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The Relationship among Pre-Service EFL Teachers' Beliefs about Language Learning, Pedagogical Beliefs, and Beliefs about ICT Integration

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Abstract

This paper elucidates the relationship among pre-service teachers' beliefs about language learning, pedagogical beliefs, and beliefs about ICT Integration through survey methodology. This study employed a quantitative approach, particularly a correlational relationship to investigate the relationships among beliefs about language learning, pedagogical beliefs, and beliefs about ICT integration by utilizing *structural equation modeling (SEM).* SEM was applied to model the relationships in a set of three domains: beliefs about language learning, pedagogical beliefs, and beliefs about ICT integration. A questionnaire was administered to 103 pre-service EFL teachers who have accomplished their teaching practice in secondary schools. The results of the three types of beliefs obtained from the questionnaire were then analyzed through Structural Equation Model (SEM). It was revealed that there was a significant positive relationship between beliefs about language learning and pedagogical beliefs, and that between the former and beliefs about ICT integration, while a positive correlation between pedagogical beliefs and beliefs about ICT integration was not found. Insightful implications to EFL teaching and learning were discussed.

Keywords: teacher's beliefs, EFL, pedagogical beliefs, ICT

A. Introduction

As ICT (Information and Communication Technology) has been incorporated into almost every aspect of human life, the integration of ICT for pedagogical practices has become an emerging trend. Studies have revealed its significant role in supporting teaching and learning, including foreign language instruction (Hillar, 2010; Mellar et al., 2007). Due to its benefits, several countries, including Indonesia, have encouraged teachers to use ICT in classrooms by providing policies on ICT integration as well as ICT infrastructures and trainings (UNESCO, 2014), which Ertmer (1999) referred to as first-order enablers, or barriers, to ensure its successful integration.

In Indonesian educational context, since 2013, the Ministry of Education through the latest curriculum, *Kurikulum 2013*, has recommended ICT integration in primary, secondary, and higher education since it supports student-centered learning as one of the major goals of Indonesia's national education (Kemendikbud, 2013). This goal conforms the 21st-century teaching and learning framework, that is for students to "apply knowledge and skills in key subject areas and to analyze, reason, and communicate effectively as they raise, solve, and interpret problems in a variety of situations" (Ananiadou & Claro, 2009, p. 7), requiring teacher's ICT pedagogical skill to support its achievement. With regard to types of teacher practices, this framework shares similar characteristics as constructivist focusing on students' competencies in problem-solving, critical-thinking, and collaboration skills needed to solve authentic problems (Ertmer et al., 2015).

While eliminating the first barriers has no longer been considered an issue in some countries, teacher's resistance and ineffectiveness in integrating ICT still arises (Behar & Mishra, 2016; Chen, 2008). Hew and Brush (2007) summarized three most common barriers hindering teachers from ICT integration, one of which is teachers' attitudes and beliefs. Ertmer (1999) classified this type of barrier as second-order barriers, defined as those that are intrinsic to teachers and that confront their beliefs about current practice. Such barriers as pedagogical beliefs and beliefs about ICT integration are considered to be contributing factors toward successful ICT integration (Cummings, 2008; Ertmer, 1999; Ertmer, et al., 2012; Jimoyiannis & Komis, 2007; Johnson, 1994; Kim, et al., 2013; Prestridge, 2012).

Similarly, beliefs held by pre-service teachers may also influence their decision to integrate ICT into their teaching. Although today's pre-service teachers are classified as "digital natives" (Prensky, 2001) or "cusp generation" (Fluck & Dowden, 2011) due to their proficiency in digital technologies, they may face obstacles when implementing ICT for pedagogical practices (Lei, 2009), which might be influenced from their long-held beliefs and experiences. Their beliefs about ICT integration and ICT pedagogical practices could be traced from their pedagogical and personal beliefs shaped from their personal experiences as students and/or vicarious experiences (Ertmer, 2005; Kennedy, 1997; Liu, 2012). These experiences may eventually influence their pedagogical beliefs (Johnson, 1994; Liu, 2012) as well as their beliefs and practices of ICT (Kim, et al., 2013), reflecting the interrelation between pre-teacher's beliefs and other beliefs, and how they may be used as indicators to predict their ICT practices.

To date, ample studies have investigated the relationship between pedagogical beliefs and beliefs and/or practices regarding ICT integration (Prestridge, 2012; Sadaf, Newby, & Ertmer, 2012), and their relationship with epistemic beliefs in the context of

China (Deng, Chai, Tsai, & Lee, 2014). However, research focusing on the relationship among pre-service teachers' beliefs about foreign language learning, pedagogical beliefs, and beliefs about ICT integration, particularly in a particular context such as EFL instruction in Indonesia (see Erlenawati, 2002; Prihatin, 2012; Silviyanti & Yusuf, 2015), is scarcely available, while these beliefs are presumably intertwined (Ertmer, 2005; Johnson, 1994; Kim, et al., 2013).

Focusing on a particular pedagogical context is crucial, since different disciplinary contexts may influence teachers' ICT pedagogical practices (Deng, et al., 2014; Jimoyiannis & Komis, 2007), for example, between ICT integration in a science class and that in an English class in Indonesian education context. This study is thus aimed at investigating the Indonesian pre-service EFL teachers' beliefs about English language learning and pedagogical beliefs, and how these beliefs are related to their beliefs about ICT integration for EFL classroom practices. Understanding each of these beliefs and how they are interrelated is important to give insights on what the beliefs of pre-service EFL teachers in Indonesia are and what could be done to integrate pedagogical use of ICT constructively in EFL classrooms to achieve the learning goals set by the national curriculum.

Based on the statement above, the main problem of the study could be retrieved below:

"Are there any relationships among Indonesian pre-service EFL teachers' beliefs about English language learning, their pedagogical beliefs, and their beliefs about ICT integration for EFL classroom practices?"

The main objective of the study is to investigate the relationships among Indonesian pre-service EFL teachers' beliefs about English language learning, their pedagogical beliefs, and their beliefs about ICT integration for EFL classroom practices. This objective is ramified into three sub-objectives based on the postulated hypotheses as follows:

1) to investigate whether there is a positive relationship between Indonesian pre-service EFL teachers' beliefs about language learning and their pedagogical beliefs.
2) to investigate whether there is a positive relationship between Indonesian pre-service EFL teachers' beliefs about language learning and their beliefs about ICT integration.
3) to investigate whether there is a positive relationship between Indonesian pre-service EFL teachers' pedagogical beliefs and their beliefs about ICT integration.

Through this study, it is expected that barriers that hinder Indonesian pre-service EFL teachers could be identified, and eventually be solved, so resistance and hesitation toward ICT integration could be avoided. Similarly, pre-service EFL teachers' experiences and capabilities on ICT use in general and in EFL context in particular, would expectedly be able to be recognized, which would benefit them in its integration into EFL instruction.

B. Literature Review

1. Beliefs about Language Learning

Beliefs about language learning have been attracting considerable research interests. It has been recognized that beliefs about language learning are context-specific and learners from different cultures may have different attitudes, approaches to, and opinions about learning a new language (Nikitina & Furuoka, 2006). One study which was conducted by Kuntz (1996) showed that students of Arabic do hold unique beliefs concerning language learning. They showed preferences associated with communication strategies and people of the target language countries.

Focusing on the study of EFL, several studies resulted that to maximize learning, it is crucially important to consider beliefs about language learning. A study within the context of Indonesian learners regarding their beliefs on EFL learning revealed the prominent role of English-based environment and less emphasis on grammar instruction as factors they believed to contribute toward successful EFL learning (Erlenawati, 2002). Meanwhile, one study reported a positive correlation between language proficiency and beliefs about language learning among Iranian students (Abdolahzadeh & Nia, 2014). Another study which was conducted by Vibulphol (2004) reported that beliefs about language learning of the pre-service EFL teachers in Thailand were mostly consistent in the survey before and after their practice teaching, and there was a relationship between their beliefs about language learning and their teaching approaches. The beliefs that appeared to influence the extent to which the pre-service teachers focused on form or meaning are "self-efficacy or beliefs about one's own English ability, beliefs about the importance of grammar, and beliefs about the difficulty of English skills" (Vibulphol, 2004, p. 264). These findings, hence, imply that the relationship between beliefs about language learning and pedagogy exists.

Regarding the various results of the study on beliefs about language learning, Nikitina and Furuoka (2006) study allows us to conclude that Horwitz (1988) instrument is a suitable tool for research on language learning beliefs in various sociolinguistics setting regardless of the language being learned. Notably, in this present study, to measure the participants' beliefs about language learning, a scale was developed by analyzing previous beliefs about language learning questionnaire. Although Horwitz (1988) scale has been standardized for specifies use for university students, the wording in the scale was revised so that each item would be relevant to the participants and the context in this study.

In relation to language learning beliefs and ICT use, a number of enduring issues is included into understanding how learning occurs, learning with or about the technology, and the role of the teacher and professional development in using ICT. A study about language learning and ICT use was once done by Klimova and Kacet (2015) describing how learning occurs using ICT. They utilized hybrid learning by integrating face-to-face and fully online instructional components, innovative use of technology, reconceptualization of the learning paradigm, and sustained assessment and evaluation of blended learning. Meanwhile, Martins (2015) claimed that by learning with and about the technology, an innovative and very positive contribution for English language learning might take place. The students' active involvement in solving authentic tasks, the encouragement of cultural awareness, and the development of individual and collaborative competences all attest the importance of social networks,

wikis, and podcasts in learning EFL. Thus, teachers need to relate and transform their tacit and professional knowledge with the opportunity and demands presented by ICT (Watson, 2006). These positive research results are confirmed by Öz (2015) study that indicated a slight positive correlation between cognitive, affective, and behavioral components of foreign language learning and computer assisted language learning.

2. Pedagogical Beliefs

Pedagogical beliefs are defined as underlying beliefs about teaching and learning, which are commonly categorized as either traditionalist or constructivist (Ertmer, 2005; Ertmer, et al., 2015). The traditional approach emphasizes on teacher-centered learning, characterized by teachers' role as an authority in the classroom and takes control of the pedagogical content and activities, students' behavior, and classroom environment, while the students merely become passive recipients (Deng, et al., 2014). Meanwhile, those holding constructivist beliefs treat students as the center of learning. Constructivists focus more on students' competencies that are required in the 21st century, some of which include critical thinking, problem solving, communication, and collaboration (Ananiadou & Claro, 2009). In this approach, teachers play a role as a facilitator who designs and implements classroom teaching and learning activities that could stimulate students' active participation and that align with 21st century framework. Between the two axes of this pedagogical beliefs continuum is a combination of traditional and constructivist, known as eclectic beliefs, held by the majority of teachers found in Tondeur et al. study (2008). In this type of beliefs, teachers utilized different types of beliefs depending on aspects like the contents and students' needs.

Attempts have been made to investigate the relationship between teachers' pedagogical beliefs and their beliefs about ICT integration and/or ICT practices, based on an assumption that different values and beliefs teachers have on pedagogical practices may lead to different ways of integrating ICT in the classroom (Ottenbreit-Leftwich, et al., 2010). Presumably, traditional teachers tend to treat ICT as an additional tool to help teachers explain materials, send assignments, and search for materials on the Internet (Ertmer, et al., 2012), while constructively ICT is considered as a cognitive tool that encourages students to incorporate their critical-thinking, collaboration, communication, and problem-solving skills into their learning to solve authentic problems (Ertmer, et al., 2015). Whereas several studies revealed the influence of teachers' pedagogical beliefs on their beliefs about ICT integration (Deng, et al., 2014; Ottenbreit-Leftwich, et al., 2010; Prestridge, 2012), others found discrepancies between these beliefs as well as between pedagogical beliefs and their ICT pedagogical practices (Chen, 2008; Judson, 2006). Ertmer et al. (2015) postulated several reasons that might lead to these inconsistencies, some of which are difficulties to measure beliefs as intangible factor, different weight teachers hold on each of those beliefs, and different cultural contexts. This lack of consensus on the relationship between these two beliefs makes research investigating this relationship becomes crucial to confirm the findings on whether (or not) a correlation exists between them.

3. Beliefs about ICT Integration

The term ICT (Information and Communication Technology) is usually coined with terms like "computer" (Cummings, 2008) and "technology" (Johnson, 1994).

While the former might represent one particular ICT device, the latter takes even broader sense. The closest term might be the one used by Ertmer, et al. (2015), "digital technology," or "Web 2.0" (Sadaf, et al., 2012). To specify what constitutes ICT and how it is relevant with the 21st century teaching and learning, a comprehensive definition is needed. Toomey (2001) defined ICT as

> …technologies that are used for accessing, gathering, manipulating and presenting or communicating information. The technologies could include hardware (e.g. computers and other devices); software applications; and connectivity (e.g. access to the Internet, local networking infrastructure, videoconferencing). What is most significant about ICT is the increasing convergence of computer-based, multimedia and communication technologies and the rapid rate of change that characterizes both the technologies and their use (para. 3).

The aforementioned definition reveals the types of technologies, the functions, and the relationship between the technologies and their use, which constitutes the educational concepts of "computer," "technology," "digital technology," and "Web 2.0" altogether. These terms are thus considered synonymous in this current study, and the use of either of them is interchangeable.

The emergence of ICT particularly in education has triggered plenty of studies in this area in order to gain full potentials of its effectiveness for teachers as well as students. Markauskaite (2007), for instance, identified the role of ICT capabilities among trainee teachers, including two ICT-related general cognitive capabilities (problem solving, and communication and metacognition), and three technical capabilities (basic ICT capabilities, analysis and production with ICT, and information and Internet-related capabilities). Within the context of EFL in Indonesia, Prihatin (2012) focused on how EFL university lecturers integrated ICT into their teaching. It was revealed that the lecturers addressed Communicative Language Teaching Method in ICT-mediated EFL instructions by utilizing the concept of "relate, create, and donate" to engage students. Meanwhile, Silviyanti and Yusuf's (2015) study on EFL teachers' perceptions on using ICT resulted in two opposing groups: the one with high motivation to integrate ICT and the other with low motivation despite the fact that both have positive perceptions regarding ICT integration. In China, Sang(Ertmer, et al., 2015) et. al (2010) study revealed the potential relationship between pedagogical beliefs and beliefs about ICT integration based on their findings on how Chinese pre-service teachers' constructivist beliefs predict their computer self-efficacy and positive attitudes towards ICT. Beliefs about the potentials of ICT as an educational tool and its integration in education were also investigated (Jimoyiannis & Komis, 2007). While literatures have highlighted the effectiveness of a particular ICT tool and/or application to improve students' learning, several studies have begun to shift focus onto investigating the role of teachers' beliefs about ICT integration and/or their ICT practices due to its presumed contribution toward successful ICT integration (Ertmer, et al., 2015). However, since there has not been any consensus particularly regarding the relationship between teacher pedagogical beliefs and ICT integration, a study in this area becomes crucial.

C. Research Methodology

Based on the theoretical framework, the present study proposes a hypothesized model illustrating the presumed relationship among teachers' beliefs about language learning, pedagogical beliefs, and beliefs about ICT integration, which is shown in Figure 1.

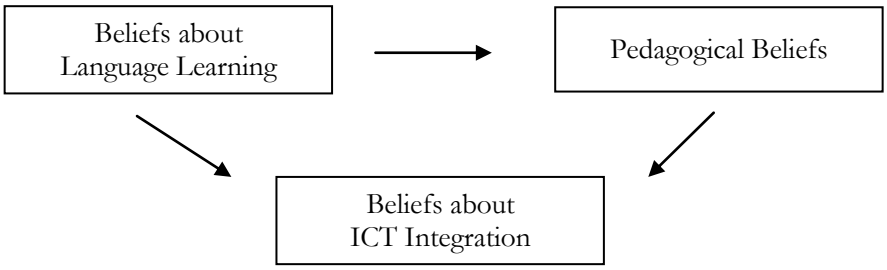

Figure 1. A hypothesized model for the relationships among beliefs about language learning, pedagogical beliefs, and beliefs about ICT integration

There were 150 senior undergraduate students majoring in English Language Education from a public university in Indonesia were initially involved as the participants of the study. They had accomplished their six-week in-school teaching practice as a requirement prior to graduation. This choice was based on the consideration that their teaching experiences during teaching practice would help them shape their pedagogical beliefs and beliefs about ICT integration, which was needed to be able to respond to the questionnaire. The questionnaire, online as well as paper-based, was distributed to them to find out the relationships among the three types of beliefs they may (may not) hold, but only 103 returned it. Thus, this number was treated as the number of the participants in the current study.

This study employed a quantitative approach, particularly a correlational relationship to investigate the relationships among beliefs about language learning, pedagogical beliefs, and beliefs about ICT integration by utilizing *structural equation modeling (SEM).* SEM was applied to model the relationships in a set of three domains: beliefs about language learning, pedagogical beliefs, and beliefs about ICT integration. Each of these variables consists of several dimensions constructed based on the literature in the area as seen in Table 1.

To elicit information regarding the relationship among pre-service teachers' beliefs in language learning, pedagogical beliefs, and beliefs about ICT integration, a scale was utilized. It is an EFL pre-service teachers' beliefs questionnaire on a 4-point Likert scale (4= strongly agree; 3= agree; 2= disagree; 1=strongly disagree) adapted from theories on beliefs about language learning (Horwitz, 1988), pedagogical beliefs (Chen, 2008), and beliefs about ICT integration (Jimoyiannis & Komis, 2007); (Cummings, 2008). This questionnaire initially consisted of 64 questions altogether, spreading out into three sections. The first section on the first page comprised 7 items on pre-service EFL teachers' experiences with ICT in learning English. The second section was a 4-point Likert scale, divided into three sub-sections, each of which represented the different types of beliefs: beliefs about English language learning (19 items), pedagogical beliefs (10 items), and beliefs about ICT integration (27 items). The last section consisted of one item asking pre-service EFL teachers to identify the

language skill and/or component that would be more effectively taught with the integration of ICT.

Prior to distributing the questionnaire, it first went through content validation from an expert in ELT. Once validated and revised, the questionnaire was then tried out to 42 students who were excluded from the participants, and then analyzed for its internal consistency and reliability using *Cronbach Alpha coefficient.*

Table 1. Research domains and dimensions

No	Domain	Dimension
1	Beliefs about Language Learning	• The difficulty of language learning • Foreign language aptitude • The Nature of language learning • Learning and communication strategies • Motivation and expectation
2	Pedagogical Beliefs	• Instructional Purposes • Characteristics of learning tasks • Constraints and supports of instructional situations
3	Beliefs about ICT Integration	• Instructional use • Teacher role • Technical competence

From the try out, the questionnaire validation was measured based on Pearson Product moment correlation, and it was found that among 59 items, 9 of which were not valid (item no. 20, 32, 34, 36, 39, 42, 48, 50, and 59) so they were eliminated. For the reliability, the indices of the questionnaire sections were provided as follow: firstly, belief about EFL learning consists of the difficulty of language learning (4 items, α = .304); foreign language aptitude (2 items, α = .352); the nature of language learning (5 items, α = .741), learning and communication strategies (5 items, α = .673), and motivation and expectation (3 items, α = .720). Secondly, pedagogical beliefs include instructional purposes (5 items, α = .640), characteristics of learning tasks (3 items, α = .586), and constraints and supports of instructional situations (2 items, α = .684). Thirdly, beliefs on ICT integration deal with instructional use (10 items, α = .680), teacher role (4 items, α = .320), and technical competence and anxiety (7 items, α = .621). Hence, it could be concluded that the *Cronbach's* alpha values for all the dimensions in the questionnaire were all above R table 0.304 (reliability table db: n-2=40), indicating adequately reliable items of all dimensions.

The data collection process began by inviting all the participants through e-mail and instant messenger to come to a designed time and place and fill out the questionnaire. Those who could not come at the designed time were given a chance to fill it out online through *Google Forms* and submit it prior to the deadline set. Of all the questionnaire sheets distributed, 103 were returned and they were ready for analysis.

The data analysis proceeded through several steps. First, to conduct descriptive statistics (means, standard deviations, and percentage), reliability analyses of the scales, and inter-correlations between the variables under investigation, *SPSS 20* was utilized. Second, the *Chi-square tests of Independence* was conducted to check whether there were significant relationships of the tested model of beliefs about language learning,

pedagogical beliefs, and beliefs about ICT integration. Third, *SEM* analysis was applied using Analysis of *TETRAD* software (version 18) to evaluate the relationships between the three variables investigated in this study. In that respect, SEM is useful for investigating how well a theoretical model explains the interrelationships among a set of variables (Apriyanti, Mantoro, & Ayu, 2014) and whether potential cause-effect relationships exist on correlational data (Dornyei, 2007). That is, as mentioned by Sasaki (2016), by using SEM, whether a theory-driven model fits the observed data to a statistically significant degree could be determined. Fourth, after knowing the values of the relationship, the relationships were determined to have high or low correlation, and whether their relationships were significant or not significant.

The schematic representation of the hypothesized model would show prediction on the relationships among the latent variables/factors (beliefs about language learning, pedagogical beliefs, and beliefs about ICT integration). After *SEM* was applied, several figures showing the relationships would appear. When the figure shows negative, it means the relationship is negative, unless it presents positive figure, meaning that the relationship is positive, and thus rejects the null hypothesis. Regarding the strength of the relationship, the range of a figure between 0.99-0.60 reflects a considerably high relationship, while a figure between 0.59-0.49 represents a medium relationship, and 0.59-0.10 represents a low relationship. Knowing the obtained significant value is also important to know whether the value is significant (below 0.05) or not significant (exceed 0.05) (Butler, 1985).

D. Findings

From the means and standard deviations of the variables under investigation as in Table 2, it revealed that some correlation between variables on ICT and variables on pedagogical beliefs and beliefs about language learning were not significant due to the negative values obtained.

Table 2. Means and Intercorrelation among variables on Beliefs about language learning, Pedagogical Beliefs, and Beliefs about ICT integration

	M	SD	1	2	3	4	5	6	7	8	9	10	11
1. L1	2.9792	0.3571	-										
2. L2	3.3796	0.473	.313**										
3. L3	3.2	0.4418	.378**	.378**									
4. L4	3.113	0.4158	.238*	.262**	.485**								
5. L5	3.358	0.4618	.323**	.253**	.472**	.531**							
6. P1	3.2741	0.4098	.390**	.267**	.402**	.289**	.408**	.604**					
7. P2	3.1852	0.4098	.390**	.267**	.382**	.261**	.291**	.436**	.522**				
8. P3	3.4167	0.481	.271**	.249**	.456**	.371**	.451**	.504**	.588**	.501**			
9. ICT1	2.9824	0.3298	-0.008	0.14	.327**	.354**	.445**	.308**	.355**	.211*	.319**		
10. ICT2	2.7292	0.3619	-0.061	-0.042	0.054	0.079	0.123	0.075	0.178	0.2398	0.182	.261**	
11. ICT3	2.5582	0.5001	-.336*	-0.039	0	0.096	0.116	-0.001	0.042	-0.072	0.006	.44**	.225*
**** Correlation is significant at the 0.01 level (2-tailed)**													
*** Correlation is significant at the 0.05 level (2-tailed)**													

Note. SD= standard deviation; M= mean; L1= The difficulty of language learning; L2= Foreign language aptitude; L3= The Nature of language learning; L4= Learning and communication strategies; L5=

Motivation and expectation; P1= students' background; P2= instructional purposes; P3= characteristics of learning tasks; P4= constraints and supports of instructional situations; ICT1= instructional use; ICT2= teacher role; ICT3= technical competence and anxiety.

However, regarding the model fit analysis, the results of the *Chi-square tests of Independence* were quite satisfying as Table 3 illustrates.

Table 3. Model statistics

	CHI SQUARE	df	BIC SCORE	P VALUE
MODEL	2267,801	1145	-3103,79	0.000

Table 4.2 informs that the degree of freedom was 1145, Chi Square was 2267.801 and the p value was 0.0000. According to Kline (2005, as cited in Liu (2012)), the suggested X^2/df value is < 3. For this model, $X^2/df = 2267.801/1145 = 1.97$ (< 3), the value was adequate. It means that all other values related to model fit indices were favorable; that is the research model had a good fit. Besides, these correlations were significant at a $p = 0.000$ (< 0.05) level.

Some insignificant correlations found from the previous results of the means and standard deviations of the variables confirmed the findings of the SEM analysis.

The results in Figure 2 support the hypotheses; except for pedagogical beliefs and beliefs about ICT use.

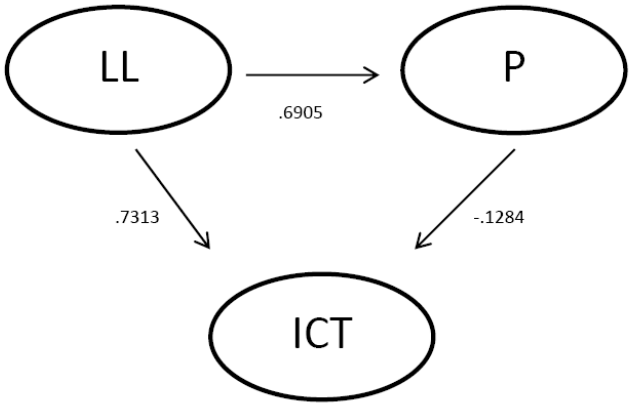

Figure 2. A Structural Equation Model Results (Final Model)

The findings indicate that beliefs about EFL learning (LL) have positive relationships with pedagogical beliefs (P) (.6905) and beliefs about EFL learning (LL) have positive relationships with beliefs about ICT use (ICT) (.7313). Yet, pedagogical beliefs (P) have negative relationship with beliefs about ICT use (ICT) (-.1284). In the structural equation model, significant paths obtained were leading from beliefs about EFL learning and beliefs in ICT use compared to EFL learning and pedagogical beliefs.

More specifically the correlations between variables on ICT and variables on pedagogical beliefs were presented in Table 4.

Table 4. Pearson correlation between variables on Pedagogical beliefs and variables on ICT

	P1	**P2**	**P3**
ICT1	.355	.211	.319
ICT2	.178	.239	.182
ICT3	.042	-.072	.006

Note. P1: instructional purposes; P2: characteristics of learning tasks; P3: constraints and supports of instructional situations. ICT1: instructional use; ICT2: teacher role; ICT3: technical competence and anxiety.

Table 4 reveals the correlations between variables in ICT integration and variables in pedagogical beliefs were considered low because the correlation values were lower than 0.5 (Butler, 1985).

Overall, the aforementioned findings reject the two null hypotheses ($H_0$1 and $H_0$2), except for $H_0$3, in which there is no positive relationship between pedagogical beliefs and beliefs about ICT integration.

E. Discussion

The current study focused on investigating the relationships among beliefs about language learning, pedagogical beliefs, and beliefs about ICT integration**.** The model that has been confirmed by SEM, as illustrated in Figure 2, indicates that beliefs about language learning and pedagogical beliefs divergently correlate to beliefs about ICT use. Regarding the relationship between beliefs about language learning and pedagogical beliefs, the analytical results corroborate the theories and previous studies as in Mahfouz and Ilmeidah (2009); Rahimi and Yadollahi (2011); and Öz (2015). This represents how students' experiences in learning a language, which presumably shapes their beliefs about language learning, may influence their pedagogical beliefs.

Likewise, the positive relationship between beliefs about language learning and that about ICT integration may indicate that overall attitudes towards ICT can be predicted by student-teachers' attitudes towards foreign language learning since these two constructs are interrelated. This suggests that student-teachers' positive attitudes towards foreign language learning and ICT integration will greatly enhance their performance both in the subject matters, namely learning EFL and using ICT. Obviously, this will, in turn, lower computer and or technology resistance among language users in ICT-based curriculum (Dutta, Geiger, & Lanvin, 2015; Watson, 2006).

The similar pattern of relationship, however, was not reflected in the pedagogical beliefs and beliefs about ICT integration, although the result of model fit analysis reveals the proposed research model has a good fit (see Table 3). This is congruent with some previous literature exposing negative correlation between pedagogical beliefs and ICT practices (Chen, 2008; Ertmer, 2005; Ertmer, et al., 2015; Judson, 2006). While positive relationship was found in Prestridge (2012) and Deng, et al. (2014), particularly with regards to constructivists-oriented pedagogical beliefs and beliefs about ICT use, the same case did not apply for traditional pedagogical beliefs in the latter study. This

reveals that pedagogical beliefs do not always align with beliefs about ICT integration as well as ICT practices.

Several reasons might be contributed to these discrepancies. Jimoyiannis and Komis (2007) argued that difficulties in measuring teacher beliefs and teachers' different order of importance on the conflicting beliefs held might explain why there were inconsistent findings on the relationship between these two types of teacher beliefs. The former might be reflected from the lack of respondents involved and the instrument used in this study which might not be sensitive enough to capture the respondents' responses regarding their pedagogical beliefs and beliefs about ICT integration, and how they may (or may not) positively associated, as the similar case was also encountered in Park & Ertmer (2014). Additionally, several technical terms and expressions used in the instrument, such as the term "ICT," might have not been clearly defined and clarified, misleading the respondents from choosing the most appropriate response that accurately represented the values they held. Meanwhile, issues on order of importance in beliefs were addressed in Ertmer, et al.'s (2012) study in which teachers' beliefs on encouraging students to use technology in any way may have outweighed their beliefs that students should be exposed to technology-based student-centered learning activities. This apparently explained the mismatch between beliefs and practice in their study, which pre-service teachers in the current study might also experience. Interviewing in-service and pre-service teachers might thus benefit future researchers in identifying what beliefs which they put more priority on than other beliefs, which may interfere the way they integrate ICT pedagogically.

In addition to the aforementioned reasons, Ertmer, et al (2015) claimed that cultural context in which beliefs are enacted might be responsible for these inconsistencies. In the case of Indonesian educational culture, teachers have long been considered as the center of knowledge, and thus are supposed to provide knowledge to the students instead of letting them search it on their own (Sutjiono, 2005). This has brought about a particular form of values and identity that might be reflected in their ICT practices in the classroom. Asking them to shift their pedagogical paradigm, say from traditional- to constructivist-based teaching, might lead to inconsistent use, or even resistance, on ICT integration, which could be seen in Indonesian educational context (Apriyanti, et al., 2014), Chinese (Deng, et al., 2014), and Taiwanese (Chen, 2008).

Lack of experiences in ICT pedagogical activities might also explain this discrepancy in the current study. Pre-service teachers' sufficient knowledge on ICT may not guarantee a successful ICT integration (Lei, 2009), particularly when vicarious experiences were inadequately gained (Ertmer, 2005; Wang, Ertmer, & Newby, 2004). Thus, providing pre-service teachers with technological-pedagogical-embedded trainings by incorporating technological pedagogical content knowledge (Mishra & Koehler, 2006) and practices, and taking teacher educators' role model and helpful guidance in integrating ICT pedagogically into account (Liu, 2012), would expectedly enrich their personal as well as vicarious experiences that would shape their beliefs and be reflected in their ICT classroom practices.

Within the context of Indonesia, the first barriers in ICT integration are apparently still a major issue, which is failed to be taken into account in the current study. The 2015 Networked Readiness Index reported that Indonesia ranked 79th

among 143 countries and only 16% of the population is connected to internet (Dutta, et al., 2015). Likewise, lack of institutional support, insufficient ICT funding, and unqualified ICT staff are additional challenges addressed by Lim and Pannen (2012) in their study involving four Indonesian teacher education institutions. This might explain why the pre-service EFL teachers in this current study, who have positive experiences in using ICT to learn English and thus lead to their positive belief about it, may negatively believe its success pedagogically due to the existing barriers.

The findings of the study may also bring about some implications for EFL instructions, particularly as far as pre-service EFL teachers are concerned. Their positive beliefs about EFL learning and pedagogical beliefs could be further shaped through the positive influence and role model of EFL instructors (Horwitz, 1988) by providing modeling of innovative EFL instruction and personal guidance (Deng, et al., 2014) that effectively integrate ICT. This shared knowledge and practices would expectedly broaden the pre-service teachers' experiences and ideas of how to effectively integrate ICT pedagogically, which may eventually shape their positive beliefs about ICT integration, as Kumaravadivelu (1991) asserts that successful instruction occurs when teacher's and students' beliefs are in accord. Another implication for EFL instruction is that professional development programs should go beyond teacher training that emphasizes the use of blended learning, online application, and social media as medium of instructions. Feasible examples of effective technology integration should be ready and available to teachers so that they would improve their teaching by utilizing technology (Chen, 2008).

F. Conclusion

This study has unveiled that it verifies the current literature studying how beliefs in language learning and pedagogical beliefs play a role in their use of ICT. This study confirms that the student-teachers beliefs when they are learning English may predict their teaching practice. The associations between beliefs about language learning, pedagogical beliefs, and beliefs about ICT use have been found to be significant, with positive relationship, albeit the association between pedagogical beliefs and beliefs about ICT use. It appears that the latter might be related to the discrepancies between beliefs on constructivist teaching and the constructive use of ICT. Research on the relationship between teachers' types of pedagogical beliefs, traditional and constructivist, and how they integrate ICT into actual teaching practices is thus worth conducting to check the consistencies of the relationship.

Similarly, since the first-order barriers such as ICT infrastructures and educational software, were ignored in this study, further studies investigating the first-order and second-order barriers in ICT integration, and how each of them might contribute to beliefs about ICT integration and/or ICT practices are worth conducting, considering that first-order barriers are still a fundamental issue in some countries. Indonesia is no exception particularly due to lack of ICT infrastructures and tools in several parts of Indonesia.

Eventually, it is highly suggested that future research further confirm the findings through both qualitative and quantitative methods. Studies focusing on how student-teachers' language learning beliefs affect their pedagogical beliefs, particularly when applying ICT in the teaching practices. In addition, given a potential number of

student-teachers in universities in Indonesia, numerous studies would be necessary to ascertain the present findings.

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