermore, gender and age are also included as demographic variables.

II. MATERIAL AND METHODS

The approach used in this study is quantitative with Pearson correlation and (Multivariate Analysis of Variance) MANOVA analysis. Quantitative research is research that uses measuring instruments whose data is analysed with statistics. The population in this study is all the English pre-service teachers in two universities in Yogyakarta. The researchers classified the population based on the level of accreditation. However, the two universities above an A-accredited undergraduate English Education study program. However, in 2023, only two universities opened an English Education Department in the second wave of the PPG program. Therefore, the researchers chose those two universities to serve as a subject for this study. Based on this, the sampling technique that researchers used is a convenience sampling because it is a non-probabilistic sampling technique applicable to both qualitative and quantitative studies, although it is most frequently used in quantitative studies (Wu Suen et al., 2014). However, convenience sampling in quantitative methods refers to a non-probabilistic sampling technique where readily accessible subject are included in a study, leasing to unequal opportunity for participation and limited generalizability to the target population. In a correlational study using convenience sampling, "readily accessible" typically refers to subjects readily available and accessible to the researcher without extensive effort or resources.

This research consisted of two primary variables, namely independent and dependent variables. There are three variables in this research; two independent variables and one dependent variable. The independent variables in this study, namely preservice teachers' motivation in teaching and readiness as a professional teacher, while the dependent variable is self-efficacy in ICT development.

1) Questionnaire

To collect the data, the questionnaire used in the present study with a close-ended questionnaire style as the instrument. The questionnaire used in this study referred to the Likert scale modified with five alternative answers from a very positive to a very negative response. The development identified each variable's indicator and arrange the questionnaire outline based on the needle. Overall, the part uses a Likert four-point scale (1 = Strongly Disagree, 2 = Disagree, 3 = Strongly Agree, and 4 = Agree). The respondents may select from various categories on a Likert scale to show their thoughts, attitudes, or feelings regarding a specific topic. Most frequently, Likert-scale surveys employed to research factors that affect individuals differently, like motivation, anxiety, and self-assurance.

The questionnaire is a popular and effective tool for gathering survey data because it offers organized, frequently numerical data, may be delivered without the researcher present, and is consistently comparatively easy to analyse (Cohen et al., 2007).

There were three sections on the questionnaire. The first sections' data collection focused on the pre-service teachers' motivation in teaching, such as physiological needs, safety needs, social needs, esteem needs, and selfactualization needs. The second section collected the data of pre-service teachers' readiness, such as stage of concerns, level of use, and innovation configuration. For the last section collected the data of pre-service teachers' Self-efficacy in ICT development, such as abilities and strategies using technology and factors of external and internal using technology. The blueprint of this questionnaire as follows. The questionnaire's Likert scale was employed in this present study to get precise data on pre-service teachers' motivation in teaching, readiness, and self-efficacy in ICT development. According to Fraenkel (2012), using a Likert scale, participants can self-report by rating how much they agree or disagree with a set of propositions. The final score is thought to reflect the respondent's attitude or point of view, and each choice is assigned a number. A four-point response structure was employed in the Likert scale to greatly impact the questionnaire's outcomes. Many individuals choose this scale style, according to Asún et al., (2016), to avoid intermediary categories that may not be sufficient. Thus, the following grading system utilized in this study:

1) Strongly Disagree 2) Disagree 3) Agree 4) Strongly Agree.

The data analysis technique used in this study is Pearson correlation and (Multivariate Analysis of Variance) MANOVA. Prerequisite test is a test used before analyze further data in testing hypotheses. The results of this test determined whether the hypothesis test uses a parametric or nonparametric test. There are two types of prerequisites in this research, namely normality and homogeneity tests.

III. RESULTS AND DISCUSSION

This study aimed to get reliable data to address the research issues concerning the relationship between pre-service teachers' motivation in teaching in teaching, readiness, and self-efficacy in ICT development.

a. Normality Test

The normality test is carried out to determine whether or not the variable data is normally distributed before hypothesis testing (Usmadi, 2020). The Kolmogorov-Smirnov formula was used to perform the normalcy test through. The IBM SPSS (Statistical Product for Service) 25.0 application was used for the Kolmogorov-Smirnov test. If the significance value obtained > 0.05, the data is normally distributed; if the value received < 0.05, the data is not normally distributed. The data is normally distributed if the significance value found is more than 0.05; it is not normally distributed if it is less than 0.05.

b. Homogeneity Test

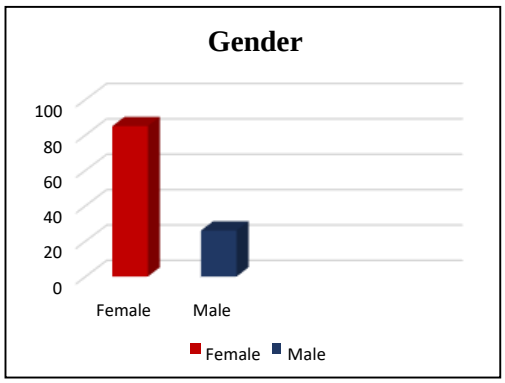
The homogeneity test is utilized when determining if the variances of two or more distributions are the same. Measuring the two variances is how the equality of two variances test determines the data distribution is homogeneous (Usmadi, 2020). The Levene test was used for the homogeneity test, and IBM SPSS (Statistical Product for Service) 25.0 was utilized to assist.

The foundation for decision-making is that a significance score of less than 0.05 indicates a difference in the variance between two or more data population groupings. If the significant value of the variance between two or more data population groups is more than 0.05, it is deemed to be the same.

Demographic Information

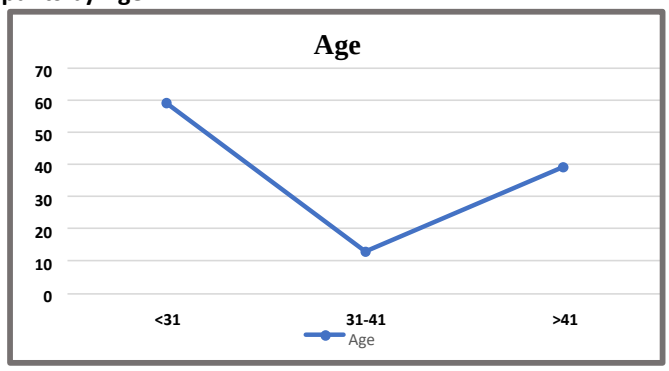
There are two background information collected in this study including gender and age. It is worth to note that the total participant of this study was 111 English pre-service teachers from two different universities in Daerah Istimewa Yogyakarta. It can be seen from Figure 3 that the female participants were four times more than the male participants. In other words, four out of five participants were female English pre-service teachers.

Table 1. The Distribution of Participants by Gender



It can be seen from Table 1. that the female participants were four times more than the male participants. In other words, four out of five participants were female English pre-service teachers.

Table 2. The Distribution of Participants by Age



The participants' age group ranged from < 31, 31-41, and >41 years old. This study revealed that private universities have a more varied student population. Thus, the age group is classified into three categories from < 31, 31-41, and >41 years old. Figure 5 showed that most participants were aged < 31 years old as they were in their junior or/and senior year at the university.

Pearson Correlation Test Result

In this study, data analysis was conducted to investigates the relationship among pre-service teachers' motivation in teaching and readiness as a professional teacher toward self-efficacy in ICT development.

To test the formulated hypotheses, several statistical analyses were run. The first subsection reports by Pearson Correlation, run through IBM SPSS 25.0, to investigate the relationship between the predictor variables (motivation in teaching and readiness as a professional teacher) and the criterion variable (self-efficacy in ICT development).

The Pearson Correlation analysis technique was used on the hypothesis among pre-service teachers' motivation in teaching and readiness as a professional teacher toward self-efficacy in ICT development. As the result based on *Table 15 on the Appendix*, there is a relationship among pre-service teachers' motivation in teaching and readiness as a professional teacher toward self-efficacy in ICT development.

Table 3. The Result of Pearson Correlation among Dimension in each Variable of Pre-service Teachers' Motivation in Teaching and Readiness as a Professional Teacher toward Self-efficacy in ICT Development

	Physiological Needs	Safety Needs	Social Needs	Esteem Needs	Selfactualization Needs	Stages of Concern	Level of Use	Innovation Configuration	Abilities and Strategy	Factors Intrinsic and Extrinsic
Physiological Needs	1	.483/.000	.447/.000	.443/.000	.449/.000	.327/.000	.331/.000	.325/.001	.288/.002	.404/.000
Safety Needs	.483/.000	1	.591/.000	.543/.000	.570/.000	.396/.000	.313/.001	.375/.000	.269/.004	.390/.000
Social Needs	.447/.000	.591/.000	1	.785/.000	.714/.000	.527/.000	.436/.000	.504/.000	.386/.000	.489/.000
Esteem Needs	.443/.000	.543/.000	.785/.000	1	.765/.000	.421/.000	.420/.000	.409/.000	.237/.012	.422/.000
Self-actualization Needs	.449/.000	.570/.000	.714/.000	.765/.000	1	.449/.000	.508/.000	.477/.000	.344/.000	.522/.000
Stages of Concern	.327/.000	.396/.000	.527/.000	.421/.000	.449/.000	1	.801/.000	.688/.000	.375/.000	.526/.000
Level of Use	.331/.000	.313/.000	.436/.000	.420/.000	.508/.000	.801/.000	1	.719/.000	.383/.000	.593/.000
Innovation Configuration	.325/.001	.375/.000	.504/.000	.409/.000	.477/.000	688/.000	.719/.000	1	.583/.000	.679/.000
Abilities and Strategy	.288/.002	.269/.004	.386/.000	.237/.012	.344/.000	.375/.000	.383/.000	.583/.000	1	.861/.000
Factors Intrinsic and Extrinsic	.404/.000	.390/.000	.489/.000	.422/.000	.522/.000	.526/.000	.593/.000	.679/.000	.861/.000	1

The Pearson Correlation analysis technique was used on the hypothesis among pre-service teachers' motivation in teaching and readiness as a professional teacher toward self-efficacy in ICT development. As the result based on *Table 3* above, there is a relationship among pre-service teachers' motivation in teaching and readiness as a professional teacher toward self-efficacy in ICT development.

Based on the output, the results can refer to this fundamental decision, there is related to Sig. (2-tailed) known Sig value. (2-tailed) among pre-service teachers' motivation in teaching and readiness as a professional teacher toward self-efficacy in ICT development with a value of < 0.05 there is a relationship among pre-service teachers' motivation in teaching and readiness as a professional teacher toward self-efficacy in ICT development.

Furthermore, as seen in the table, *R Squared* also revealed of the relationship among pre-service teachers' motivation in teaching and readiness as a professional teacher toward self-efficacy in ICT development, which (N-2 = 111-2= 109. If the N value is > 100, then round it up to 100, so the value is 0.19), the result shows that *R Square* > *R Table,* which 0.19, therefore, there is a relationship among pre-service teachers' motivation in teaching and readiness as a professional teacher toward selfefficacy in ICT development. Therefore, the first hypothesis was then rejected.

Table 4. The Result of Significant Differences of each Dimension of Pre-service Teachers' Motivation in Teaching and Readiness as a Professional Teacher toward Self-efficacy in ICT Development by Gender

This subsection presents the analysis result of Multivariate Analysis of Variance (MANOVA) to answer the second hypothesis, which was formulated as "*Is there any significant differences among dimension pre-service teachers' motivation in teaching and readiness as a professional teacher toward self-efficacy in ICT development by gender*."

		Gender
1	Physiological Needs	0,601
2	Safety Needs	0,922
3	Social Needs	0,203
4	Esteem Needs	0,304
5	Self-actualization Needs	0,665
6	Stages of Concern	0.147
7	Level of Use	0,192
8	Innovation Configuration	0,291
9	Abilities and Strategy	0,851
10	Factors Intrinsic and Extrinsic	0,295

Table 4 shows the multivariate tests of each dimension pre-service teachers' motivation in teachings' dimensions (i.e. physiological needs, safety needs, social needs, esteem needs, and self-actualization needs) and readiness as a professional teachers' dimensions (i.e. stages of concern, level of use, and innovation configuration) toward self-efficacy in ICT developments' dimensions (i.e. abilities and strategy using ICT and factors intrinsic and extrinsic using ICT) differed by gender (i.e. male and female).

From the result above, the *R*-squared also revealed that gender on all the dimensions explained the dimensions > 0.05% in this analysis. Therefore, it can be concluded that there are no significant differences in motivation in teaching and readiness as a professional teacher toward self-efficacy in ICT development by gender. Therefore, it can be concluded that the second hypotheses by gender was then accepted.

Table 5. The Result of Multivariate Test of Pre-service Teachers' Motivation in Teaching and Readiness as a Professional Teacher toward Self-efficacy in ICT Development by Gender

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Noncent. Parameter	Observed Power[c]
Intercept	Pillai's Trace	.995	1808.371[b]	10.000	100.000	.000	18083.711	1.000
	Wilks' Lambda	.005	1808.371[b]	10.000	100.000	.000	18083.711	1.000
	Hotelling's Trace	180.837	1808.371[b]	10.000	100.000	.000	18083.711	1.000
	Roy's Largest Root	180.837	1808.371[b]	10.000	100.000	.000	18083.711	1.000
Gender	Pillai's Trace	.074	.802[b]	10.000	100.000	.627	8.018	.398
	Wilks' Lambda	.926	.802[b]	10.000	100.000	.627	8.018	.398
	Hotelling's Trace	.080	.802[b]	10.000	100.000	.627	8.018	.398
	Roy's Largest Root	.080	.802[b]	10.000	100.000	.627	8.018	.398

a. Design: Intercept + Gender

b. Exact statistic

c. Computed using alpha = ,05

The multivariate test provides the analysis results of all dimensions of motivation in teaching, readiness as a professional teacher, and self-efficacy in ICT development differed by gender. Four tests were conducted: Pillai's Trace, Wilks' Lambda, Hotelling's Trace, and Roy's Largest Root. The results showed that all the p-values of the four types of tests were > .05 (F= .802 and sig.= .627). It means that all dimensions of motivation in teaching, readiness as a professional teacher, and self-efficacy in ICT development showed no statistically significant differences by gender. In other words, male and female English pre-service teachers showed the same level of motivation in teaching, readiness as a professional teacher, and self-efficacy in ICT development.

In addition, multivariate test also provides the summary of MANOVA test to identify the differences between each dimension of motivation in teaching, readiness as a professional teacher, and self-efficacy in ICT development by gender as displayed in Table 5.

Table 6. The Result of Significant Differences of each Dimension of Pre-service Teachers' Motivation in Teaching and Readiness as a Professional Teacher toward Self-efficacy in ICT Development by Age

This subsection presents the analysis result of Multivariate Analysis of Variance (MANOVA) to answer the third hypothesis, which was formulated as "*Is there any significant differences among dimension pre-service teachers' motivation in teaching and readiness as a professional teacher toward self-efficacy in ICT development by age*."

		Age
1	Physiological Needs	0,903
2	Safety Needs	0,629
3	Social Needs	0,876
4	Esteem Needs	0,557
5	Self-actualization Needs	0,321
6	Stages of Concern	0,539
7	Level of Use	0,386
8	Innovation Configuration	0,596
9	Abilities and Strategy	0,164
10	Factors Intrinsic and Extrinsic	0,218

Table 6 shows the multivariate tests of each dimension pre-service teachers' motivation in teachings' dimensions (i.e. physiological needs, safety needs, social needs, esteem needs, and self-actualization needs) and readiness as a professional teachers' dimensions (i.e. stages of concern, level of use, and innovation configuration) toward self-efficacy in ICT developments' dimensions (i.e. abilities and strategy using ICT and factors intrinsic and extrinsic using ICT) differed by age (<30, 30-41, and >41).

From the result above, the *R*-squared also revealed that age on all the dimensions explained value of > 0.05 in this analysis. Therefore, it can be concluded that there are no significant differences in motivation in teaching and readiness as a professional teacher toward self-efficacy in ICT development by age. Therefore, it can be concluded that the third hypotheses by age was then accepted.

Table 7. The Result of Multivariate Test of Pre-service Teachers' Motivation in Teaching and Readiness as a Professional Teacher toward Self-efficacy in ICT Development by Age

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Noncent. Parameter	Observed Power[d]
Intercept	Pillai's Trace	.994	1515.519[b]	10.000	99.000	.000	15155.188	1.000
	Wilks' Lambda	.006	1515.519[b]	10.000	99.000	.000	15155.188	1.000
	Hotelling's Trace	153.083	1515.519[b]	10.000	99.000	.000	15155.188	1.000
	Roy's Largest Root	153.083	1515.519[b]	10.000	99.000	.000	15155.188	1.000
Age	Pillai's Trace	.132	.708	20.000	200.000	.815	14.166	.537
	Wilks' Lambda	.871	.707[b]	20.000	198.000	.817	14.130	.535
	Hotelling's Trace	.144	.705	20.000	196.000	.819	14.093	.533
	Roy's Largest Root	.106	1.058[c]	10.000	100.000	.402	10.583	.526

a. Design: Intercept + Age

b. Exact statistic

c. The statistic is an upper bound on F that yields a lower bound on the significance level.

d. Computed using alpha = ,05

The multivariate test provides the analysis results of all dimensions of motivation in teaching, readiness as a professional teacher, and self-efficacy in ICT development differed by age. Four tests were conducted: Pillai's Trace, Wilks' Lambda, Hotelling's Trace, and Roy's Largest Root. The results showed that all the p-values of the four types of tests were > .05 (F= .708, .707, .705, and 1.058, sig= .815, .817, .819, and .402).

It means that all dimensions of motivation in teaching, readiness as a professional teacher, and self-efficacy in ICT development showed no statistically significant differences by age. In other words, the age of (<30, 30-41, and >41) pre-service teachers showed the same level of motivation in teaching, readiness as a professional teacher, and self-efficacy in ICT development. Therefore, it can be concluded that the third hypotheses by age was then accepted.

DISCUSSION

Based on the first finding, correlational analysis was employed to test the first hypothesis which was rejected. Table 3 shows relationship between pre-service teachers' motivation in teaching, readiness as a professional teacher, and self-efficacy in ICT development. The correlational analysis revealed that there was a relationship between pre-service teachers' motivation in teaching, readiness as a professional teacher, and self-efficacy in ICT development. This finding, therefore, support the findings from previous studies Hatlevik (2018), which revealed that there is a relationship between pre-service teachers' motivation in teaching, readiness as a professional teacher, and self-efficacy in ICT development.

This findings also supported by Endot and Jamaluddin (2023) who found that teachers' readiness has a relationship to ICT skills and intrinsic motivation. This point is supported by the highlights of four critical factors in this study, namely selfefficacy in ICT development, intrinsic motivation, ICT skills, and support training, as influential contributors to teachers' readiness. Among these, self-efficacy and intrinsic motivation emerge as the primary drivers, exerting the most significant impact on teacher readiness.

Furthermore, another study conducted by also Aybek and Aslan (2019) examined the relationship between pre-service teachers' self-efficacy beliefs and preparedness to teach. The fact that the pre-service teachers feel they are prepared for the teaching profession and have a high level of self-efficacy is an indicator of becoming successful teachers in the future. A significant relationship has been identified between pre-service teachers' preparedness to teach and self-efficacy beliefs. Similarly, research by Moreira-fontán et al., (2013) found that the emotions associated with self-efficacy in ICT development can enhance teachers' work motivation and degree of engagement in their daily tasks with adolescent students who cannot conceive of their lives without the new technologies.

As a result of these two factors, they are expected to show higher motivation levels. Thus, there is a relationship between pre-service teachers' motivation in teaching and self-efficacy in ICT development.

From the result on Table. 4, the *R*-squared also revealed that gender on some dimensions (i.e. stages of concern and level of use) explained the dimensions < 0.5% in this analysis. Therefore, it can be concluded that there are significant differences in motivation in teaching, readiness as a professional teacher, and self-efficacy in ICT development by gender. Therefore, it can be concluded that the third hypothesis by gender was then rejected.

This finding supports the studies conducted by (Juliana and Efeyaelu (2015) who reported that male had higher scores in computer self-efficacy than female, however they found the significant differences in the mean scores of computer selfefficacy male and female respondents. The study was in contrast to Kalemoğlu Varol (2014) study, which found that attitudes regarding ICT use are similar for male and female teachers. One possible explanation for this could be the increasing relevance of technology use in people's daily lives, including education. Pre-service teachers of males and females have equal access to ICT in the classroom experiences. Women now have a greater opportunity than ever to adopt technology (Chin-Chung & Chia-Ching, 2004). On the other hand, boys are more confident in their ICT-related skills than girls, according to a study by (Saleem et al., 2021).

For instance, as both genders receive an equal amount of ICT exposure, the contrast study also reported the findings of K. J. Yadav and Yadav's (2014) that gender did not significantly affect the attitudes of male and female student teachers. Similarly, it was discovered that the relationship between the ICT self-efficacy characteristics and gender did not significantly differ among pre-service teachers. Regarding the usage of ICT in the classroom, pre-service English teachers—male and female— perceived the same degree of self-efficacy, the same findings were found in earlier research by (Kalemoğlu Varol, 2014). One factor could be that women realized they needed to increase their ICT proficiency because it was becoming an essential skill for both their personal and professional development as well as their careers. However, a study by Zehir Topkaya, (2010) found that pre-service male teachers had a better sense of computer self-efficacy than pre-service female teachers.

In conclusion, pre-service teachers demonstrate no significant relationship between their gender and their self-efficacy in ICT development, which is related to their willingness to teach and their preparedness as professional teachers

Conversely, this last findings in line with the study by Trujillo-Torres et al., (2020) found that teachers' age is negatively correlated with their use of ICT. It also reported that no significant correlations were found between the ICT and teaching indicator and gender, age, or teaching experience. This finding suggests that pre-service teachers in the age category (<30, 3041, and >41)

have the same abilities and strategies for motivation in teaching and readiness as professional teachers toward selfefficacy in ICT development.

V. CONCLUSIONS

Regarding the findings and the results of hypotheses test of the present study, several conclusions could be drawn as follows: There is a relationship among dimension in each variable of pre-service teachers' motivation in teaching and readiness as a professional teacher toward self-efficacy in ICT development. The Sig. value shows all the dimensions had < 0.05, therefore, there is a relationship among pre-service teachers' motivation in teaching and readiness as a professional teacher toward selfefficacy in ICT development. Furthermore, The Pearson Correlation analysis technique was also used on the hypothesis with the dimensions on pre-service teachers' motivation in teaching and readiness as a professional teacher toward self-efficacy in ICT development. As the result above, there is a relationship among each dimension pre-service teachers' motivation in teaching, readiness as a professional teacher, and self-efficacy in ICT development. In other words, when teachers perceive higher motivation, they tend to positively ready as a professional teacher, and self-efficacy in ICT development. Therefore, the first hypothesis was then rejected. Then, the second is there are no significant differences between the dimensions of pre-service teachers' motivation in teaching and readiness as a professional teacher toward self-efficacy in ICT development by gender. On the other hand, teachers' motivation in teaching and readiness as a professional teacher toward self-efficacy in ICT development shows no significantly differences and on their self-efficacy in ICT development. Therefore, the second hypothesis was then accepted. The last one is, there are no significant differences between all of the dimensions on pre-service teachers' motivation in teaching and readiness as a professional teacher toward self-efficacy in ICT development by age. Therefore, the last hypothesis was then accepted.

Appropriate suggestions are made for each of the next researchers. First, the qualitative analysis would be preferable for future researchers studying the same subject in order to get a more thorough explanation or a mixed-method study with a larger sample size would be preferable. Second, pre-service teachers should possess the ICT knowledge that is required of them. They need to give themselves some space to consider how motivated they are and how prepared they are to use technology in the classroom going forward. To improve their motivation, readiness, and self-efficacy in ICT development, they must, however, set personal goals. They must also create measurable, specific objectives that are in line with their career goals and the needs of teaching in the 21st century.

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