



Pre Service Teachers’ Self-efficacy in Professional Competence Courses Offered at Faculty of Information Technology in a Private University in Salatiga

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Abstract

Having the belief of being competent in the subject area during the years of training are essential aspect for pre-service teachers. It will benefit them not only during their training or study but also when they are in their teaching duty. It tries to look at how the ICT pre-service teachers look at their own ability in relation to their professional competence which is Informatics Engineering and Computer subjects. This is a preliminary study in an effort to investigate pre-service teachers during their teacher education training. By looking at their self-efficacy in relation to their professional competence, recommendation could be made for future reference. This study employs quantitative method by using questionnaire for its data collection. It involves 130 pre-service teachers in their training. The result of the study shows that the dimensions of self-efficacy explored in this study show high interval for all three dimensions; its level, strength, and generality. This reflects that those pre-service teachers have high self-efficacy when they are attending the professional competence courses. This condition reflects that they will likely to be successful in carrying out their teaching duty provided they consistently have the high self-efficacy. Finally, some recommendations for further study are made so that this area could be more thoroughly explored.

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INTRODUCTION

The Development of Information Technology and Communication in Indonesia has influenced most of life aspects not to mention education. As a matter of fact, technology with its information explosion has changed the way the teachers perform their teaching especially to adapt to the demand of 21st century education (Philomina & Amutha, 2016). This condition also affects the way students and teacher access information for their learning. Information is accessible across time and space. Moreover, teachers could not deny the fact that they do need to use technology in their classroom.

In Indonesia, the curriculum at least indirectly requires that teachers are expected to use or integrate technology in their teaching and learning activity (Kementerian Pendidikan dan Kebudayaan, 2012). Therefore, teachers should be able to identify their self-efficacy related to their technology practice so that they could maximize their technology practice. Teachers learn their technology skills from various sources. They might obtain it through their formal education, from the trainings provided by the schools or government, or from their learning by doing experience. In relation to this, Information Engineering and Computer teachers, technically they learn and obtain the technology related skills while they are studying in the university. Therefore, how they see themselves in regard to their specific skills as their main competence before completing their degree and involve themselves in the world of teaching is important.

Having the belief that they are competent in their subject while the teachers are still in their teacher education training is important as a recent study examines that academic self-efficacy could be the predictor of academic performance (Sharma & Nasa, 2014). They describe that believing in one's own strength, capability and self-confidence is essential in achieving the target they have set. It might also serve as a support for them if they have to face undesirable situation and condition in accomplishing their task. Their study supports the idea that academic self-efficacy indeed may serve as a good predictor in academic achievement.

Self-efficacy is a personal belief on the capability or competence in performing a particular behavior (Bandura, 1993). He contends that self-efficacy will influence how people control how they function and any events that might affect their life. He further explains that self-efficacy is essential for teachers as it could influence how teachers create the learning environment for the students when they teach. It also affects the academic progress level of the students. In short, how the teachers perceive themselves are capable of organizing and execute any learning plan will impact their teaching (ibid).

When looking at self-efficacy in an academic setting, this concept will be closely related to the idea of academic self-efficacy (Pajares, 1996b). He exerts that this self-efficacy impacts on teacher's performance and the way the teachers see their performance will reciprocally influence the learning environment that they create for their learners. This shows how prominent the idea of self-efficacy for teachers. Self-efficacy itself could serve as motivator that encourage the teacher or contradictorily it might be discouragement (Bandura, 1993).

Further, according to Pajares (1996) academic self-efficacy is "individuals' perceived capabilities to attain designated types of performances and achieve specific results" (p.546). This explains that self-efficacy plays an important role for the teachers to obtain their performance and how they will come to the target they set. To put in teacher education training, the pre-service teachers will need the self-efficacy in order to perform well during their training and influence how they will perform their teaching later when they complete their training and ready to go to the field to be in-service teachers. When teachers could identify their own self-efficacy, it will benefit them in performing their teaching tasks. They will be able to set the goal of learning, they will be able to use their self-efficacy in providing the suitable training for their students based on their needs (Schunk & Pajares, 2002)

Self-efficacy could be looked through three categories; generality, level and strength. Generality means looking at the self-efficacy in general, so it does not specifically correspond to the idea of self-efficacy in academic setting. It is

more in general view. The second category is the level of self-efficacy itself whether it is high or low. As mentioned by Bandura (1993) that high level of self-efficacy could serve as motivator. It encourages people to perform their behavior. The one that results in a successful performance usually play this role. On the other hand, low self-efficacy usually influences people the opposite way. It discourages them to do something, because they might see their performance as a failure and do not want to do similar thing in the future. The level of self-efficacy usually affects the choice of the behavioral setting that people make (Bandura, 1977). The third category is the strength of the self-efficacy. It covers the quality of how strong people in any given situation. Those three categories mentioned are the ones that will be carefully investigated in this study. At least, it will provide the description of pre-service teachers' self-efficacy while they are in their teacher training. The self-efficacy explored in this study certainly is self-efficacy in academic setting.

There has been a great deal of research in the area of self-efficacy of teachers both in -service and pre-service with various teaching subjects (Anderson, Groulx, & Maninger, 2012; Balapour, Reychar, Sabherwal, & Azuri, 2019; Celik & Yesilyurt, 2013; Coughlin & Lemke, 1999; Kasalak & Dağyar, 2020). Those studies vary in exploring teachers' self-efficacy ranging from looking at how teachers look at their own capability in using technology to how self-efficacy relates to other aspects of teachers. The aim of study is to explore the ICT pre-service teachers' self-efficacy in an Indonesian context. It tries to look at how the ICT pre-service teachers look at their own ability in relation to their professional competence which is Informatics Engineering and Computer subjects. This is a preliminary study in an effort to investigate pre-service teachers during their teacher education training. By looking at their self-efficacy in relation to their professional competence, recommendation could be made for future reference.

METHOD

This study aims to investigate the self-efficacy of pre-service teachers while they are on teacher education training. It will try to describe

their self-efficacy based on the data collected during the study. As mentioned earlier, it will explore three main dimensions of self-efficacy as described by Bandura (1977); they are level, strength, and generality of self-efficacy. In investigating pre-service teachers' self-efficacy on their teacher education training, this study employs quantitative method. The literature says that quantitative study tries to seek the general tendency of responses from the participants and look at how the tendency may vary among them (Creswell, 2012). The objective set for this study aligns with the idea of finding the overall tendency, in this case is pre-service teachers' self-efficacy. It investigates how their self-efficacy which is situated in an Indonesian context may look like in general. This study tries to answer the following research question

How is pre-service teachers' self-efficacy like in an Indonesian context?

This study took place in one of the private universities in Central Java, Universitas Kristen Satya Wacana. This involved 130 pre-service teachers. They are still in their education training to be computer and informatics engineering teachers. The teacher education program itself aims to educate pre-service teachers who are equipped with all the competences as mandated by the education law in Indonesia. They have to possess the three competences; social, pedagogical and professional. The students have to pass all the courses in these areas. They do not only pass but also meet minimum grade in order to complete the program and graduate as pre-service teachers who are ready to join the competition in the teaching world. In order to complete their teacher education training, all students have to take courses in their area of competence which is Informatics and computer engineering, pedagogical courses and general courses as required in the university level.

As mentioned before, the participants of this study were the active pre-service teachers. They have already taken their required course focusing on their professional competence, any course related to their skills to be computer and informatics engineering teachers. The courses ranged from introduction to information technology to the advanced one like the one that

needs specific certification, for example CCNA for those who wanted to focus on their network skills. The self-efficacy concept being explored in this study is pre-service teachers' self-efficacy in relation to their professional competence. The study looks how those pre-service teachers see themselves in term of what they think of their ability in their professional area.

The study employed *simple random sampling*. The amount of sample is determined using Isaac and Michael Table. Using the table, it enables this study to determine the number of samples needed with the significance level of 1%, 5%, and 10%. This study uses 5% of significance level, from 130 populations there are 95 samples of students. Distribution of each batch is presented in Table 1 (Sugiyono, 2015).

Table 1. Participants of the Study

No	Students Year	Amount	Percentage (%)
1	Batch of 2019	25	26%
2	Batch of 2018	29	31%
3	Batch of 2017	21	22%
4	Batch of 2016	15	16%
5	Batch of 2015	2	2%
6	Batch of 2014	2	2%
7	Batch of 2013	1	1%
Amount		95	100%

For the data collection, this study used questionnaire. The questionnaires were in form of closed ended questions. The use of questionnaires provided practicality for the participants because they can answer by choosing the answer from the option provided (Creswell, 2003). There were 15 questions exploring Bandura's self-efficacy dimensions; level, strength, and generality. The questionnaire used likert scale with five options, strongly agree, agree, neutral, disagree, and strongly disagree. The questionnaire was tested its validity and reliability using SPSS. Based on the result of

validity and reliability tests, the comparison of r-count and r-table was obtained. The value of r-table was obtained from total respondents N=95 with 5% significance, which was 0,202. In other words, the item was valid. It meant that the data collection instruments could be used in this study as the the value of r-count was bigger than 0,202. The reliability test showed that the number of Cronbach alpha was 0,883>0,202. This signified that the instruments were reliable for collecting data for the study. Once the data collected, it was calculated using the following formula:

$$P = \frac{f}{n} \times 100\%$$

Note :

P = Scoring percentage

F = item scoring

N = Ideal Score

Result of the data processing above is the percentage data for each of answer variable. In order to obtain an overview from the percentage result then grouping of percentage result is carried out for the assessment toward the system by determining interval class that is accompanied by the category value which is appropriate to the interval formula as

$$Interval(I) = 100 \div Highest Point$$

The criteria used for determining the interval is as follows:

Table 2. Result of Interval Calculation

Interval	Remarks
81 100%	Very High
61 – 80%	High
41 – 60%	Less
21– 40%	Low
20 – 0%	Very Low

Meanwhile, the questionnaire as explained before was organized on Bandura's term of level, strength and generality. Each of the dimension were described in the following section. The levels dimension consists of five statements referring to the ability to solve or master difficult task. In this case was in relation to their subject

areas that support their study to be ICT teachers. The five items covered their opinion regarding to the following ability: to attend and pass all professional competence courses; to deal with any difficulty found in any assignment for the professional competence course; to master all the material in the professional competence course; to do all the test in the courses with any level of difficulty; to be motivated and challenged in working with difficult task in relation to the professional competence course

In the strength dimension the four items of the questionnaire dealt with the idea of the strength of not easily giving up or having the perseverance. The items explored how the pre-service teachers thought of their strength in making any effort to make their action succeeded; listed as the following the effort to do and try anything to master any material given in their professional competence courses; the effort to always get a better or even best mark if their mark was not up to the standard; the effort to always learn from their mistake from their previous assignment in any of their professional competence courses.

Not giving up in attending any professional competence courses no matter how difficult they could be. The generality dimension was represented through six items. The items were related to the belief that the pre-service teachers had in any situation. They were as follows: The belief to control their emotion so that it did not affect their learning spirit. The belief to tackle their feeling of laziness in attending any professional competence courses; The belief to think clearly if they had to deal with friends who did not support their effort in completing any assignment in their professional competence course; The belief to be able to complete any assignment in any condition even though they might feel exhausted or not too well. The belief to be able to think clearly even though they have impending deadline The ability to manage their disappointment if the result was not like what they have expected.

The questionnaires were in Bahasa Indonesia. They were distributed to the pre-service teachers who have completed their professional competence courses.

RESULTS AND DISCUSSION

This section described the result of the study and its discussion. It started by explaining the result of the questionnaire covering the three dimensioned being investigated followed by the discussion. Firstly, it explored the first dimension of Bandura's self-efficacy which was level. It aimed to see how the preservice teachers saw the level of their ability in coping with the difficulty in relation to their professional competence course. Once, it has been described quantitatively, it then explained what the strength level meant towards the idea of self-efficacy for the pre-service teachers and how it might affect their ability to pass the professional competence courses. Secondly, it explained about the strength dimension by describing how the pre-service teachers saw themselves in terms of the strength of any effort they made when they attended the professional competence courses. Lastly, it discussed the belief of the preservice teachers in their ability to cope with any level of difficulty in any situation during their professional competence courses.

The data showed that the preservice teachers in this study fall into the very high category. It was 71% (see table 1) which meant that the pre-service teachers had high level in their ability to cope with any difficulty in any of their professional competence courses. As the data suggested, the average interval of the level dimension reached more than 71%. Interestingly, the pre-service teachers who started their study in 2014 seemed to have the lowest average interval in level dimension. It indirectly reflected that they had less belief in their ability to cope with any difficulty related to their professional competence courses.

Meanwhile, the 2013 pre -service teachers had their level fall into the very high interval. It was 84% It might suggest that they had the most experience of coping any difficult task in their professional competence course compared to the later batches. Among the five items in the level dimension, it is interesting that they fall into the similar interval category which was high. Although there were two items; item 3 and 4 were in the lower end of the interval. Interestingly, both items were related to the content mastery

and test or exam for the professional competence courses. It might suggest how the pre-service teachers actually portrayed themselves in relation to their academic self-efficacy. It was closely related to their achievement their professional competence courses they took.

Another point to note regarding the level dimension reflected by the result of this study was the 2016 pre-service teachers. It showed that item 3 (which was related to the content mastery) had the lowest percentage among all; it was 57% which made this item fall into the less interval. It suggested that they had less effort in dealing with

any difficult task given in their professional competence courses. In general, however, the pre-service teachers in any year participated in this study had the high interval level dimension of self-efficacy. This result supported what Bandura (1977) claimed that the high level of self-efficacy could encourage or motivate people to take an action. In the context of this study, it encouraged the pre-service teachers to make their best effort in coping with the difficulty they might have in their professional competence course. The detail of the level of self-efficacy of the preservice teachers was displayed in Table 3.

Table 3. Level Dimension of Self-Efficacy

Aspect	Item	Batch (%)							
		2019	2018	2017	2016	2015	2014	2013	Average
<i>Level</i>	Item I	79%	74%	81%	79%	80%	60%	80%	76%
	Item II	73%	70%	75%	71%	80%	60%	100%	76%
	Item III	64%	61%	63%	57%	60%	50%	100%	65%
	Item IV	70%	63%	62%	68%	80%	60%	60%	66%
	Item V	72%	72%	68%	69%	80%	60%	80%	72%
Average		72%	68%	70%	69%	76%	58%	84%	71%
Category		High	High	High	High	High	Less	Very High	

The second dimension explored in this study was strength. It was directly related to how hard someone was trying to make an effort in order to succeed in performing their action. In this case, strength reflected the effort and the power of not easily to give up when the teachers were challenged in difficult situation during their professional competence courses. The average strength dimension of the pre-service teachers participating in this study was 83% (See Table 4. Strength). It meant that the strength dimension was in very high interval. Looking at each batch of the pre-service teachers, 85% of the preservice teachers fall into the very high interval of their strength dimension. It left them with year 2015 pre-service teachers whose strength were in high category only.

Seeing the overall percentage, the data showed that none of the pre-service teacher

batches had less interval in any of item explored in this strength dimension. The least percentage was for item IX of the 2015 pre-service teachers. It reflected that their effort for not giving up in attending the courses regardless of any difficulty they might have. Once more, the higher end of the interval belonged to the year of 2013 pre-service teachers, meaning that they were they one who had the most strength of self-efficacy. To put into the context, the pre-service teachers were willing to strongly do their best and use their power not to give up in any circumstances in their professional competence courses that they attended. The fact that the average interval was 83% reflected that the pre-service teachers were strong in any given situation (Bandura, 1977). This quality would benefit the pre-service teachers once they started to perform their duty as service-teachers.

Table 4. Strength Dimension of Self-efficacy

Aspect	Item Item	Batch (%)							
		2019	2018	2017	2016	2015	2014	2013	average
Strength	Item VI	83%	79%	80%	83%	80%	80%	100%	84%
	Item VII	90%	82%	87%	79%	80%	80%	60%	80%
	Item VIII	91%	84%	88%	83%	80%	90%	100%	88%
	Item IX	83%	80%	83%	79%	70%	80%	100%	82%
Average		87%	81%	85%	81%	78%	83%	90%	83%
Category		VeryHigh	VeryHigh	Very High	VeryHigh	High	VeryHigh	Very High	

The third dimension being looked at in this study was generality. As explained earlier, that the idea of generality corresponded to the self-efficacy in general. As suggested by the item explored in the questionnaire, it was the idea of belief of the pre-service teachers in any situation. If focused on how the pre-service teachers saw their own belief in the area of their feelings and emotional. The six items covered in the dimension of generality showed that the pre-service teachers had high interval of generality. It fell on the higher-end of the high interval. It was 77% (See Table 5 Generality). Looking at the table, it could be clearly noted that 85% of the batches of pre-service teachers participating in this study had high interval of generality dimension. It showed that they had high self-efficacy in general. Only one batch of the pre-service teachers whose generality interval was very high. It was the batch of 2013.

Meanwhile, interesting numbers to note was the 100 percentage of the 2013 batch. Four

out of six items covered in the generality dimension resulted in 100%. It suggested that the pre-service teachers in this year had the very high interval of generality dimension of self-efficacy due to the experience they had. They were being in the longest period of studying when this study was conducted. Therefore, it was in line with the source of self-efficacy described by Bandura (1977).

In short, the data has proved that the pre-service teachers of all batches had high level of generality, it showed that they believed in themselves in general to perform in any given situation including in attending their professional competence courses. The high interval of generality would surely help the pre-service teachers in achieving their target (Pajares, 1996a) not only during their academic life as pre-service teachers in training but also later on when they started to perform their teaching.

Table 5. Generality Dimension of Self-efficacy

Aspect	Item Item	Batch (%)							
		2019	2018	2017	2016	2015	2014	2013	average
Generality	Item X	76%	74%	76%	76%	80%	80%	100%	80%
	Item XI	75%	74%	79%	75%	80%	70%	60%	73%
	Item XII	74%	74%	78%	73%	80%	70%	100%	78%
	Item XII	74%	72%	73%	76%	80%	70%	100%	78%
	Item XIV	74%	69%	72%	75%	80%	70%	100%	77%
	Item XV	76%	73%	75%	79%	80%	80%	60%	75%
Average		75%	73%	76%	76%	80%	73%	87%	77
Category		High	High	High	High	High	High	Very High	

Efficacy in every batch was high because they believed that they had high ability level, not easily give up, and had confidence in any situation as suggested by the data (See Table 3, Table 4 and Table 5). The level which referred to the pre-service teachers' ability to cope with any situation they might have, the strength which reflected their perseverance and the belief to be able to deal with any situation in attending their professional competence courses. Year 2013 pre-service teachers seemed to be consistently in the very high interval for the three dimensions explored in this study. They're being the highest in the interval range could possibly be affected by the length of the study they have been through. Being in that position, it was likely that they had more experience in coping any challenging situation that contribute to their development of their self-efficacy through times. It was possible considering, they were one step ahead among other pre-services batches which meant their junior.

CONCLUSION

The overview of self-efficacy of the students of Information Engineering and Computer Education was high in the interval (75%) in attending any professional competence courses. They were high in the three dimensions; level (71%), strength (83%) and generality (77%). Noticing that the interval for the strength dimension is the highest it suggested that the pre-service teachers were very persevere in dealing with difficult situation or challenging tasks during their training as ICT teachers. It reflected that all the pre-service teachers participated in this study showed their high self-efficacy which might portray or represent the pre-service teachers who were still in their training.

Having the high self-efficacy might mean that those pre-service teachers are ready to perform their teaching confidently because they can see and believe that they are able to do so. It might also mean that they will likely to be successful in carrying out their teaching duty provided they consistently have the high self-efficacy. As Pajares (1996) mentions that their self-efficacy could affect the way they create the

learning environment later on in their teaching job.

This study has tried to explored the self-efficacy of pre-service teachers in their professional competence course by employing quantitative method. Having seen all the result, it might be useful to explore deeper about the self-efficacy with much more rich data using qualitative method. Not only can it depict complex and rich picture of pre-service teachers' self-efficacy in certain subject are, but also it will widen and deepen the exploration of self-efficacy that will contribute to the literature. Investigating on each dimension of self-efficacy thoroughly using both quantitative and qualitative methods would also contribute to the policy makers and course designer in teacher training institution so that a good design of training or course would be possible to encourage the enhancement of high self-efficacy for pre-service teachers.

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