VOCATIONAL TECHNICAL HIGH SCHOOL TEACHERS' BELIEFS TOWARDS ICT FOR THE 21ST CENTURY EDUCATION: INDONESIAN CONTEXT

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Abstract

To facilitate educational staff, especially teachers with adequate information and communication technology (ICT) tools and its integration, has been one of the main agendas in vocational high schools around the world. One of the key factors of the ICT integration success in education is teachers' beliefs. To understand the phenomenon, this mix method study aimed at elaborating Vocational Technical High School (VTHS) teachers' beliefs on the ICT and its integration in education and differences of the teachers' beliefs between demographic information. Quantitatively, a survey was addressed to 765 respondents; the analysis was descriptive using mean, percentage, and standard deviation, as well as t-test and analysis of variance (ANOVA) for a difference between the demographic information namely genders, ages, and teaching experiences. Following the quantitative phase, interview was conducted with 10 teachers to get in-depth information through a thematic process. Findings suggest that the VTHS teacher's beliefs on ICT and its integration in education mainly focused on 1) student engagement and effective learning, varied use of ICT regarding grades and content (behavioral beliefs); 2) needs of digital-age students and expectations of authorities, administrators, and colleagues (normative beliefs); 3) varied self-efficacy for using ICT in VTHSs, access to learning, access to ICT and human resource support (control beliefs).
Keywords: *beliefs, ICT, mix method, vocational technical education.*

Introduction

Information and communication technology (ICT) transforms the artery of the global system including in the field of education which transfers information, knowledge, and communication in various fields of education. One of the educational fields is vocational education. In line with the rapid change of ICTs development in education, Vocational Technical High School (VTHS) corps; schools' administrators, administration staff, teachers, and students should be well-prepared to face the new culture of teaching and learning skill's requirements for the 21st century education (Chai, Tan, Deng, & Koh, 2017; Göksün & Kurt, 2017) to produce and develop numbers of knowledgeable and skilled vocational school graduates.

In Indonesia, Ministry of Education and Culture (MoEC) is in charge for vocational

institutions or schools (MoEC, 2013). Teachers in these schools often experience the increase of pressures to integrate ICT in instruction due to the high-end development of technology, initial steps of institutional educational innovation, and transformative students' expectations, as well as other social demands (Bliuc, Casey, Bachfischer, Goodyear, & Ellis, 2012). Regarding these pressures, the potential advantages of ICT-enhanced instruction such as e-learning, mobile learning, and massive open online course are tried to be implemented in MoEC institutions including in the vocational schools (MoEC, 2013). Therefore, many of the institutions have been equipped with ICT tools for education and ICT-based training for teachers' professional development (MoEC 2013).

Recently, there has been much research conducted in the field of educational technology published by top-tier journals around the world but most of the research mainly focused on general education systems; high schools or higher institutions (e.g. Arukaroon & Krairit, 2017; Li, H., Gobert, Graesser, & Dickler, 2018; Tuapawa, 2017). In Indonesian context, similar phenomenon also happened where most ICT integration studies focused on general education institutions (e.g. Habibi, Mukminin, Riyanto, Prasojo, Sulistiyo, Sofwan, & Saudagar, 2018; Lim & Pannen, 2012; Prasojo, Mukminin, Habibi, Marzulina, Muhammad, & Harto, 2018; Tsai & Chai, 2012). Few studies have been conducted in relation to the integration of ICT in vocational institutions (e.g. Deaconu, Dedu, Igreț, & Radu, 2018; Khan & Markauskaite, 2017). Even fewer studies were done in Indonesia (Marwan & Sweeney, 2010; Retnawati, Hadi, & Nugraha, 2016). To fill the gap, this research, therefore, focused on the ICT integration in vocational education. Specifically, this research mainly aimed to elaborate Indonesian VTHS teacher's beliefs on ICT and its integration through mix method study; survey and interview.

Literature Review

ICT in Education; VTHS Context

The roles of ICT in all kinds of schools is now massive and excessive. At some points, it reaches most school accessed areas in either developed or developing countries (Deng, Chai, Chin-Chung, & Min-Hsien, 2014; Kimmons, Miller, Amador, Desjardins, & Hall, 2015). Due to this phenomenon, all teachers including VTHS teachers are expected to utilize ICT in their instructional activities (Khan & Markauskaite, 2017). ICT integration during instructional activities has been a very essential requirement for current teachers (Kimmons et al., 2015). Therefore, studies for technology integration should be sustainable and up to date. However, integrating technology into instruction is sometimes perceived as additional tasks for teachers in education because they tend to focus more on their daily tasks; managing lesson plans, delivering teaching, doing evaluations, and organizing classrooms (Armstrong, Hensen, & Savage 2009). As a result, technology integration is perceived as an exhausting activity for some teachers (Kilinc, Tarman, & Aydin, 2018) and in many ways makes teachers persistent to use technology in their teaching activities (Ogurlu & Sevim 2017). Due to this reason, studies on teachers' beliefs are important to hold for the betterment of the ICT integration in education. In addition, access to technology for both teachers and students are also a strong concern for ICT integration (Brown & Green, 2015; Gemin, Pape, Vashaw, & Watson, 2015; MoEC, 2013). In minimizing the problems, many schools are considering, one-to-one technology for teachers and students (Brown & Green, 2015). In the level of policymakers, many kinds of technological establishment and projects are offered for education (Brown & Green, 2015; Gemin, et al., 2015), for example in Indonesia where the current national policy promotes and supports the development of ICT through national projects. The projects also include technical and vocational education and training (MoEC, 2013). Additionally, the Indonesian national curriculum center under MoEC in coordination with related ministries e.g. Ministry of Finance and Ministry of

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Higher Education, Research and Technology initiated a technology-based curriculum in 2013 (MoEC, 2013).

ICT represents the main theme which can support the way the educational systems work around the world to improve students' learning performance (Abdulrasool & Mishra, 2009; Alseddiqi, Mishra, & Abdulrasool, 2010; Kilinc et al., 2018; Peeraer & Van Petegem, 2011; Ramadan et al., 2018; Shamim & Raihan, 2016; Yang, 2014). For example, (Kilinc et al., 2018) explained that teachers will improve information if the environments of the classes have been established for integrating ICT. Factors leading to the success of ICT integration in education are technological infrastructure development, accessible equipment, institution vision, technical support, human resource skills and users' beliefs on ICT integration benefits (Tsai & Chai, 2012). In accordance with these benefits, Peeraer and Van Petegem (2011) informed that it is important to manage teachers and students' cutting-edge knowledge and information in order to upgrade the system of school management. In vocational schools, ICT could be used to activate teaching and learning, facilitate fun learning, save time, and promote student-centered learning when compared with traditional teaching (Ramadan et al., 2018; Shamim & Raihan, 2016; Yang, 2014). To achieve the benefits of the ICT integration, ICT should be infused to VTHS system, by engaging instructional activities in using a multi-disciplinary approach and combining various skill sets (Abdulrasool & Mishra, 2009; Alseddiqi, Mishra, & Abdulrasool, 2010). In other words, ICT integration could support teachers to provide students with instruction of complex skill when there are adequate beliefs towards the ICT and its integration in VTHS education.

Teachers' Skills and Beliefs of ICT and Its Integration

Teachers should have adequate skills in order to integrate ICT into their educational activities. Some studies showed that junior teachers consider themselves as the representation of digital natives or millennials who cannot be separated with the use of ICT on daily basis including in their learning activities (Aslan & Zhu, 2016; Bennett, Maton, & Kervin, 2008; Elstad & Christophersen, 2017; Habibi et al., 2018; Hatlevik, Scherer, & Christophersen, 2017; Valtonen al., 2015). As teachers teach millennial students, they are required to have knowledge and skills of ICT and its integration in classrooms; however, many students in high school levels believe that the activities are not appropriately carried out (Bennett et al., 2008). Besides, senior teachers have been also reported to have lack of skill for the Internet use in their instruction (Hatlevik et al., 2017). As other studies (Aslan & Zhu, 2016; Habibi, et al., 2018) reported that the teachers, junior and senior, need to collaborate to create meaningful teaching and learning activities which many teachers don't have the sufficient skills and knowledge. Alazam et al. (2012) informed that the skills of the teachers in their studies were low due to age, meaning that there was a positive relationship between teachers' ages and teachers' skills in respect to ICT. The similar findings also informed that teachers had low skills and ability in integrating ICT into their instructional activities due to the demographic background (Valtonen et al., 2015). There were few studies (Alazam, Bakar, Hamzah, & Asmiran, 2012; Khan, 2017; Lam & Hassan, 2018; Yang 2014) informing teachers' skills of ICT and its integration in VTHSs that demonstrated the significant affiliation between ICT use and teachers' skills. Besides knowledge and skills for ICT and ICT integration, beliefs also play important roles in the success of ICT integration including in VTHSs.

The importance of teachers' beliefs in the implementation of any educational initiative has been emphasized due to its function to determine activities in the classrooms (Tobin, Tippins, & Gallard, 1994). Teachers' beliefs were one of the key factors influencing ICT integration in education (Boyd, Lankford, Loeb, Rockoff, & Wyckoff, 2008; Elstad & Christophersen, 2017; Prasojo et al., 2018; Sadaf, Newby, & Ertmer, 2016; Tsai & Chai, 2012). When teachers have positive beliefs on the ICT and its integration in improving students' performance in the

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learning process, the success of ICT integration will be more guaranteed. However, if teachers have a low level of beliefs toward the use of ICT in instruction, it may fail the ICT implemented in a classroom (Prasojo et al., 2018). Li, Yamaguchi, and Takada (2018) informed that teacher's perceived benefits on the ICT integration are significantly affecting teachers' perceptions on ICT for student-centered education tool. Teacher beliefs were significant determinants on why teachers adopt ICT in the classroom as a positive effect of constructivist beliefs on the use of ICT in the classroom (Herman, Tondeur, van Braak & Valcke, 2008).

The Research

This research adapted Ajzen's (1985) Theory of Planned Behavior (TPB) as an academic framework to comprehend VTHS teachers' beliefs in relation to ICT and its integration in education. TPB is a widely used and validated theory to inform comprehensive descriptions required to understand people's intentions and actions to engage in a given behavior (Ajzen, 1991). The TPB is an extension of the Theory of Reasoned Action (TRA) introduced by Ajzen (1985) which assumes teachers' intention and action to integrate instructional technology in a decision based on personal and social factors. The personal factor, attitude toward the behavior, is defined as teachers' positive or negative personal beliefs regarding the use of technology. The social variable, subjective norms, are defined as teachers' perception of the significance of others' beliefs influencing their intentions and action using technology in instruction (Ajzen, 1985). In this research, three salient beliefs constitute the actions using ICT in the teaching and learning process; behavioral beliefs, normative beliefs, and control beliefs (see Figure 1). Each outcome was measured by teachers' personal evaluations of the effectiveness of ICT integration.
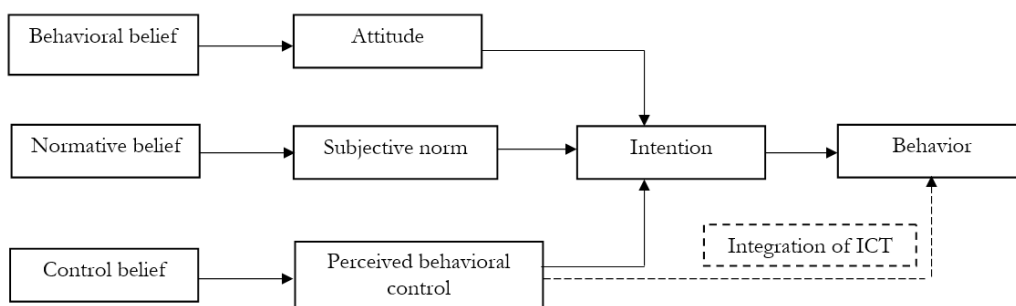

Figure 1. Theory of Planned Behavior (Ajzen, 1991).

Many studies have explored teachers' beliefs on intentions and actions related to different technologies in general term (Herman et al., 2008; Leem & Sung, 2018; Li, Yamaguchi, & Takada, 2018). However, studies related to the use of ICT in the context of VTHSs are still limited, even more limited in the context of developing countries like Indonesia. Therefore, this research was conducted to answer three research questions:

1. To what extent are VTHS teachers' beliefs on ICT and its integration?
2. Is there any significant difference of VTHS teachers' beliefs between demographic information: age, gender, and teaching experience?
3. How did VTHS teachers perceive beliefs in relation to the use of ICT?

Methodology of Research

General Background

This mix-method study with sequential explanatory design (Creswell, 2014) aimed to elaborate VTHS teachers' beliefs on ICT and its integration in education. Besides, the purpose of the research also informed the difference of the teachers' beliefs between demographic information namely genders, ages and teaching experiences. The research was conducted through two phases, quantitative (survey) and qualitative (interview). While the quantitative was the main data source, qualitative aimed to support it. The research that was supported by Indonesian ministry of education, provincial capital Jambi was conducted in 13 Indonesian VTHSs. It was funded by Indonesia endowment fund for education (*Lembaga Pengelola Dana Pendidikan, LPDP Indonesia*). The research took almost one year to complete from January to November 2018. As it is an educational technology research conducted in Indonesia as one of many developing countries, the research is expected to fill the gap among many educational technology researches in developed countries that have similar issues, ICT in vocational high school education.

Quantitative Phase

The survey questionnaires for this research were developed based on some previous studies (Sadaf et al., 2016; Valtonen et al., 2015). The validity of the instruments was examined through content validity involving seven experts of educational technology and face validity to see the respondents' understanding of the content of the instruments. The survey consisted of three main parts; behavioral belief, controlled belief, and normative belief (4-point Likert-scales form strongly disagree- strongly agree). In addition, demographic information questions were also included (see Table 1). The statements in the survey were adapted and developed to a more specific context in order to answer the research questions for example, "The use of ICT in education is integral to today's society" to "The use of computer and the Internet in education is integral in today's VTHSs". The final survey comprised of 20 questions. The overall average reliability of the survey was .87 where a reliability coefficient of .70 or higher is considered "acceptable" (Boyle, 1985; Cortina, 1993; Kline 1979). Online and printed questionnaires were utilized in this research. The data were saved into a computer. Being calculated and measured for the frequency, percentage, mean, and standard deviation (descriptive statistics), the data were then resented for the difference between demographic information using t-test (gender) and ANOVA (age and teaching experience).

Table 1. Questionnaire variable.

Categories	Descriptions	Numbers of items
Q1-Q3 (Demographic information)	Gender, age, and teaching experience	3
Q5–Q19 (Behavioral beliefs)	Outcomes of using ICT in VTHSs	7
Q19-Q28 (Normative beliefs)	People who expect the use of ICT in VTHSs	6
Q29–Q38 (Control beliefs)	Internal and external enablers/constraints	4

The questionnaire was distributed to 1051 VTHSs teachers. However, only 765 respondents completed the survey. Meanwhile, 65 respondents did not return the survey and 221 questionnaires were not fully completed and cannot be measured. From 765 respondents,

278 respondents were males (36.34 %) while 487 were females (63.66%). In addition, 234 respondents (30.59%) were 25-40 years old, 298 respondents (38.95%) were 41-55 years old, and 233 respondents (30.46%) were >55 years old. The respondents' teaching experiences varied; 1-15 years (241 respondents or 31.50%), 15-30 years (314 respondents or 41.05%), and >30 years (210 respondents or 27.45%).

Qualitative Phase

To support the quantitative findings, semi-structured interviews were conducted. A semi-structured interview was used to elaborate on how interventions work and how they are improved making easy the interviewers to discuss topics that might not be reached through a survey (Creswell, 2014). The interview questions were established in line with the analysis results of the survey data. This procedure was one of the essential characteristics of sequential explanatory; the collection and analysis of qualitative data should be referred to the analysis of quantitative data.

The confirmation with the survey respondents' agreement to participate in the interview sessions was obtained. Seventy-six informants agreed to get involved; however, ten informants were chosen from different demographic backgrounds (gender, age, and teaching experience). All informants' original names in the interview were masked; only information about gender, age, and teaching experience was revealed (see Table 2). There are ten informants involved in the qualitative phase. There are 6 females and 4 males whose age is from 29 years old to 53 years old. Their teaching experience varied from 5 years to 32 years.

Table 2. Informants in the interview.

Names (pseudonyms)	Gender	Age (years)	Teaching experience (years)
Elli	F	29	5
Andy	M	39	15
Susan	F	28	3
Jenny	F	44	20
Katherine	F	35	11
Cloe	F	50	25
Terry	M	37	14
Erick	M	45	22
Tony	M	47	25
Sally	F	53	28

The interviews were done in Bahasa Indonesia, the informants' native language, which aimed to gain in-depth information about the research aims. Using a native language in an interview of qualitative research is considered the best way to gain information because social influence experienced by someone is unique through his/her native language (Chapman, 2006) in order to gain natural fluency and deliver in-depth information. Each interview took between 70 minutes to 80 minutes to complete recorded with smartphones. The recordings were

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transcribed through Google doc transcriber. The data were coded and compared for thematic analysis. The process was conducted for all informants, one by one from the first informant to the last informant. Coding and translation followed the process of the data transcription. Data collection and analysis in qualitative inquiry is not a parallel activity rather than a concurrent process since the two have mutual influences (Creswell, 2014).

For the data trustworthiness (Creswell, 2014), member checking and reflective commentary were done. The transcribed data were returned to all ten informants for a thorough read for evaluation; each informant was allowed to address feedback and confirmation as well as agreement on the transcribed data. Together, all researchers discussed the findings in two sessions of discussion aiming for comment reflection. All informants' names and other personal identities were masked for the data elaboration as part of ethical clearance in this research, protecting informants' interests and rights. However, the information about informants' genders, ages, and teaching experiences were revealed for readers to understand deeply about the difference among research variables.

Result of Research

VTHS Teachers' Beliefs on ICT and its Integration

Description of this study has an indication that the respondents had high-level positive mean for behavioral beliefs (M = 4.21; SD = 0.85). The highest mean (4.51) gained from "ICT is relevant with the 21ˢᵗ century teaching in VTHSs" which is followed by "ICT provides possibilities for enhancing the quality of learning" with (M= 4.31; SD= 0.86). The lowest M= 3.87 of this behavioral belief was "ICT improves students' performance". In addition, the statements "ICT Enriches learning experience through innovative tools" and "ICT Helps facilitate understanding of material/concepts" were agreed by the respondents (M= 4.21; SD= 0.85). "ICT improves engagement with content and students" was agreed by most participants with (M= 4.23; SD= 0.87). The coefficient alpha or Cronbach alpha for behavioral beliefs is .87 (see Table 3).

On the other hand, respondents had their lowest mean for control beliefs (M=3.08; SD= 1.02). The statement "I have high self-efficacy in personal use in teaching using ICT" has mean of 3.15 (SD= 0.95) following the highest-mean statement "Access to learning outside the classroom supports the ICT use in VTHSs" (M=3.17; SD=1.08). "Supporting human resources is not an issue" gain the lowest (M=2.98; SD 1.02). "Restricted access to computers and the Internet is not a problem in ICT integration" was not approved by the respondents with M= 3.00. The control beliefs' Cronbach alpha is .88. For normative beliefs, the average mean was 3.46 (SD= 0.96). Most respondents believed that ICT use in VTHSs was school administrators' expectation (M=3.73; SD= 0.97). Meanwhile, they did not agree that the authorities fully supported the use of ICT in VTHSs (M=3.17; SD= 1.01). Further, statement "Students' good influence determines the quality of ICT integration" gains mean of 3.65 with SD= 0.97. "All related parties motivate the use of ICT in education" was agreed by some respondents (M=3.30; SD= 0.93). The statement, "Parents support the use of ICT in VTHSs" gains mean of 3.36 with SD= 0.96. The Cronbach alpha (α) is 0.86.

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Table 3. Beliefs on ICT.

No		Mean	Standard deviation	Cronbach Alpha
	Behavioral beliefs	4.21	.85	0.87
1	ICT provides possibilities for enhancing the quality of learning	4.31	.86	
2	ICT improves engagement with content and students	4.23	.87	
3	ICT is relevant with the 21st century teaching in VTHSs	4.51	.85	
4	ICT enriches learning experience through innovative tools	4.21	.84	
5	ICT helps facilitate understanding of material/concepts	4.21	.85	
6	ICT caters to the needs of different learning styles	4.12	.86	
7	ICT improves students' performance	3.87	.84	
	Normative belief	3.46	.96	0.86
1	Students' good influence determines the quality of ICT integration	3.65	.97	
2	ICT use in VTHSs is administrator's expectation	3.73	.97	
3	Authorities support the use of ICT	3.17	1.01	
4	Colleagues use ICT for teaching and learning improvement	3.55	.95	
5	Parents supports the use of ICT in VTHSs	3.36	.94	
6	All related parties motivate the use of ICT in education	3.30	.93	
	Control beliefs	3.08	1.02	0.88
1	I have high self-efficacy in personal use in teaching using ICT	3.15	.95	
2	Access to learning outside the classroom supports the ICT use in VTHSs	3.17	1.08	
3	Restricted access to computers and the Internet is not a problem in ICT integration	3.00	1.03	
4	Supporting human resources is not an issue	2.98	1.02	

VTHS Teachers' Beliefs Difference between Demographic Information

The research also informed whether the male and female teachers differed in their beliefs to ICT and its integration in VTHSs (see Table 4). The findings of the t-test noted that there is no significant difference between male and female teachers concerning their beliefs; behavioral (p.220), normative (p=.321) and control (p=167) at $p<.005$ on ICT and its integration in education.

Table 4. t-test results for difference between genders.

Demographic Information	Behavioral	Normative	Control
Gender			
Female	4.21	3.57	3.11
Male	4.25	3.52	3.12
p	0.220	0.321	0.167

In addition, the findings of a one-way ANOVA of the teachers from various ages, regarding beliefs on ICT and its integration in education, have an indication that there is significant difference among the informants' ages for behavioral belief (p=0.04) where average means are 4.46 (25-40), 3.89 (41-55), and 3.51 (>55). However, there are no differences for normative and control beliefs. From teaching experiences, there is also significant difference for behavioral beliefs (p= 0.02 at p<.005). Meanwhile, no significant differences for normative and control beliefs were found in this research (see Table 5)

Table 5. ANOVA results for difference among ages and teaching experience.

Demographic Information	Behavioral	Normative	Control
Age			
25-40	4.46	3.56	3.10
41-55	3.89	3.42	3.07
>55	3.51	3.43	2.03
ρ.	0.04*	0.163	0.152
Teaching experience			
1-15	4.48	3. 48	3.09
16-30	3.99	3.47	3.10
>30	3.50	3.33	3.02
ρ.	0.03*	0.186	0.138

*significant difference at the level .05

VTHS Teachers Perceived Beliefs in Relation to the Use of ICT

The analysis of the qualitative phase revealed perceived beliefs of the informants in the interview set into three categories of beliefs; behavioral, normative and control beliefs. Six sub-themes emerged from these three thematic categories in order to support the findings of the survey (see Figure 2).
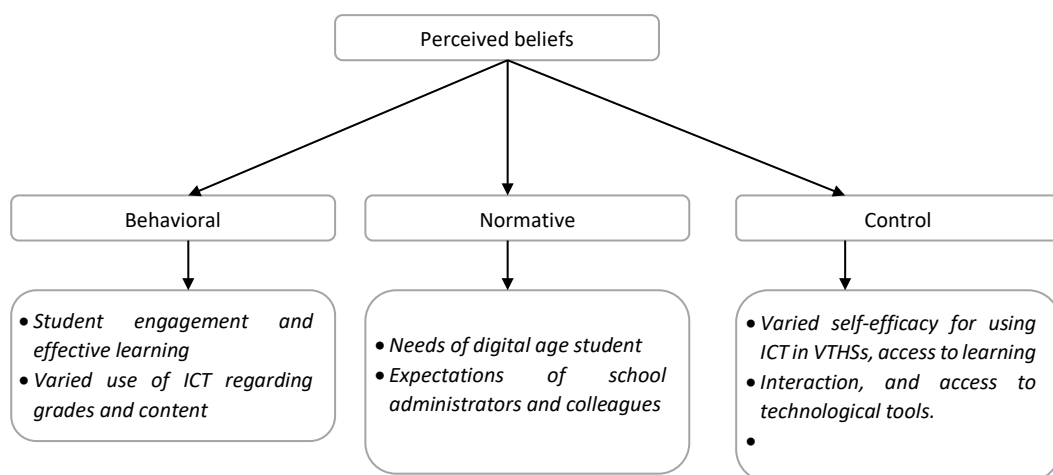

Figure 2. Themes and sub-themes of the qualitative findings.

Student Engagement and Effective Learning

The interview revealed that improvement of students' learning was the most frequently cited reason to use ICT in VTHSs classrooms. All ten informants informed that they used ICT in their teaching due to its benefits on student engagement and student learning. They revealed that the use of ICT tools plays an important role in establishing communication and getting students to be more actively involved through variation of learning experiences. It is also informed that students did activities outside the classroom when given assignment using the Internet or extended learning time. One of the informants informed,

> "I think that ICT is a great way to improve students learning and engagement. The Internet and smartphones could enhance the way students to communicate make students more interacting to peers and teachers. I also think that with the digital age, a computer can simulate various activities in VTHSs. It is a way to improve every aspect of instruction in the 21st-century education" (Terry)

VTHSs teachers also noted that ICT are good tools to help explain concepts of VTHSs course contents to gain the fulfillment of various styles of learning possessed by VTHSs students, especially video and audio features. For example, one of the informants (Susan) stated in the interview that the feature on the Internet such as Youtube could explain clearer and more understandable for students to learn various courses since it provides millions of useful videos for VTHSs students. Another teacher revealed a similar idea,

> I would use a computer and its features including the Internet because it facilitates various ways for students to learn. Many students are audiovisual learners; they can use Video channels like Youtube and Facebook video sharing in the school computer to learn about technics, automobile, motorcycles and so on". (Tony)

In addition, seven of the 10 VTHSs teachers stated that the use of technologies encourages students to enhance their experiences in learning through related innovative technology tools. One of the informants expressed his opinion,

> "Technologies keep students' interests improved and have them focused on the course you are teaching. Utilizing them can help transform how a lesson delivered to be more fun and interesting because students in this era are used to the computers, smartphones and the Internet. Relate the technologies into learning activities rather than pen, books, and paper". (Katherine)

Most of the VTHSs teachers' perceptions of the usefulness of ICT included improving student learning. They perceived that the use of ICT in classrooms is a great way to facilitate motivation for students by enriching their learning experiences through innovative relevant tools and promote comprehension of content through varieties of tools.

Varied Use of ICT Regarding Grades and Content

Many informants perceived that the benefits of ICT in VTHSs are dependent on the content of the courses being taught as well as the grade levels. The usefulness can be different between courses and content. One of the informants, Susan who is an English teacher stated that she used social media such as Facebook and Twitter teaching the students to improve students' writing and reading. Another informant who is a teacher of Motorbike machine informed,

"I used video simulation in teaching my students; the videos I got from Youtube. The visual is really beneficial for my course. Students can easily get the information about the lessons being taught in the courses" (Tony)

Besides the courses and content, grade levels are also informed as factors that can determine the success of ICT integration in VTHSs schools as perceived by these two teachers,

"Technologies help differently with some grade levels. For senior students, I used video simulation. However, for junior students, I just used my computers and projector as supporting tools to explain basic lesson", (Elli)

"VTHSs students are technology savvy. They have much experience with ICT and live on smartphones, the Internet, and computers. However, grade levels differ for the use of ICT in classrooms. For the senior one, more specific use of technology may be applied in accordance with their field training". (Jenny)

Although VTHSs teachers understood the benefits of ICT use in instruction, their intended integration differed depending on the content areas and grade levels.

Needs of Digital Age Student

During the interviews, the influence exerted by VTHSs students emerged as an important consideration among the teachers when describing their technology integration into their instruction. All teachers opined that their students would influence their ICT integration during teaching and learning processes. Two of the informants had their saying,

"If students are telling me that they want more integration of ICT such as the Internet and smartphones, I always try to integrate ICT in order to keep the students engaged even though I am not good at technology," (Andy)

"Students in VTHSs are now accustomed to using technology and it influences the way teachers use it into teaching." (Katherine)

In addition, most teachers considered that using ICT enabled them to have a more closed connection to the students.

"That's what students are used to, you know, it's more comfortable for them to use those technologies [ICT]. Should teachers use ICT, they will be more connected to their students". (Erick)

Teachers believed that ICT is relevant to millennial students because they use smartphones, computer, and the Internet for daily basis. One informant added that she felt connected when using ICT. If people could not see ICT's development all around, they should be blind or living in their own life.

Expectations of Authorities, Administrators, and Colleagues

In addition to students needs of technology, VTHSs teachers revealed that the use of ICT in their instruction was influenced by the expectation of many parties; authorities, administrators, and other teachers. Eight of the ten informants believed that educational authorities and school administrators would have their expectation towards the use of ICT to be carried out. One informant informed,

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"I think that my school administrators and related educational authorities are issuing a policy to push us including senior teachers like me to use ICT into teaching." (Sally)

In addition to the expectation of school administrators and related educational authorities, peers' influence was also perceived as a factor affecting the use of ICT into instruction. As one of the teachers stated in her interview that If her school required her to use technology in her classroom, she would try hard to incorporate it more than she would intend to, as well as if her peers or co-workers gave a good example on how to use ICT into teaching.

Varied Self-efficacy for Using ICT in VTHSs

The interview data revealed that all young teachers felt comfortable using ICT in VTHSs classrooms. For example, one of the informants (Andi, 39) stated that, in general, ICT tools in most of their functions were easy to use and integrate into his classroom. In addition, another young female teacher (Elli) had her opinion,

"I supposed that I do have the skills to use ICT for my students. I can use smartphone applications, social media, video applications, computers, and other ICT forms. However, if I am given a chance to attend workshops, I'd like to register."

However, some others especially the senior ones informed their low self-efficacy due to the lack of experience and skills in teaching through ICT integration. Two of the teachers stated,

"I am a senior teacher with lack experience and skills in using ICT. I still encounter technical holdbacks like operating computers. We do realize the importance of ICT in the 21st century but we have weaknesses in this system and tool," (Sally)

"I am too old to use technology in my teaching. I just cannot do it." (Cloe)

A pessimistic statement by the two teachers explains that ICT use in a classroom might be very hard to do for teachers with no experience and ICT skills even though most of them recognized ICT benefits in instruction.

Access to Learning

Interview data revealed that some VTHSs teachers perceived ICT especially the Internet is very useful due to easy and quick access inside as well as outside the classroom. Many informants believed that ICT use would provide more access, opportunities, and resources for students in VTHSs to develop learning inside or outside classrooms. One of the salient quotes revealed by Tony,

"I am not good in ICT. However, I could say that ICT allows students for knowledge, information, and lesson access anywhere and anytime, inside or outside classrooms, for example, if I want them to search information about car machine spare parts on the Internet, the information is very complete and available."

Moreover, VTHSs teachers believed that because of the accessibility of ICT especially smartphones and the Internet, students will have information to broaden their knowledge and gain interaction through idea sharing,

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"ICT especially the Internet can help students with interaction outside the classroom to look for information in relation to the course assignment. It eases communication and interaction between VTHSs students as well as teachers and students," (Jenny)

Generally, the teachers were motivated to use ICT in their VTHSs classrooms due to its potentiality in increasing interaction, information, and resources for students learning.

Access to ICT and Human Resource Support

Even though it was perceived that ICT broadened the access to learning. Some of the teachers in the interview were concerned about the access to ICT and technician support from the authorities or school administrator. The problems regarding the access to ICT and human resource support having emerged from the interview such as connection error, broken tools, and software update should be overcome by facilitating access to ICT and human resource support. Six of the ten informants had almost similar opinions in this matter, as one of them informed,

"I think the most important thing to be considered in the use of ICT in VTHSs is the facility and human resource support. Well-maintained facilities will be supporting the success of teaching and learning process through the use of ICT," (Terry)

In addition, students' budget for ICT use outside classrooms was also revealed in the interview. Erick said that he was concerned about the ability of the students to buy tools and access. One of the interviewees said that not all students had smartphones and the Internet access, it is too much if in every class we use ICT. They perceived that not possessing a computer, a smartphone, as well as the Internet access at home, might impede their use of ICT in VTHSs.

Discussion

The aim of this research was to elaborate VTHS teachers' beliefs on ICT and its integration in education and difference of the teachers' beliefs between demographic information (gender, age, and teaching experience). A total of 765 VTHSs teachers participated in the survey. There were 278 (36.34%) males and 487 (63.66%) females. From the quantitative data analysis, the description of the research indicated that the respondents had a high level of the positive mean for behavioral beliefs (M= 4.21). On the other hand, respondents had their lowest mean for control beliefs (M=3.08). For normative beliefs, the average mean is 3.46 which is lower than behavioral beliefs but higher than control beliefs. The findings noted that even though the teachers have low scores of perceptions of control beliefs (internal and external enablers), the behavioral beliefs (perceptions on the outcomes of using ICTs in VTHSs) are high. The findings are in sync with previous related surveys which were conducted where behavioral beliefs perceived gained the highest scores of means (Aslan & Zhu, 2016; Sadaf et al., 2016)

The quantitative results also inform that there is no significant difference between male and female teachers concerning their beliefs; behavioral, normative, and control. However, the findings of a one-way ANOVA of the teachers of various ages and teaching experience, regarding "beliefs on ICT", have an indication that there are significant differences among. This research reported that the younger teachers and less experienced teachers were reported to have higher scores of beliefs on ICT and its integration which agreed what has been reported in some studies (Alazam et al., 2012; Bennett et al., 2008; Elstad & Christophersen, 2017; McNamara & O'Hara, 2008). Therefore, younger teachers with less experience in teaching were more associative with ICT use in VTHSs. These findings may be a reason why there

should be more programs for ICT integration especially for senior teachers whose beliefs on ICT and its integration are lower than the young teachers of VTHSs.

In line with the quantitative results, the teachers also revealed in the interview through qualitative data elaboration that the improvement of students' learning was the main reason for ICT integration in VTHSs which is in accordance with the study by Herman et al. (2008). Further, benefits on student engagement and student learning, establishing communication and getting students more actively involved with variation of learning, and engaging activities outside the classroom as well as extended learning time are also informed in the qualitative findings which are related to behavioral beliefs for ICT use in VTHSs (Leem & Sung, 2018; Li, Yamaguchi & Takada, 2018). Qualitative data results also revealed that VTHS teachers believed that their students, administrators, and colleagues were the people who will most likely influence their normative beliefs. However, the teachers were relatively more motivated to address their students' expectations regarding the use of ICT, compared to the expectations of their administrators and colleagues.

In addition to behavioral and normative beliefs, the findings of qualitative data also supported the quantitative findings in terms of control beliefs, Internal and external enablers/constraints; Varied self-efficacy for using ICT in VTHSs (junior teachers reported their high self-efficacy while senior teachers reported differently), access to learning (most teachers informed easy access of the Internet inside and outside the classrooms facilitates students' learning) and access to ICT and human resource support (some teachers concern about the access to ICT and technical support from the authorities or school administrator. The results on the self-efficacy and access to learning are in line with the previous study by Khan and Markauskaite (2017) where the two factors established the use of ICT in vocational schools. Problems from the interview were revealed such as connection error, broken tools, and software update should be overcome by facilitating access to ICT and human resource support as also suggested from other previous research findings (Chen & Hudson, 2018; Khan & Markauskaite, 2016). There have been many researches reporting beliefs toward ICT and its integration in education (Herman et al., 2008; Leem & Sung, 2018; Li, Yamaguchi & Takada, 2018). However, little have been conducted in the context of vocational education. Therefore, this research adds the literature, teachers' beliefs of ICT integration in vocational schools of a developing country, by reporting the beliefs through mix method study, survey and interview.

Conclusions and Implications

The results indicate that VTHSs teachers' beliefs toward ICT and its integration were high in terms of behavioral belief while they were low for control beliefs. In addition, for normative beliefs, the average score of the means was medium. The quantitative findings were also supported by the qualitative findings; behavioral beliefs (varied self-efficacy for using ICT in VTHSs, access to learning and interaction, and access to technological tools), normative beliefs (needs of digital age students and expectations of school administrators and colleagues), and control beliefs (varied self-efficacy for using ICT in VTHSs, access to learning and interaction, and access to technological tools).

The results of the research are significant to be a reference for developing countries' educational regulators to issue policies for a betterment of technology integration, suggest that VTHSS should promote these beliefs to better the integration for ICT in vocational schools. VTHSs should target the teachers' beliefs toward the value of ICT for improving student learning and engagement. It is critical that VTHSs focus their efforts on aiding the teachers to learn strategies to integrate ICT in line with their grade level interests and specific subject areas. Providing the teachers more opportunities to reflect on the pedagogical uses and implications of ICT and its integration can result on a positive effect towards their action to use these same tools

in the classroom. Success in this regard may need the implementation of several progressive steps such as to facilitate schools with better ICT equipment and provide human resources on technological maintenance as well as hold technological seminars and workshops. VTHSs further should consider seeking collaborative projects in improving ICT integration in VTHSs and providing relevant feedback on how the technology actually works in a VTHSs classroom and how it can meet the needs of students. Providing the teachers' opportunities to utilize their own technology should be facilitated by the authorities. Further research is suggested to focus on specific interventions that align with VTHSs teachers' behavioral, normative, and control beliefs that may help VTHSs develop a model and better preparation for their ICT integration into teaching.

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