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Submission date: 17-Jan-2023 12:01AM (UTC+0700)
Submission ID: 1993651010
File name: Lousia_JESTP_Submit_Final.pdf (302.82K)
Word count: 11652
Character count: 66950

EDUCATIONAL SCIENCES: THEORY & PRACTICE eISSN: 2148-7561, ISSN: 2630-5984

Received: 28 January 2022
Revision received: 29 March 2022
Accepted: 30 June 2022

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www.jestp.com

DOI 10.12738/jestp.2022.2.0007 ♦ **June** 2022 ♦ 22(2) ♦ 87-103

Article

A Model Of Ict-Based Educational Information System To Improve The High Schools Vocational Culinary Art Skills in Indonesia

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Abstract

Information and communication technology (ICT) is a fundamental necessity in vocational high school education. Vocational culinary art skills procedure is not only a means of keeping up with technology developments but also includes proper application in the instruction process. In actuality, several obstacles inhibited the utilization of ICT to administer school-based learning and instruction. When teachers can use ICT as a source of academic information to improve the quality of student learning, ICT will unquestionably be valid. Therefore, this study aims to examine a model for the evaluation of ICT-based information systems (IS) in enhancing culinary arts skills in Indonesian vocational high schools. After completing the pre-development and development phases, it was determined that the ICT-based IS operational and suitable for use by teachers. The data was collected from 19 technical high school teachers. We used both random and systematic sampling techniques. These data were compiled using interview guides and a poll of teachers. Seventy-five percent of teachers at vocational high schools were found to be proficient in the use of ICT in the classroom. Still, the results also indicated that Vocational teachers lacked the essential training and resources to integrate ICT into their classrooms effectively. These findings contributed to the body of knowledge and might be regarded as a pioneering study in the specific field of vocational culinary art skills.

Keywords

Model, ICT, Vocational, Cullinary, Indonesia

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Citation: Kandoli, L., N. (2022). A Model Of Ict-Based Educational Information System To Improve The High Schools Vocational Culinary Art Skills in Indonesia. *Educational Sciences: Theory and Practice, 22*(2), 87 - 103.

http://dx.doi.org/10.12738/jestp.2022.2.0007

Implementing information and communication technology (ICT) in educational settings appears to have the potential to improve teaching and learning performance, the research productivity of instructors and students, and the management and efficiency of educational institutions (Akrim & Dalle, 2021). Therefore, ICTs have significance for training vocational art skills. ICT in education is viewed as a component of the more significant objective of enhancing education globally and making it accessible to all. ICT is a broad term that includes numerous technologies and resources for transferring information and creating, distributing, storing, and managing it (Council, 2000). Information technology (IT) provides computing, the internet, broadcasting, radio, and the telephone, all of which can be used to retrieve, store, transmit and modify user data (Ogalo et al., 2022). ICT in education improves teaching and learning, student productivity, and the administration and effectiveness of organizations (WangareWaruingi et al., 2021; Zulkarnain & Dalle, 2021). According to Lankshear and Knobel (2006) and de Winter et al. (2010), ICT has enabled faster and more efficient manufacturing procedures and given students new learning tools. However, research reveals that ICT use, particularly among instructors, is still minimal (Nascimbeni, 2017); therefore, it is essential to comprehend why ICT has been used and not employed. This study was critical since previous research reveals that students can be more effective participants in their education when ICT is utilized (Gao & Hargis, 2010; Kuppusamy et al., 2008). The use of information and communication technology (ICT) in education has several benefits, including developing problem-solving skills, promoting collaborative learning, providing flexible learning options, and enhancing productivity (Bitter & Legacy, 2008). In addition, ICT is considered indispensable for evaluating the efficacy of school-based instruction and student learning (Lin et al., 2012). As a result of its potential, ICT has become an integral part of efforts to improve education.

The implementation of ICT in education is a significant priority for several nations. Since the late 1990s and early 2000s, numerous governments have created long-term strategies to increase educational ICT spending budgets. In 2011, the Organization for Economic Co-operation and Development (OECD) reported that several governments were making considerable expenditures on information and communications technology (ICT). In 2008, the Australian government estimated that approximately $8 billion was invested in ICT in education (Lane et al., 2014). In 2006, the US Department of Education reportedly spent over $9.6 billion on instructional technologies for public schools (Albugami & Ahmed, 2015). The United Kingdom invests similarly in educational technology as the United States and Australia. Becta (2009) estimated that ICT investment in the United Kingdom totaled £880 million between 2008 and 2009. Many European nations have begun to recognize the importance and benefits of ICT. In various school subjects during the past decade, ICT has been integrated into the instructional process (Balcon, 2003). In Saudi Arabia, the use of computers and digital technologies in academic environments has also been acknowledged (Almuqayteeb, 2009). King Abdullah of Saudi Arabia began reforming the Saudi educational system in 2007.

Previous discourse demonstrates that the significance of ICT in enhancing classroom results is widely recognized (Amka & Dalle, 2022; Lin et al., 2012). As a consequence, the use of ICT in education has extended globally as a vital component of educational reform. Educators and researchers remain concerned about instructors' use of ICTs for teaching and learning, despite the increasing use of ICT in schools and the fact that kids are growing up with ICT (Jimoyiannis & Komis, 2006; Polly et al., 2010). Numerous studies have demonstrated that many educators are not adopting ICTs effectively in the classroom (Wozney et al., 2006). Cil and Cepni (2012) acknowledge that the education sector has not reached the expected goals of ICTs integration in schools despite significant contributions and enormous economic investments to integrate ICTs. Most school-based ICT programs fail or stall before completion, failing to meet their stated objectives (Njagi & Oboko, 2013).

In contrast to this tendency, the competency-based curriculum introduced in Indonesia in 2016 places ICTs at the center of the instructional delivery process. Therefore, Indonesia's efforts to achieve its ICT strategic plan by 2030 and its vision for 2030 will be compromised unless this tendency is substantially reversed. Similarly, research indicates that instructors are more receptive to adopting new technology when they perceive that such resources will assist them in achieving their educational objectives in the classroom (Zhao & Frank, 2003). Furthermore, instructors' ideas and understanding of the value of technology are deemed crucial for its implementation in the school (Ertmer, 2005).

Prior discussion demonstrates that ICT is an essential indicator for the education process, but previous research on ICT in teaching has primarily focused on critical ICT as a curriculum subject rather than a teaching tool; for example, Wanjala (2016) examined the incorporation of ICT within Mathematics. According to Manyasi

(2012)'s research, the focus was on teachers' understanding of the teaching of reading for national values; ICT integration was not examined. Less research has studied teachers' knowledge of implementing ICT in education, particularly in Indonesia. Existing studies on teacher understanding of ICT integration in teaching and learning have focused more on technology use outside the classroom (Suwannasom, 2010) and have either quantitative or qualitative approaches, focusing only on the outcome and others on factors influencing ICT integration (Underwood & Dillon, 2011). Moreover, earlier research concentrated primarily on developed economies but paid little attention to developing economies such as Indonesia, which is also a developing nation (Fahm et al., 2022). Because addressing the issue of education quality is an urgent matter that cannot be postponed, there is a need for time to conduct research in Indonesia, particularly on the improvement of vocational programs for high school culinary arts, as the demand to do so is an issue that cannot be postponed.

In comparison to other nations, vocational high school enrollment in Indonesia, particularly in culinary arts programs, is still relatively low (Fiandra et al., 2022). An absence of an academic management system that serves as a repository for all academic problem-solving data is a contributing factor. To enhance the quality of education, particularly vocational education of culinary skill training programs, it is essential to construct or develop a model that leverages IT-based academic information to improve the quality of vocational education in Indonesia. This study aims to examine the model for the evaluation of ICT-based academic information systems to enhance the vocational high school culinary arts program in Indonesia.

Introduction, literature review, data analysis, findings, and conclusions constituted the five aspects of the study.

Literature Review

As there is no such thing as a vacuum of knowledge, the researcher examined various sources. The objective would be to zero in on more specific research topics, demonstrate expertise with existing research, and draw linkages to more prominent themes. Here is an analysis of the literature that served as the basis for this inquiry. Both empirical and pertinent literature is examined in this chapter. This study examines the perceptions and attitudes of vocational art educators in Kenya towards using technology to enhance their classroom instruction. Review articles, books, journals, research papers, thesis reports, case reports, and web-based publications are literature sources. Does technology impact pedagogy, or does pedagogy influence technology? According to the available evidence, there is a direct correlation between the use of information and communication technology in teacher education and the mental growth of teachers. According to Belland (2009), teachers' judgments of the utility of ICT in the classroom may be influenced by their limited exposure to such tools during their schooling.

Belland (2009), Ertmer and Ottenbreit-Leftwich (2010), myself included, would much benefit from exposure to and work with existing classroom technology. Therefore, to integrate technology more effectively in the future, they must "experience" instruction using the information in real-world situations. Pre-service Without acknowledging teachers' prior cognitions, technology integration is limited because teachers' cognitions serve as a filter through which they receive actual teacher education experiences (Tondeur et al., 2008). While we accept that learning occurs when previously acquired knowledge is linked with new experiences, teacher educators must then face and critique old beliefs and experiences (Borg, 2009). Scholars have found that teachers recognize the significance of technology as a resource rather than relying on technology alone to produce pedagogical breakthroughs (Ruiz Franco & Abella García, 2011). According to McMahon and Bruce (2002), "Unfortunately, new technologies are not a cure for education's issues; at most, they facilitate rather than drive change." "It is ironic that research revealing mighty computers might finally return us to the concept that teachers can affect change" (p. 17). This concept is validated by studies from numerous educational institutions throughout the world. This understanding of ICT says teachers should employ it according to their beliefs and values rather than a predetermined approach. Niederhauser and Stoddart (2001) conducted a study in the United States to examine the relationship between teachers' theories and their usage of digital technologies in the classroom. Researchers reached this result after observing how instructors employed digital resources to implement their personal, educational viewpoints, which materialized in various pedagogical positions.

Similarly, research conducted in a Greek secondary school indicated that teachers utilized electronic resources in their courses to supplement traditional ways of teaching that emphasized the teacher's role and a test-driven curriculum (Doukakis et al., 2021). Similar research was conducted by Li (2014) on two technology-based

secondary EFL classes in China. According to their study, innovations had no noticeable effect on the relationship between teaching and learning. In conventional contexts, teachers remained the primary source of interaction. As a result of ICT's application to supplement centuries-old teaching practices, classrooms' physical appearances were only transformed. Researchers highlighted the need to address teachers' educational attitudes as a prerequisite for successful technology integration. Lance (2012) also highlighted the significance of instructors' perspectives in integration. In her survey of Canadian ELL instructors, she discovered that those who were hesitant to adopt new approaches did so not out of a fear of technology but because they were concerned about their students' capacity to understand the content and were not convinced of its pedagogical utility. Gobbo and Girardi (2001) concluded that, despite the majority of instructors having positive attitudes about ICT, they were unwilling to modify existing traditional teaching practices based on surveys that included the use of technology in Italian schools.

Contrary to popular belief, researchers found no evidence that teachers' educational approaches changed due to the introduction of technology. It is commonly accepted that effective digitalization requires an understanding of the nature of teachers in technology-mediated situations. It has been demonstrated that teachers that embrace a learner-centered, constructivist pedagogy and use technology to enhance their courses have the highest success with this method (Judson, 2006). Structuring pedagogy has significant implications for how technologies may continue to enhance the learning experience, raise students' motivation to learn, and facilitate thinking and knowledge production. Therefore, technology was used to facilitate students' exploration of knowledge and information generation rather than knowledge transfer; students learn 'with' rather than 'through.' ' However, it is less specific if instructors of quicker development will acquire modernist attitudes. Educators that adopt a constructivist approach to computer use do so based on their skills, not the instrument's characteristics.

Thirty-two teachers' opinions on education were polled (Judson, 2006). The "Focus on Integrated Technology: Classroom Observation Measurement" (FIT: COM), which analyzes the conformance of technology-integrated lessons to constructivist principles, was also employed to conduct direct observations of the teachers and provide ratings. According to the data, there was no association between the conduct of teachers in the classroom and their professed principles. Most educators in the survey agreed with constructivist views entirely, yet their classroom practices did not reflect this. Tondeur et al. (2008) investigated how primary school teachers utilize computers in the classroom based on their educational ideas. The results indicated a correlation between educators' worldviews and their use of technology in the classroom. Researchers found that traditional instructors are likelier to use computers for drill-and-practice tasks. In contrast, constructivist educators are more likely to give students greater freedom when utilizing computers for research and processing. This indicates that educators would utilize technology in education in a standard or innovative manner. Numerous studies have indicated that educators who embrace technology in the classroom do so because they have preconceived assumptions about using it that align with their pedagogical principles (Sugar et al., 2004). Teachers' perspectives on education determine their actions and how they employ educational technologies such as computers (Hermans et al., 2008). For their study, Cope and Ward (2002) conducted interviews with educators from several high schools to obtain their perspectives on technology usage in the classroom. The significance of instructors' attitudes on the integration of learning technology was studied using a phenomenological study technique. Teachers' attitudes toward technology play a crucial role in determining whether pupils adopt deep learning practices that emphasize creating connections between seemingly unrelated subjects. Students are more likely to engage in technology-based learning tasks that contribute to their long-term success when educators prioritize learning objectives, support and guidance, the appropriate time to acquire new technologies, ample materials, and the prudent implementation of these technologies. Teachers can assist students in developing good technical practices by organizing language classes that include technology in ways that are tailored to each student's prior knowledge, interests, and course objectives. According to Felix (2003), "best practice" is "the use of the most suitable tools to their greatest potential to generate solid educational processes and outcomes." Relevant to the curriculum, teachers must ensure that pupils are actively engaged in learning through the use of technology. Kerr (1991) demonstrates that teachers' ordinary classroom experiences are essential for identifying how to best integrate technology into instruction (p.259-260). Attia (2011) contends that instructors' everyday classroom experiences are essential to comprehend the function of technology in education. Teachers' conceptual proficiency Using technology to enhance classroom teaching and student development by expanding students' access to language-learning resources and facilitating meaningful connections between students' interests and classroom activities is arguably the most important factor in ensuring that language classrooms realize

technology's benefits. Every aspect of modern society today strongly depends on information and communication technologies (ICT). Due to the rapid development of ICT, several organizations have made substantial progress (Zhang & Aikman, 2007). The implementation of ICT has also had a significant impact on the educational system. In the early 1980s, when computers were first introduced into classrooms, teachers soon recognized their potential. For future generations, research indicates that ICT will keep its prominent role in educational settings (Sutherland, 2004). Technological innovations offer many learning-supporting opportunities (Lefebvre et al., 2006). In the second part of the 1990s, broadband connections to schools and colleges became ubiquitous in wealthier nations, although computers initially emerged in classrooms in these nations in the early 1980s. This was regulated mostly in developing nations. The United States of America has the highest investments in ICT and the largest budget for the use of technology in schools. The US Department of Education has committed up to $1 billion to implementing technology in public schools. Numerous governments across the globe have begun to sponsor ICT programs to improve school learning. In 2008-2009, the United Kingdom spent £2.5 billion on educational information and communication technologies (2010). In 2009, K-12 and postsecondary education expenditures in the United States totaled $6 billion and $4.7 billion, respectively (Nut, 2010).

New Zealand spends over $ 410 million annually on school information and communication technology (ICT). Johnson et al. (2009). Despite substantial investments in information and communication technology (ICT) infrastructure, equipment, and teacher training, the educational achievements in many of these nations remain substandard. However, why do people have these disagreements? It is generally agreed that computer use in education has progressed beyond teaching basic computer skills to include computer-assisted instruction, communication, and research. This process has been accelerated by the broad availability of electronic mail and the World Wide Web. The degree to which information and communication technologies (ICT) are integrated into the curriculum is determined by the socioeconomic conditions of particular nations and regions. Considering that the 2015 deadline for achieving the Education for All (EFA) goals has long since passed, it is evident that education and training play a key role in social and economic prosperity. However, the Kenyan Ministry of Education, Science, and Technology recognizes several difficulties in delivering education services that must be solved to achieve these objectives, including the need to ensure increased access, equity, and quality (Ng'asike, 2012). To address these concerns, a comprehensive Educational Management Information System (EMIS) architecture is being created to allow the collection, analysis, storage, retrieval, and transfer of pertinent data and information across all organizational levels. In addition to the Ministry's current efforts to channel additional resources toward creating sufficient ICT infrastructure, the Kenyan government intends to supply 20,000 computers to schools as a flagship initiative in the education sector under Vision 2030 and the Medium Term Plan (MTP). The Ministry of Education provided detailed pricing for the delivery of computers to schools based on a ratio of one laptop per teacher and one desktop for fifteen students from 2010 to 2015, a period that has since expired. From 2010 to 2015, Table 1 offers an overview of expenditures (in millions of Kenyan Shillings).

For ICT integration to be successful in the classroom, it has been argued that instructors must possess a particular level of technical knowledge and skills, or "competence" (Albirini, 2006). According to studies, teachers' lack of knowledge and skills in the domain of information and communication technology is a significant barrier to implementing ICT in the classroom (Balanskat et al., 2006; Scrimshaw, 2004). In Albirini (2006)'s study on teachers' attitudes toward computers, five independent factors, including computer proficiency, were explored. According to the collected data, the vast majority of responders lacked even the most essential skills for using computers in the classroom. The study's author stated that teachers would not employ technology at the school even if it were readily available if they had the essential background knowledge and training.

Furthermore, the literature suggests links between teacher professional development and student accomplishment. According to Newhouse et al. (2002), many unprepared educators are not enthusiastic about incorporating computers into their teaching practices. Teachers who are not well-versed in technology are more likely to be concerned about "potential technological problems," as Bingimlas (2009) puts it, because they cannot prevent or resolve such issues on their own (Bingimlas, 2009). The confidence of teachers in their abilities to use ICT in the classroom is also proportional to their level of knowledge and skill. According to Albirini (2006), educators' unwillingness to employ technology in the classroom is hindered by their lack of competency. Similar to the findings of the Becta survey, most instructors who claimed that a lack of confidence hindered them from utilizing ICT also cited inadequate knowledge in the sector (Bingimlas, 2009). In addition, teachers' computer skills significantly impact how they feel about implementing technology in the classroom (Albirini, 2006).

By and large, teachers viewed the incorporation of ICT into classroom operations negatively or indifferently (Al-Oteawi, 2002). Some studies emphasize the importance of knowledge and skills unrelated to technology, such as classroom management employing such tools. ICT resource management in the classroom is an example of technology-related classroom management skills. Teachers need classroom management skills to ensure that all students have access to ICT resources and respond appropriately when students struggle with their use (Hew & Brush, 2007). Successful ICT integration, also known as technology-supported pedagogical knowledge, necessitates subject-matter expertise and transferable abilities (Ertmer & Ottenbreit-Leftwich, 2010; Hughes & Morton, 2005). This knowledge has been characterized as instructors' familiarity with the relationship between the tools they use in the classroom and the educational objectives they seek to attain.

Research Methodology

This study aimed to examine how academic knowledge is managed in Indonesian high school culinary programs utilizing ICT tools. The study employed numerous research methods. Using an explanatory sequential mixed methods design, qualitative and quantitative data were collected for the analysis. The research employed a descriptive survey methodology driven by a pragmatic perspective. In Indonesia, the intended audience consisted of practical high school vocational art teachers. The sample included 19 high school educators. This information was compiled using interview guides and an educator survey. The quantitative data were evaluated and summarized using descriptive statistics (frequency counts, percentages, means, and standard deviations), then presented in tables and summaries. The qualitative data were analyzed using content analysis procedures and presented in narrative form according to thematic areas derived from the study variables.

As the exploitation of academic material to improve the quality of vocational training was the focal point of this study, it was determined that: According to Plomp (1997), culinary art programs in Indonesian art schools consist of two phases: prestage development (research) and development stage (development). (1) The preliminary investigation phases are included in the first step of pre-development or research. (2) the design phase (design), and (3) the design phase implementation. Phase four of testing, Evaluation, modification, and implementation comprise the fifth step. The rollout includes software developed, tested, and installed by instructors in technical high schools.

It is feasible to divide the phases of development listed above into three distinct phases: planning, design, and implementation. In the phase preceding real development, an IT-based model was utilized. The development cycle consisted of ICT-based academic information model application utilization. The model consisted of enhancing knowledge and data through implementation.

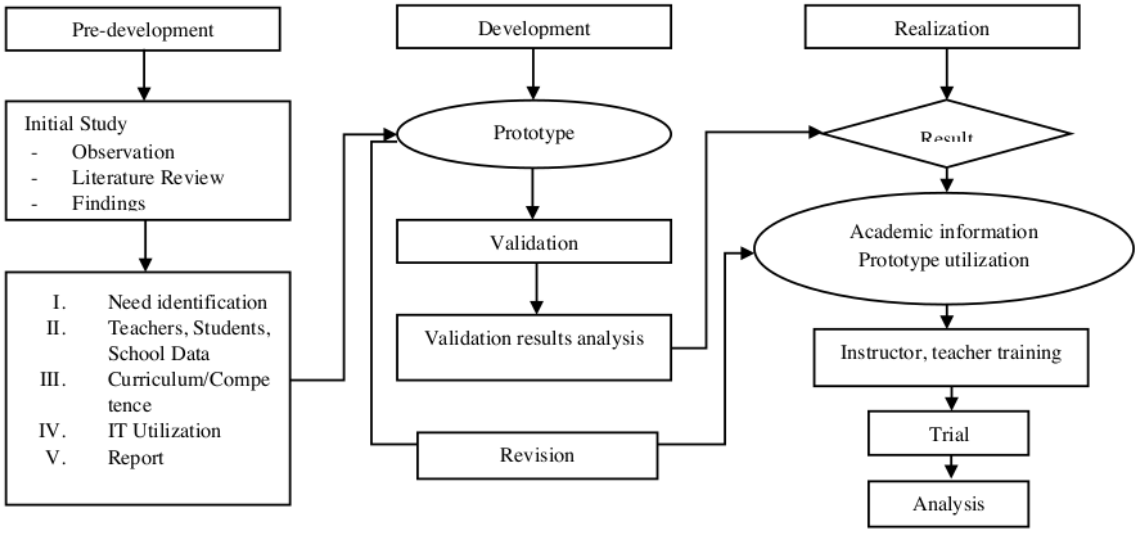

Figure.1: *ICT Model*

Data analysis and results

The goal of this research is to examine a model for evaluating an ICT-based information system to enhance the vocational high school culinary arts curriculum in Indonesia. Teachers were asked to respond to 22 Likert-scale questions to determine their degrees of technological pedagogical understanding for ICT integration. Table 1 displays the descriptive (IBM SPSS Statistics for software) analysis findings (Mean, Standard Deviation, Frequencies, and Percentages). These results demonstrate that the highest percentages of scores were in "1(5.3 percent) of teachers responded "strongly agree," 3(15.8 percent) of teachers responded "disagree," 8(42.1 percent) of teachers responded "neutral," 5(26.3 percent) of teachers responded "agree," and 2(10.5 percent) responded "strongly agree" with Mean score (M=3.21) and Std. Deviation (SD=1.07): "I can use technology to determine student's needs related to a content area in the pre-te. Regarding the statement, "I cannot design the teaching and learning process based on available technology resources," the majority of respondents answered no. 8((42.1%) of teachers responded "neutral", 4((21.1%) of teachers responded "agree", and 7((36.8%) of teachers responded "strongly agree", with Mean score (M=3.95) and Standard Deviation (SD=0.91). 1(5.3 percent) of teachers responded "strongly disagree," 2(10.5 percent) of teachers responded "disagree," 7(36.8 percent) of teachers responded "neutral," 6(31.6 percent) of teachers responded "agree," and 3(15.8 percent) of teachers responded "strongly agree" to the statement "I can develop appropriate vocational art language assessment tools by using technology" with Mean score (M=3.42) and Std. Deviation (SD=0.18) (1.07). Regarding the statement, "I can implement effective classroom management in the technology-enhanced teaching and learning process," the correct response is: "2(10.5%) of teachers responded "agree," 7(36.8%) of teachers responded "neutral," 5(26.3%) of teachers responded "disagree," and 5(26.3%) of teacher participants responded "strongly disagree" with Mean score (M=3.68) and Standard Deviation (SD=1.003). Likewise, for the statement "I can adhere to the teaching profession's rules of ethics in an online educational setting (WebCT, Moodle)," the answer is "yes." 1(5.3%) of teachers responded "strongly disagree," 1(5.3%) of teachers responded "disagree," 5(36.8%) of teachers responded "neutral," 5(36.8%) of teachers responded "agree," and 3(15.8%) of teachers in this study responded "strongly agree" with mean score (M=3.53) and standard deviation (SD=1.02).

In addition, 11.1% of teachers responded "strongly disagree" with the statement, "I can troubleshoot any type of problem that may arise while using technology in any phase of the teaching-learning process." 16.7% of teachers responded "disagree"; 44.4% responded "neutral"; and 27.8% responded "agree." The Mean score (M=3.37) and Standard Deviation (SD = 0.05) for this item were 3.37 and 0.05, respectively (0.83). Moreover, under the item "I can use technology to solve problems (by structuring, updating, and linking the content to the real world). Three (15.8 percent) of teachers agreed. and 7 teachers (36.8 percent) responded "neutrally." 8(42.1%) of teachers responded "disagree" and 1(5.3%) responded "strongly disagree" with the statement, with Mean score (M=3.37) and Standard Deviation (SD=0.11) (0.83). Regarding the statement, "I cannot use technology to construct language activities based on the needs of students to strengthen the teaching and learning process," the answer is false "a vast majority 9 (47 percent) "I cannot become a leader in my future teaching community in promoting the use of technological innovation" Moreover half of vocational art skills teachers "agreed" or "strongly agreed" with the majority of items, as indicated by a mean score of 3.5 or higher. However, most teachers responded "neutral" to this research question. Examining these results, as indicated by the response "neutral," I concluded that most teachers in this study were unaware that their focus is on how instructors in Indonesia's vocational high school culinary art program may put classroom knowledge into practice utilizing classroom knowledge and skills.

Further results predicted in the tables indicate that the data obtained could be described as valid, "that is: (1) if the information according to academic activities undertaken in the school is declared valid with an average score of 4, indicating strong agreement that the application provides academic information; and (2) if the program produces accurate and comprehensive academic data for the user with an average score of 4, indicating strong agreement that the program produces accurate and comprehensive academic data for the user. (3) Creates academic data containing the truth that is compatible with the process's calculations and is considered valid with an average value of 4, indicating good agreement with the application since it produces academic data including the truth. (4) Produces information that can aid in choosing the same alternative or strategy from several users of the academic information system. It is judged valid with a mean score of 3.50, suggesting agreement with the application as it can aid decision-making. (5) The information is presented in user-friendly language. It is judged

legitimate with an average score of 3.50, suggesting that the application is clear and understandable due to straightforward language. (6) Displays information values in numbers and letters with a mean score of 3.5, suggesting that both the numbers and letters are intelligible. Valid with a mean score of 4, indicating that the program can improve teacher performance productivity. The average result of 4 indicates that utilizing this application can improve the quality of learning. This statement is confirmed by the average score of 4, implying that student competence can be boosted by implementing this program. The average score for the statement (10) is 4, indicating that this application can improve school quality. Therefore, it was found that the application is legitimate and functional and that it could be implemented and make a significant contribution to the learning process at the vocational high school culinary art program in Indonesia."

Table.1: *Teachers Assessment on the Application of Academic Information*

Statements	**SD**	**D**	**N**	**A**	**SA**	**M**	**SD**
Update an instructional material (paper-based, electronic or multimedia materials, etc.) based on the needs (students, environment, duration, etc.) by using technology.	3(15.8)	3(15.8)	3(15.8)	7 (36.8)	3 (15.8)	3.21	1.36
Use technology to determine student's needs related to a content area in the pre-teaching process	1 (5.3)	3(15.8)	8(42.1)	5 (26.3)	2 (10.5)	3.21	1.07
Use technology to develop language activities based on students" needs to enrich the teaching and learning process	1 (5.3)	2(10.5)	4(21.1)	9 (47.4)	3 (15.8)	3.58	1.04
Plan the teaching and learning process according to available technological resources	0	0	8(42.1)	4 (21.1)	7 (36.8)	3.95	0.91
Develop appropriate vocational skills assessment tools by using technology	1 (5.3)	2(10.5)	7(36.8)	6 (31.6)	3 (15.8)	3.42	1.09
Implementing effective classroom management in the teaching and learning process in which technology is used	0	2(10.5)	7(36.8)	5 (26.3)	5 (26.3)	3.68	1.003
Assess whether students have the appropriate content knowledge by using technology	1 (5.3)	4(21.1)	3(15.8)	8 (42.1)	3 (15.8)	3.42	1.17
Apply proper instructional approaches and methods appropriate to individual differences with the help of technology	2(10.5)	2(10.5)	5(26.3)	8 (42.1)	2 (10.5)	3.32	1.16
Use technology for implementing language activities such as homework and projects	2(10.5)	1 (5.3)	2(10.5)	8 (42.1)	6 (31.6)	3.79	1.27
Use technology-based communication tools (forum, chats, email in the instructional process	0	4(21.1)	4(21.1)	6 (31.6)	5 (26.3)	3.63	1.12
A suitable model for the students in following codes of ethics for the use of technology in Vocational art skills	1 (5.3)	3(15.8)	4(21.1)	6 (31.8)	5 (26.3)	3.58	1.22
Use innovative technology (Facebook, Twitter, blogs)to support the vocational skills learning process	0	0	4(21.1)	8 (42.1)	7 (36.8)	4.16	0.77
Cannot use technology to update my knowledge and skills in the content areas that I will teach	0	1 (5.3)	0	6 (31.6)	12(63.2)	4.53	0.84
Update my technological knowledge for the vocational teaching process	0	0	2(10.5)	8 (42.1)	9 (47.4)	4.37	0.68

Statements	SD	D	N	A	SA	M	SD
Use technology in every phase of the teaching and learning process by considering the copyright issues (licenses)	1 (5.6)	5(27.8)	3(16.7)	6 (33.3)	3 (16.7)	3.28	1.23
Follow the teaching profession's codes of ethics in an online educational environment (Web CT, Moodle)	1 (5.3)	1 (5.3)	7(36.8)	7 (36.8)	3 (15.8)	3.53	1.04
Guide students by leading them to valid and reliable digital sources	0	1 (5.3)	5(26.3)	9 (47.4)	4 (21.1)	3.84	0.83
Behave ethically regarding the appropriate use of technology in educational environments	0	3(16.7)	2(11.1)	7 (38.9)	6 (33.3)	3.89	1.08
Troubleshoot any kind of problem that may occur while using technology in any phase of the teaching-learning process	2(11.1)	3(16.7)	8(44.4)	5 (27.8)	0	2.89	0.96
Use technology to find solutions to problems (structuring, updating and relating the content to real life)	0	3(15.8)	7(36.8)	8 (42.1)	1 (5.3)	3.37	0.83
Become a leader in spreading the use of technological innovation in my future teaching community	0	2(10.5)	3(15.8)	9 (47.4)	5 (26.3)	3.89	0.94
Cooperate with other disciplines regarding the use of technology to solve problems encountered in the process of presenting content	0	1 (5.3)	2(10.5)	11 (57.9)	5 (26.3)	4.05	0.78
Providing data information is in accordance along with the academic activities which are undertaken at school	3(15.8)	3(15.8)	3(15.8)	7 (36.8)	3 (15.8)	4	0.87
Constructing comprehensive and precise academic data for their users"	1 (5.3)	3(15.8)	8(42.1)	5 (26.3)	2 (10.5)	4	0.90
Constructing academic data which containing the truth which is being in accordance along with the calculations which happen in the process	1 (5.3)	2(10.5)	4(21.1)	9 (47.4)	3 (15.8)	4	0.85
Providing information that could help to make the same decisions through various academic information systems users	0	0	8(42.1)	4 (21.1)	7 (36.8)	3.5	0.87
The presented information is being to be a clear to understand	1 (5.3)	2(10.5)	7(36.8)	6 (31.6)	3 (15.8)	3.5	0.97
Presenting the information with respect to numbers and letter are valuable	0	2(10.5)	7(36.8)	5 (26.3)	5 (26.3)	3.5	0.91
Improving productivity performance of teachers.	1 (5.3)	4(21.1)	3(15.8)	8 (42.1)	3 (15.8)	4	1.45
Improving learning quality	2(10.5)	2(10.5)	5(26.3)	8 (42.1)	2 (10.5)	4	0.96
Enhancing competencies of students	2(10.5)	1 (5.3)	2(10.5)	8 (42.1)	6 (31.6)	4	0.923

Source: Researcher's Illustration

Note: SD-strongly disagree, DA-disagree, N-Neutral, A-agree, SA-strongly agree, SD-standard deviation, M-mean

As such, the purpose of this study was to validate a model for evaluating ICT-based educational information systems in the culinary arts programs of Indonesian vocational high schools. Consequently, the researcher intended to examine the technological expertise of a vocational culinary skills instructor for ICT integration. In other words, the researcher aimed to ensure that teachers of vocational culinary skills levels

successfully and confidently incorporate ICT into their classes. In addition, the researcher conducted interviews with teachers to determine their degrees of ICT training, techniques for ICT integration, and subject areas in which they use ICT tools to instruct. One of the questions in the interview guide was, "Have you received ICT training and, if so, to what extent have you applied this knowledge to teaching vocational art skills?" In additi, the researcher wished to establish teachers' ICT training and professional development to integrate ICT into the classroom. The majority of teachers in this study felt that ICT training and professional development is a significant element impacting their attempts to utilize ICT to teach vocational art skills, according to the results of the interviews. The d shows that most (N = 16) have participated in or attended ICT training programs.

However, most teachers who participated in the study reported training in Microsoft Office, PowerPoint, and other standard classroom software. In addition, only a small fraction (N=3) had received their education from reputable computer science-focused universities. In addition, only 4% of instructors reported receiving support for ICT training from the Ministry of Education. Two instructors had finished the IT Diploma requirements, while the other two had achieved the computer/ICT Certificate criteria. One instructor who attended this training stated that she occasionally utilizes it to teach her kids vocational art skills (TR1). She continued by stating that she had been unsure how to include ICT in her teaching of Vocational topics for the past three years. She also said that she used a digital projector and PowerPoint slides to demonstrate grammar clips in her vocational lessons and that using ICT to teach vocational art skills enabled her to access new resources from the internet. She mentioned that she uses PowerPoint to impart vocational topics. I also incorporate computing into evaluating vocational art abilities, and I use technology to expand students' understanding of these talents. I strongly encourage kids to speak and transcribe words while others listen to CDs. (TR1).

Similarly, the researcher questioned teachers, "What efforts have you made to strengthen your technical skills for integrating ICT in vocational art skills efficiently and competently?" Teachers of vocational art skills were united in their support for ICT training and professional development to enhance teachers' technical pedagogical understanding in preparation for ICT integration in te ing vocational art skills. To this end, sixteen teachers reported having completed ICT training courses. Three teachers responded that they had not had ICT training but were registering with various ICT training institutions to receive training since they deemed it vital for instructional purp s. Table 2 summarizes the interview replies of teachers.

The primary purpose of this study was to validate a context for the evaluation of academic information systems knowledge, which encompasses instruction, classroom management, lesson planning, and student progress evaluation. It entails knowing how to educate your audience and assess their comprehension of the material (Deshmukh, 2013). Knowledgeable educators are comprehensively aware of the processes via which their students learn new content, acquire new competencies, and develop healthy learning routines and attitudes. There are two key uses for ICT as a teaching tool in vocational education. The instructional strategies of teachers must be adapted to accommodate these characteristics. The effectiveness of a wide range of ICT applications can be demonstrated by combining these two methods. Vocational art instruction (VAI) practitioners are expected to teach content knowledge using a pragmatic pedagogical strategy and ICT skills and knowledge. Urgent is the quality use of ICTs and their use with a pedagogical motivation, with an exclusive focus on vocational art skills materials and ICT facilities as educational and environmental agents (Deshmukh, 2013). In this study, TPK examines how using particular technologies impacts teaching and learning. In teacher research, "pedagogical knowledge" (PK) refers to a person's familiarity with many areas of education. The researcher analyzed replies to identify examples of teachers' technological pedagogical knowledge (TPK) to determine which forms of TPK influenced teachers' decisions. According to the findings, teachers taught practical art skills using solely traditional pedagogical expertise in two methods. How well-versed educators are in the art of class scheduling and the implementation of good time-management practices. In addition, the TPK scale demonstrated educators' understanding of the characteristics, attributes, and capabilities of numerous technical devices (such as PowerPoint, YouTube, Websites, and the Internet). A teacher stated, "I require my students to explore the internet for correct sounds and word pronunciation. I at pt to include this as part of their assignment in most lessons. Due to scarcity, however, not all students had access to computers and the internet at school; I urged them to work in groups. I suggest encouraging them to conduct a Google search for language-related content relevant to the session. I believe it is essential that the students enhance their vocational art abilities, proficiencies, and competencies (TR6). This remark is limited to the internet and its applications; it pertains to Google Sites, Web Sites, and other Internet- or Google-based resources. Occasionally, teachers appear to use other tools in their

lessons, displaying familiarity with these resources. The study indicated that vocational teachers utilized TPK in two ways when instructing: First, TPK can relate to teachers' use of various technological aids in the classroom. For example, a teacher reported: "On occasion, I instructed pupils to conduct a Google search on a particular lesson-related topic. I targeted them by browsing the internet for pertinent materials on vocational art skills and noted that ICT should be responsive to students' needs, biases, and passions. Students acquire new Vocational abilities (TR4). To evaluate students' knowledge and skills, instructors periodically referred to various ICTs, such as online decision forums for collaboration and the construction of digital storytelling projects, as well as the formation of Google sites to check students' design capabilities. Students are occasionally assigned online talks, and the instructor creates a forum for them. Therefore, TPK emphasizes encouraging students to utilize their creativity when utilizing the numerous available tools. As a medium of communication and social networking, teachers may produce blogs or podcasts or establish 58 MS Office environment for students to practice occupational arts and skills. Second, instructors reported confidence in their ability to use technology throughout the pre-teaching process to evaluate their students' subject-specific requirements. Teachers utilized radio cassettes to improve the teaching of expository writing, particularly the teaching of the art of writing (TR.4). Second, the data demonstrated that a minority of instructors had an average level of TPK knowledge, while most teachers had poor VAT understanding levels. Raupach et al. (2015) revealed that less than half of Saudi High school teachers (N=13) possessed a high level of TPK knowledge, a third (88; 35 percent) 54 ssessed a medium level, and only 20 percent of the participants possessed a poor level of TPK knowledge. According to Beaudin and Hadden (2004), teachers' pedagogical skills should benefit from a thorough examination of classroom ICT usage. Similarly, the findings revealed that most Vocational teachers in Indonesian secondary schools lack TPK. According to findings from interviews, most teachers were dissatisfied with the technological pedagogical skills required for ICT integration in vocational art education. TPK was defined and validated by M. Koehler and Mishra (2009) as an understanding of how particular technological tools might influence classroom instruction and student results.

The fact that M. J. Koehler et al. (2007) claimed that teaching efficacy necessitates a solid comprehension of pedagogical knowledge and the application of this knowledge in a constructive manner for instruction supports this assertion. Similarly, data found disparities among Vocational teachers regarding their TPK. Although TR16 and TR17 claimed to have learned general ICT abilities, they lacked adequate TPK understanding. This study also revealed that all subjects in the Inaction stage had limited or no TPK. While teaching vocational art skills, teachers in the Investigation and Application stages demonstrated low to moderate TPK levels and poor ICT integration efficacy. These 49 ults support the premise that the more a teacher's TPACK, the more successful their ICT integration (M. J. Koehler et al., 2007).

On the other hand, most educators reported familiarity with e-mail and Microsoft Office applications such as Word and PowerPoint. In addition, TR3 asserted proficiency with Microsoft Office, particularly Word, PowerPoint, and Excel. TR4 also reported comfort with using a laptop in class, connecting it to an outlet, and installing a projector for presenting PowerPoint slides. Based on these data, the study concluded that competency in areas such as word processing, spreadsheet use, internet navigation, and e-mailing is indicative of proficiency in all other necessary computer-related areas. Additionally, the Inaction level TR9 disclosed that she had finished an introdu 57 ry computing course. It demonstrates that teachers of Vocational topics require more than technical expertise to integrate ICT into their lessons successfully. In addition, these results indicate that teachers' knowledge of ICT in this study fell between low and moderate levels, as they were only able to use applications such as MS Word (word processing), PowerPoint, and e-mailing, as these are the most commonly and frequently used applications for teaching. These findings are congruent with the results of Singh and Chan (2014), who discovered that most teachers had limited expertise in apps, including word processing and internet browsing.

Similarly, findings from interview counts indicated that most teacher 20 cked adequate technical skills to integrate ICTs into their vocational program classroom education. These findings are supported by a study conducted by Fook et al. (2011) and Zaituni et al. (2010). Their findings concluded that despite having positive attitudes toward ICT integration, Malaysian teachers lacked skills because they were unfamiliar with many new software applications.

According to Samsani et al. (2013), incorporating ICT into the pedagogy of vocational art skills requires buy-in from school administration, a can-do attitude fro 44 vocational educators, ongoing professional development to maintain educators' ICT skills, and instruction in the proper use of ICT tools. The argument of

M. J. Koehler and Mishra (2005) is supported by research indicating that teachers are more likely to successfully integrate technology into their lessons when they are exposed to it within lesson contexts that model strong connections between instructional strategies, student learning outcomes, and subject area expertise. Technological pedagogical content knowledge (TPACK) is an in-depth understanding of the interwoven web of relationships between content, pedagogy, technology, and their respective settings. Due to the lack of training programs in vocational art skills, most secondary school teachers in this study also possessed low ICT proficiency and TPK. Several studies from industrialized countries Archambault and Crippen (2009); Giannakos et al. (2015) discovered that instructors had a high TPK scale score. According to Bauer et al. (2002), the first step in incorporating technology into vocational art skills workshops is to provide instructors with proposals for integrating technology into the curriculum and pedagogically sound lesson design. The results indicated that teachers did not apply TPACK principles when instructing Vocational topics.

Table.2: *Teachers ICT Training*

Teacher	ICT Training	Institution/Ministry	ICT Course/Levels
TR 1	Yes	No	Basic Comp. Skills
TR 2	Yes	Yes	Cert. in ICT
TR 3	No	None	Basic Comp. Skills
TR 4	Yes	Computer Training Col.	Cert. in ICT
TR 5	Yes	Computer Training Col.	Basic Comp. Applications
TR 6	Yes	Computers in computer Lab	Diploma in IT
TR 7	Yes	Ministry (MoES &T)	Diploma in ICT
TR 8	Yes	Computer Training Col.	Projector, Mobile Phone
TR 9	Yes	Computer Training Col.	None
TR 10	No	None	None
TR 11	Yes	Ministry (MoES & T)	General ICT Applications
TR 12	Yes	None	General ICT Applications
TR 13	No	None	None
TR 14	Yes	None	Basic Comp. Skills
TR 15	Yes	None	Basic Comp. Applications
TR 16	Yes	None	Comp. Packages
TR 17	Yes	None	Comp. Packages
TR 18	Yes	Comp. Training Col	Cert. in Computer
TR 19	Yes	None	Basic Comp. Skills

Note: Cert-Certificate; COL-College; Comp-computer
Source: Researcher's Illustration

Conclusion and recommendations

On the Teacher Professional ICT Attribute Framework, the majority of teachers of vocational art skills sat in the lower critical usage border: Inaction and Investigation stages, accounting for between 0 and 20% and 20% to 40%, respectively. ICT is a significant aspect that could affect teachers' desire to include it in their trade skills training. Lack of support and motivation at schools, government and limited access to Internet and ICT resources, inadequate ICT facilities, infrastructure, and lack of ICT training are some obstacles teachers face when attempting to integrate ICT into vocational skills training classrooms. In this study, most vocational art teachers lacked proper ICT training, resulting in poor TPK levels. The country's vocational high school teachers should receive universal ICT fundamentals training. Teachers of vocational art should be incentivized and trained in fundamental and advanced ICT skills to be technologically equipped to integrate ICT into their classrooms. As a crucial aspect of the ICT integration process, it is recommended that teachers' technological expertise be addressed. Professional and pre-service language teacher development programs should also focus on integrating changes in teachers' specialized pedagogical knowledge and philosophies for teaching and learning with their instruction on integrating ICT tools into their studies appropriately and effectively. To facilitate the integration of ICTs into the teaching of vocational training skills in secondary schools, it is crucial to have a solid ICT infrastructure basis. The educational

stakeholders should establish an ICT implementation strategy by giving the specific and explicit policies necessary to transform the language teacher's educational vision and objective into a reality.

The above outcomes led us to conclude that applications could be utilized as information professionals for curricular activities at the Vocational High School. The applications serve as information generators for decision-makers. The applications have the potential to improve educator and student performance. In general, however, the application is sound. Educators may efficiently use it to raise the bar for all schools, especially Indonesian vocational high schools offering culinary arts programs.

Implications and Future Directions

The study's purpose was to evaluate teachers' ICT-based information in Indonesian vocational high schools to improve art skills. This study's findings may prompt occupational language instructors to reconsider their use of technology in the classroom. The study findings would aid school administrators in establishing and/or revising applicable policies to optimize the use of ICT in pedagogy by all instructors, hence minimizing the waste caused by the underutilization of ICT resources. The study's findings could also be utilized by Vocational language teacher educators, education policymakers and stakeholders, language educational institutions, and curriculum developers to increase teachers' understanding of the relevance of their knowledge to the application of ICTs in pedagogy. Moreover, the outcomes of this study will contribute to the body of knowledge by shedding light on how knowledge connects to the use of ICTs in pedagogy.

Consequently, the findings of this study have contributed to the theory that teachers' cognitions influence their choice of teaching strategies and, therefore, their practice with ICTs in vocational skills classrooms, and have provided "behind the scenes" information that explains why teachers of vocational skills choose to use or not use particular novel pedagogical strategies to integrate ICTs into their instruction. Consequently, these contributions are essential to the philosophy of teachers' professional activity and the use of ICTs in teaching practicums. In addition, the findings of this study have drawn more attention to the level of ICT integration to increase and promote the use of ICT tools, particularly in Kenyan secondary schools. The findings of this study have added to the expanding body of knowledge addressing the integration of ICTs in Indonesian high school vocational education programs.

In addition to practical and theoretical ramifications, the present work has significant limitations that may constitute a new research topic in the future. This study was conducted within the context of Indonesia, a developing country with limited applicability to wealthier economies. To increase the generalizability of this study, future research could focus on other wealthy nations. To determine the variability of the findings, additional research could be conducted using either quantitative or qualitative methods separately. Thirdly, the research was restricted to vocational programs, but there are various other programs. Therefore, future studies could be conducted on multiple English or mathematics programs to determine the variability of the research results.

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