



Exploring Source of Self-efficacy of Informatics and Computer Engineering Teacher Education Students during their Teaching Practicum

Rus Indah Sari, Krismiyati*

Universitas Kristen Satya Wacana, Indonesia

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Abstract

Self-efficacy is one of the important aspects for teacher education students. High self-efficacy helps them to be more confident in doing their teaching practices. This can also affect their future performance as pre-service teachers, especially in the ICT field. In order to understand their self-efficacy, it is necessary to explore the source of self-efficacy thoroughly. This study aims to explore the sources of self-efficacy of ICT teacher -education students of Information and Computer Engineering Education at a private university in Salatiga who have completed their teaching practicum program. This study employs qualitative methods, and uses interviews for data collection. This involves 10 student teachers as participants. The results of the study describe the sources of self-efficacy of the student teachers. It identifies four sources of self-efficacy, they are mastery experience, vicarious experience, verbal persuasion and emotional arousal. The results show that the four main sources studied in this study contributed a lot in increasing the self-efficacy of the ICT student teachers. Finally, this study offers recommendations for further research.

*Correspondence Address:
E-mail: krismiyati.krismiyati@uksw.edu

INTRODUCTION

Based on the Indonesian government regulation, teachers are defined as professional are professional educators with the main task of educating, teaching, guiding, directing, training, assessing, and evaluating students in early childhood education through formal education, basic education, and secondary education. In order to perform those tasks, teachers are required to have academic qualifications, competencies, educator certificates, physically and mentally healthy, and have the ability to realize national education goals."(Peraturan Pemerintah Republik Indonesia No. 74 Tahun 2008 ,UU No. 14 Tahun 2005)

ICT student teachers are also prepared to become educators in their field. The teaching practice program is one way to equip and train them with the necessary skills. Their experience during their teaching practices in a way shape or affect their self-efficacy in their field. (Dewanto, 2018). Before those students teachers carry out their tasks in the real world situation, they need to have 'readiness' to be a teacher (Arifin, Putro, & Putranto, 2014). Further they mention that one's readiness could be influenced by their self-efficacy.

Self-efficacy as described by Bandura, is how someone have the believe that he or she is capable of coping with any situation and result in a positive action. Self-efficacy is closely related to motivation to succeed; the higher the self-efficacy the stronger the encouragement to complete any given tasks (Al-Awidi & Alghazo, 2012)

The ICT students teachers should have high level of self-efficacy so that they could to cope with any situation in their duty (Arifin et al., 2014). High level of self-efficacy usually calms someone in performing their difficult tasks (Mukhid, 2018) including in their teaching tasks. Bandura (1977) contends that self-efficacy is a person's consideration of his ability to plan and carry out actions to achieve certain goals. The principle applies in teaching, teachers' self - efficacy bring positive impacts towards their students and themselves. (Adirestuty, 2017).

Self-efficacy will also help teachers in their work, as contended Schwarzer and Hallum it is a personal factor that can protect oneself from stressful experiences at work ((Puspitasari & Handayani, 2014). Gibson & Dembo state that teacher self-efficacy as a teacher's belief in making positive changes that affect student behavior and learning outcomes. Teachers who have self-efficacy believe that they can motivate students' learning, and can have a positive influence on their learning environment so as to improve students' academic development. As their self - efficacy influence how they plan their teaching and learning activities (Pajares, 1996)

In order to be able to enhance self-efficacy, it is important to understand the source of self-efficacy (Al-Awidi & Alghazo, 2012). There are four sources of self-efficacy as identified by Bandura. They are mastery experience, vicarious experience, verbal persuasion and emotional arousal (Bandura, 1986). According to Bandura, self-efficacy is what people believe to control their function and their surrounding environment (Bandura, 1977). It is their belief about their success in performing any task.

Apart from influencing individual's motivation, self-efficacy impacts on people's decision making to succeed. It includes predicting anything that might come up. Self-efficacy enables individual to be able to complete their task when they believe that they can accomplish it. High self-efficacy in determining their effort in dealing with difficult situations, so that they could be more persistent in their efforts to complete tasks that were previously perceived as threats. Individual with high self-efficacy will view a difficult task as a challenge that they must master rather than seeing it as a threat to be avoided(Mukhid, 2018).

Source of Self-Efficacy

There are four sources of self-efficacy as identified by Bandura (Bandura, 1986). Al-Awidi & Alghazo (2012) contends that self-efficacy theory by Bandura has given a comprehensive framework for the sources of

self-for researchers. The first source of self-efficacy is mastery experience. Mastery Experience is defined as a person's interpretation of previous experiences, authentic experiences of doing particular tasks (Bandura, 1986). He further describes that a successful mastery experience will enhance one's self-efficacy, meanwhile an unsuccessful might lower his/her self-efficacy.

A repeated success could impact self-efficacy positively. It applies for the student teacher while they are on their teaching practicum program. When they have the experience of succeeding in performing their tasks and successfully doing them repeatedly, it could enhance their self-efficacy. Student teachers, when they manage the class well, have an effective teaching and learning activity, then they will feel more confident to have their coming classes. This might increase their self-efficacy.

The second source of self-efficacy is vicarious experience (Bandura, 1986). It is the second most powerful source of self-efficacy, where an individual estimates his or her own abilities in relation to the performance of others. It is the experience that the individual has seeing their colleagues are successful in performing their task, it encourages those individuals to be able to accomplish similar task. In pre-service teacher's context, it is seeing their peers, their supervisors, or their co-teachers are successful in performing their tasks (Al-Awidi & Alghazo, 2012). Similar thing applies to the student teachers in their teaching practicum, when they observe that other teachers or friends are successful in performing their task, it encourages them to think that they could perform similarly.

The third source of self-efficacy is verbal persuasion. Bandura (1986) explains that this particular source of self-efficacy is derived from social persuasion. Being verbally and personally persuaded that he/she has the ability to complete a particular given task, it leads him/her to believe that he or she could complete the task well. Besides, he or she will put more effort in order to complete the given task, even though it might be a difficult task. For example,

a teacher is being persuaded to confidently teach, it is likely to enhance his or her self-efficacy.

Bandura (1977) states that this source is related to encouragement or despair. In this case positive persuasion will encourage self-efficacy and increase it, while negative persuasion will have a negative impact and can reduce self-efficacy values. Similarly, when the student teachers are encouraged by their fellow students - teachers, they will be able to carry out the teaching and learning activity, then this can increase their confidence in teaching and vice versa, when there is negative talk, it will have a negative influence and can reduce their confidence

The last source of self-efficacy is emotional arousal. It describes individual's emotional and psychological states (Bandura, 1986). Further he explains that individual mood, stress, fatigue, pain, anxiety, are also assumed to inform self-efficacy beliefs. Strong emotional arousal can signal expected success or failure. In general, it can be concluded that positive emotions make individuals feel more confident and competent, and conversely negative feelings such as stress, fear, anxiety, and depression can reduce self-efficacy expectations (ibid). Those responses influence self-efficacy because individual emotions affect their decision making.

Positive feelings will bring thoughts to his past achievements, while negative feelings will bring thoughts to his past failures. Thus, emotional arousal also affects the level of self-efficacy, where positive reactions will increase self-efficacy, and negative reactions will reduce self-efficacy values. For example, when someone is happy and confident in doing their job, they will find it easier to deal with difficult tasks. Conversely, when they feel anxious and worried, they will find it difficult to deal with the given task. Another example, when students feel happy and confident when they carry out their teaching and learning activity, they will be able to manage the class and carry out the tasks well. On the contrary, when a student feels anxious and worried, then they will have difficulty in dealing with situations and circumstances in the

classroom. It results in an ineffective teaching and learning activity.

This study aims to explore the sources of self-efficacy of student teachers, majoring in Informatics and Computer Engineering who have done their teaching practicum. To be specific, this study tries to answer the research question “what are the sources of self -efficacy of Informatics and computer engineering student teachers?”

The role of teachers in education is very important in the success of students’ learning. Therefore, it is important for teachers to have high self-efficacy in order to help them achieving the goal. As previously explained, self-efficacy could increase the confidence of prospective teachers, when they join the education world. In order to increase and develop this self-confidence, it is necessary to explore the sources of their self-efficacy. This study was conducted to find out more about the sources of self-efficacy of the students-teachers.

There has been a lot of studies that contribute to the understanding issues in relation to teachers (Al-Awidi & Alghazo, 2012; Arifin et al., 2014; Krismiyati, Tupessy, & Yulia, 2020; Pujaningsih & Ambarwati, 2020; Sariningsih & Purwasih, 2017; Wigati, 2018). However, self-efficacy’s sources have not been much explored especially in Indonesian context, especially in Central Java. To develop one’s self-efficacy, it is essential to understand its sources, so that it can obtain a clearer depiction of which sources should be exploited to increase teacher’s self-efficacy. Hopefully, this study could inform the prospective Informatics and Computer Engineering teachers to develop their self-efficacy based on what they might lack of.

METHODS

This study employed qualitative data analysis methods. The study was carried out for approximately 6 months. It started in September 2020 until April 2021. The subjects of the study were Informatics and Computer Engineering Education student teachers who had carried out Teaching Practicum / PPL (Field Experience

Programs- teaching practicum program hereafter) in 2019-2020 academic year. It tried to obtain the most recent data concerning in which semester the students were doing their teaching practicum. There were 10 student teachers involved in this study; 3 male and 7 female students.

The student teacher involved in this study were the students of Computer and Informatics Engineering in a private university in Central Java. They have done their two semesters of teaching practicum. They taught various courses related to Information and Technology in several schools. The courses they taught are Digital Simulation, Basic Programming, Computer System, Audio Video, Basic Graphic Design, Basic Computer and Network and ICT.

For the data collection, it employed interview. Several questions were asked during the interview to address the research question posed for this study; what are the sources of student teachers’ self-efficacy. Before they were interviewed, the participants were briefed with the four sources of self-efficacy. After making sure that all the participants understood the idea of self-efficacy and its sources, they were asked accordingly. It used open ended questions related to mastery experience, vicarious experience, verbal persuasion, and emotional arousal. There were times when the researcher improvised the question based on the given answer when needed.

This study used qualitative analysis in order to get a deeper understanding of the participants’ sources of self-efficacy. The study employed 3 steps of data analysis, starting from data reduction, data presentation and data verification. Firstly, it was data reduction. In this step, all the data were classified based on theme and category (Rijali, 2019). The data obtained from the interview were then classified into category based on the sources of self-efficacy.

The coding used in this study was both literature and data driven. The data were transcribed manually and compiled into spreadsheet for the easiness in moving around for data reduction purpose. Once the data were

classified, the ones that were not belong to any categories could be removed. The category used were mastery experience, vicarious experience, verbal persuasion and emotional arousal, there were also some sub categories emerged from each category based on the data. Therefore, the coding was also data driven. It used words that could fall into previously categories determined based on the literature.

Once all the data were classified, the data was summed up into a table identifying which participant talked about the category. It helped in the presentation stage in which corresponding data would be quoted accordingly in the discussion section. The last step is looking across the summary made in previous step to synthesize the findings and present it in discussion.

Benar selama PPL saya sudah sering mendapatkan pengalaman yang dapat meningkatkan kepercayaan diri dalam mengajar contohnya waktu saya mengajar di salah satu kelas yang sudah bosan dengan kelas yg seperti biasa lalu saya ajak untuk mengikuti kelas di luar seperti kelas alam dan siswa pun merasa antusias sekali, itu lah yang membuat kepercayaan diri semakin bertambah" (P1).

True, during my teaching practicum, I often had experiences that can increase my confidence in teaching, for example, when I was teaching in one of the classes (in which the students) were bored with the usual class, then I asked them to have outdoor class the students felt very enthusiastic, that's what made self-confidence increase" (P1 translated)

Figure 1. Example of Data Presentation

RESULT AND DISCUSSION

This section describes the results of the study and its discussion. This explored the four sources of self -efficacy. The first one is mastery experience. It discusses the experiences influence the confidence of student teachers in their teaching practicum. The second one is vicarious experience. This study examines who influences students' self-confidence during teaching practice, and how that person affects their self-confidence related to their vicarious experience. The third one is verbal persuasion. This source looks at how people affect their self-efficacy in relation to the verbal persuasion they experience during the teaching practicum program. The last one is emotional arousal. This study examines the feelings they experience during their teaching practicum and how their emotional might

impact towards their performance and finally influence their self-efficacy.

Mastery Experience

The result of the study showed that experiences influenced student-teachers' confidence during their teaching practicum program. They were student enthusiasm, good communication between students and teachers, students and teachers, and teachers' support, this fell into external factor category. In addition, internal factors influenced the level of student self-confidence in their teaching. They were self-control, material mastery and class mastery. These contributed to their self-efficacy in carrying out their teaching task. The external factors played quite a big role in influencing their self-efficacy.

The results described that student's enthusiasm was a factor that most influenced their self-efficacy during their teaching practicum. Three participants mentioned that students' enthusiasm impacted their self confidence. They explained that enthusiasm of the students created a pleasant classroom atmosphere that made them more comfortable and confident in their teaching.

Benar selama PPL saya sudah sering mendapatkan pengalaman yang dapat meningkatkan kepercayaan diri dalam mengajar contohnya waktu saya mengajar di salah satu kelas yang sudah bosan dengan kelas yg seperti biasa lalu saya ajak untuk mengikuti kelas di luar seperti kelas alam dan siswa pun merasa antusias sekali, itu lah yang membuat kepercayaan diri semakin bertambah" (P1).

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In addition, this study also showed that good communication between student teachers who were doing their teaching practicum affected their level of confidence. Three participants stated that stated that good

communication was very influential. It helped them in solving any problems they experienced during teaching practice. Through this communication they could share experiences and got useful suggestions to improve their performance and finally it impacted their self-efficacy.

Ya, selama PPL saya sangat merasakan peningkatan dalam kepercayaan diri. contohnya saat melakukan mengajar saya lebih percaya diri di depan kelas karena banyak berkomunikasi dengan siswa membuat saya lebih percaya diri, lebih percaya diri saat berkomunikasi dengan guru-guru tetap disekolah tersebut (P 4).

Yes, during PPL (teaching practicum) I really felt an increase in self-confidence. For example, when I teach, I was more confident in front of the class because I communicated a lot with students, which made me more confident, more confident when communicating with the permanent teachers at the school. (P4 translated)

Good communication among student teachers in their teaching practicum could influence their confidence. This communication played an important role in the relationship between student and teachers. Such communication could help teachers in delivering the material, motivating students to study hard, and creating good relationships that eventually would bring impacts towards the teaching and learning process. When the learning process went well, it motivated the student teachers that they were able to perform their task well.

Another factor that contributed to their self-efficacy for the student teachers during their practicum were the support they got from the in-service teachers. They were like sharing the teaching materials, any encouragement, and suggestion on how to teach. One participant mentioned the following:

Ketika ada guru yang memberi support, support ini bisa berupa makanan, materi ajar, dan cara cara mengajar yang sesuai dengan siswa di sekolah tersebut (P5)

When there were teachers who provided support, this support can be food, teaching materials, and teaching methods that were suitable for students at the school (P5 translated)

Apart from external factor, what comes from the inside of the teachers, the internal, played an important role in student teachers' self-efficacy, as described by the following participant,

Iya, saya memiliki, contohnya adalah saya bisa tenang dalam menyampaikan materi, melontarkan sesekali candaan untuk mencairkan suasana.” (P6).

Yes, I had, for example was I could be calm in delivering the material, throwing jokes once in a while to lighten the mood (P6 translated)

Moreover, the mastery of the material and class management were also important. It was one of the standard competencies required from a teacher. This competency would enable student teachers to be more confident and created a more conducive classroom atmosphere becomes more conducive so that learning objectives can be achieved.

Beside experiences that increased student teacher's self-efficacy, there were also experiences that did quite the opposite; they made them to be unconfident. There were eight participants who had these experiences. Those experiences included lack of mastery of the material, unfamiliar material, lack of teaching experience, active and critical students, lack of self-preparation, and not understanding the characteristics of each student.

As noted, mastery of the material could influence students teachers' confidence. One of the participants said,

Hal yang membuat saya tidak percaya diri apabila saya merasa kurang memahami materi sehingga saya menjadi ragu pada materi yang saya ajar (P8).

The thing that made me not confident if I felt that I didn't understand the material so that I became doubtful about the material I taught (P8 translated)

The statement showed that the student teacher in this study felt that mastering the material contribute to his self-efficacy, because it made him not so confident when he was not mastering the material well.

Another experience that affected student teachers' self-efficacy during their teaching practicum was their lack of teaching experience. The more teaching experience they had, the more confident they were in their teaching. It is important for the teachers to have these teaching experiences because it reflected their professional performance. The student teachers in this study felt that they were still lack of this teaching experience which in turn affected their confidence. Once they completed the teaching practicum program, they felt more confident and it impacted their self-efficacy.

Not knowing and understanding the characteristics of the students they were teaching also contributed to their confidence. It made them not so confidence knowing that they did not know much about their students at the start of their teaching practicum program. An interesting fact though, having active and critical students turned out to be a disadvantage for the student teachers in this study. They felt that they were not confident. It might be related to the fact that they felt they lack of teaching experience.

Iya, saya memiliki. Dikarenakan saya PPL di SMK 3 atau yang sering disebut dengan STM, memiliki karakteristik siswa yang aktif dan kritis membuat saya tidak percaya diri untuk mengajar atau menyampaikan materi di sekolah tersebut. (.6)

Yes, I had. It was because I did the PPL (teaching practicum) at SMK 3, it was known as STM (Highschool for engineering), its students characteristic were active and critical. It made me not confident to teach or deliver any material in that school. (P6 translated)

Beside understanding the characteristic of the students, student teachers' confidence was also influenced by their teaching preparation. When the student teachers had a good teaching preparation, it was likely that they would be confident in delivering the teaching and learning activity. On the contrary, when they were lack of preparation, they tend to be not confident and they felt that they could not deliver the lesson well.

Ada, ketika saya kurang persiapan saat mengajar saya jadi sedikit bingung menghadapi

situasi kelas, sehingga materi yang saya sampaikan jadi tidak maksimal. (P1)

There was, when I when I was not prepared when I taught, I was a little bit confused in dealing with class situations, so the material I delivered was not optimal. (P1 translated)

The student teachers in this study described some things to anticipate of what might happen such as trying to understand the material and be well prepared for the teaching, sharing with their peers about their teaching experience during the program and learning from in service teachers in the school in which they did their teaching practicum program. Besides, understanding and knowing the characteristic of each student and having a positive thinking helped them too. Mastery experience indeed served as one of the sources of self-efficacy for student teachers in this study. It helped to enhance their self-efficacy and the experience they obtained during their teaching practicum would be useful in their future task as in service teachers when they completed their education (Sa'pang & Purbojo, 2020).

Vicarious Experience

The third source of student teacher's self-efficacy was from their vicarious experience. This experience they obtained when they observed the people in their surroundings. When the student teachers were at schools doing their teaching practicum, they saw what happened around them in their day-to-day activity including how their peers were successful in performing their tasks. Observing and seeing that their peers or colleagues succeeded it suggested them that they could perform similarly, in a sense that they could be successful too. It made them think that it was possible for them to successfully accomplish the task assigned to them. The experience that they saw through their peers indeed affected their confidence in performing their tasks (Bandura, 2006).

In this student teachers' context, they also considered the experience of their supervisors (school teachers who supervised during their

teaching practicum) to a great contribution towards their self-efficacy. When they knew that their supervisors were succeeded in performing any task, it increased their confidence and motivated them to be successful too. The study showed that there 9 participants contended that peer's experience to have impacted on their self-efficacy, and 3 participants claimed that their supervisors' experience influenced their self-efficacy.

Seeing how people in their surrounding were successful encouraged their desire to be successful too (Mukhid, 2018). This also applied to the student teachers in this study. When they saw that their peers were able to teach and deliver the lesson successfully, it encouraged them accomplish similarly.

Selama PPL saya banyak belajar dari mereka. Semangat mereka meyakinkan saya bahwa saya bisa jadi sehebat mereka, karena ada beberapa teman yang lebih dulu PPL disana mereka punya pengalaman yang lebih banyak, jadi saya bisa belajar dari mereka. Mereka sangat baik dalam mengendalikan kelas masing-masing, penyampaian materi juga bagus, saya jadi termotivasi.(P1).

During my teaching practicum (PPL) I learned from them. Their enthusiasm convinced me that I could be as good as them, because there were some friends who did their teaching practicum there (at the same school) had more experience. I could learn from them. They were good at controlling their classes, they were also good at delivering the material, I was motivated (P1 translated)

Likewise, when the student teachers knew teachers who could perform well, it encouraged them to work better.

Dia selalu memberikan contoh yang baik ketika dikelas, cara mengajarnya sangat bagus, sehingga murid-murid juga cepat mengerti tentang materi yang beliau sampaikan. Dari situ saya banyak belajar untuk bisa seperti beliau.” (p. 10).

He always sets a good example in class, his teaching method is very good, so the students also quickly understand the material that he teaches. From there I learned a lot to be like him (P 10 translated)

Student teachers vicarious experience enabled them to increase their self-efficacy when they knew that their peers or colleagues have successfully carried out their tasks. They would feel that their peers' successes were also theirs, therefore it affected their self-efficacy.

Verbal Persuasion

Verbal persuasion might come from the encouragement of the surrounding people. The persuasion were usually words that suggested or arouse people to able to complete any given tasks. This study tried to explore any verbal persuasion that might be the source of the student teacher's self-efficacy. The verbal persuasion that these student teachers had were from their surroundings at schools such as their peers (other student teachers who did the teaching practicum at their school), the teacher supervisor, and the in-service teachers at their teaching practicum school.

There were five students teacher described that motivation and suggestion from other student teachers influenced their self-efficacy. Two student teachers explained that motivation and suggestion they got from the teacher supervisor affected their self-efficacy. One student teacher contended that any motivation they got from their peers, teacher supervisor and other in-service teachers did affect his self-efficacy.

Those encouragement and suggestion helped the student teachers to boost their spirit in accomplishing the task. This study suggested that motivation and suggestion from the peers seemed to be the highest source of self-efficacy in verbal persuasion category. There were eight student teachers who described this as the dominant factor in terms of verbal persuasion.

Mereka sangat berpengaruh bagi saya karena mereka yang selalu memberikan motivasi-motivasi untuk saya kedepannya, mereka memberikan masukan agar saya lebih baik dalam mengajar (P4).

They were very influential to me because they always provide motivation for me in the future, they provide input so that I could be better at teaching (P4 translated)

The motivation that the student teachers got during their teaching practicum program were usually words or encouragement saying that they would definitely be able to teach well, like stated by one of the student teacher below.

Beliau terus memotivasi saya dalam hal mengajar dan penguasaan kelas. Ada kata-kata beliau yang saya masih ingat 'kamu guru mereka siswa'. Meskipun masih PPL saya tetaplah guru yang mendidik mereka. Mereka selalu bilang 'kalau kamu mau kamu pasti bisa!' (P10).

He kept motivating me in terms of teaching and class management. There were words from him that I still remembered 'you are the teacher, they are the students'. Even though I was still a student teacher, I was the teacher who educated the students. They always say 'if you want you can do it! (P10 translated)

Verbal persuasion could increase individual's self-efficacy. It enabled them to try more persistently in achieving a success. With verbal persuasion, students teachers became more confident in facing and completing assignments, even the difficult ones.

Emotional Arousal

Individual's emotion also affected their level of self-efficacy. Positive emotions will make them feel more competent, while negative emotions will do the contrary on their self-efficacy (Al-Awidi & Alghazo, 2012; Bandura, 1977). This study has explored the student teacher's emotion that contribute to enhancing their self-efficacy. The first emotion was happy feeling. The student teachers were happy because during their teaching practicum program they get a lot of new experiences in teaching. They got to know the school environment and how to control themselves. The second was sad feeling. They felt this when they have failed in teaching and failed to control the class. The third was nervous feeling. This feeling was caused by their low confidence and lack of preparation in teaching. The data was summed up in the following table.

All of the student teachers in this study stated that their emotion during their teaching practicum influenced their performance as

explained by Al-Awidi & Alghazo in their study (2012). This supported what they claimed that emotion or positive feelings would bring positive impacts towards the performance of the work of the teachers. This study showed that the positive emotion of the student teachers affected their performance, increased their confidence. It also impacted towards the classroom atmosphere and the delivery of their teaching. Conversely, this study also showed that the negative emotions like sad and nervous feeling caused them to feel not confident. It then impacted the classroom atmosphere of being not conducive and the they could not control the classroom well. The nervous feeling made those student teachers not confident in delivering the teaching and learning activity.

All the student teachers in this study said that they had positive emotions. These emotions brought a good influence during their teaching. However, there were four student teachers who had negative emotions; sad and nervous. These emotions gave negative influence towards their teaching activity. One of the student teachers said:

Ketika saya gugup, saya jadi tidak PD ketika mengajar, dan materi yang saya sampaikan pun jadi tidak tersampaikan dengan baik (P7)

When I was nervous, I was not confident to teach and the material that I taught could not be well delivered. (P7 translated)

Positive emotions would have a positive impact, and vice versa, negative emotions would impact negatively towards their self-efficacy. As prospective educators, student teachers of Informatics and Computer Engineering Education must be able to manage emotions well so that they could have a positive influence, so that they will be able to improve their performance in teaching. The emotional intelligence to manage their emotions played an important part as the higher the emotional intelligence, the higher the self-efficacy (Wigati, 2018).

CONCLUSION

The four sources of self-efficacy were explored through the student teachers of Informatics and Computer Engineering who had completed their teaching practicum program. The experiences that contributed to the mastery experience category were students' enthusiasm, good communication, self-control and classroom management during the teaching. Those were the ones that enhanced their self-efficacy. The vicarious experience identified in this study were mostly from three stakeholders, other student teachers, teacher supervisor, and school's in-service teachers. Meanwhile, the verbal persuasion obtained by the student teachers in this study were in form of motivation, encouragement or suggestion to do their best during their teaching practicum. The last source of self-efficacy was emotional arousal covering two types of emotion; positive and negative emotions.

Understanding the source of self-efficacy would at least help the student teachers to be able to exploit any source that could enhance their self-efficacy for their future task when they are on duty as in service teachers. A further investigation on these sources in a bigger scale in Indonesian context would give a better understanding on student teachers self-efficacy. A mixed method approach between qualitative and quantitative will provide a vast data for bigger coverage and exploration that will be useful both for pre-service and in service teachers.

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