Elementary Teachers' Competencies in Planning, Creating, and using ICT-based Learning Media

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Abstract: The main purpose of this study is to explore the level of teachers' skill in planning, creating, and using ICT-based learning media. A descriptive quantitative research design was implemented within this study by using survey as the instrumentation which used a set of questionnaire to measure teachers' knowledge in planning, creating, and using ICT-based learning media. The participants for this study are Elementary School teachers in Banjarmasin. The results of this study were analyzed using descriptive analysis. The finding was that the majority of the respondents had moderate level of Planning (M= 3,46, SD= 0,62,), Creating (M= 2,51, SD= 0.73), and Using (M= 3,19, SD= 0,60). The teachers' skill in planning correlated with the teachers' skill in creating (ryx = 0.96), and using (ryx = 0.89). The teachers' skill in creating correlated with the teachers' skill in using (ryx = 0.87). The findings indicate the need to train teachers in planning, creating, and using ICT-based learning media. Because of low skill of elementary teacher will only impede the success of all ICT initiatives introduced by the ministry.

1 INTRODUCTION

The rapid changing of ICT has brought a substantial impact on all spheres of human activities, including education system. It has also provides a new challenge for teachers to implement innovative learning activities and in accordance with education demand of 21st century. Unfortunately, some results of researches indicated that the teachers' level of ICT integration is still at the low level, although in general they admitted that ICT positively affects their teaching practice and their students' learning (Umar, 2015).

ICT is basically a tool. It can be hardware (such as computers, Radio, Telephone, projector, camera), software (such as PowerPoint, Adobe Flash, Video, Excel, Websites), or both. In the educational context, it mainly refers to various resources and tools (software) presented on the computer. Educational ICT tools can be divided into 3 categories: Input source, Output source and Others. The input source consist of visualizer/ document camera, Computer/ laptop, Slate/ tablet, Student response system, application software. The output source consist of projector, interactive whiteboard and display; monitor, TV etc. Others technology consist of digital camera, switcher, digital recorder, and other technology (Wang & Woo, 2007).

Pavla HLÁSNÁ (2017) lists several benefits of the use of ICT on teaching and learning in primary education:

1. Students' concentration in learning is better than learn with teachers
2. Learning activities become more personalized
3. Learning becomes on the one hand more independent, and on the other more provide facilities to collaborate with others
4. Learning activities can happen anywhere and anytime
5. Learning material is more up-to-date and can be be tailored according to students' immediate needs
6. Thanks to multimedia activities, the learning atmosphere becomes more varied and dynamic
7. Learning activities require critical thinking
8. Learning activities become more culture conscious.

Aktaruzzaman explained the roles of ICT in education are as follows: a) ICT encourages learning anytime and anywhere; b) ICT helps everyone to access learning resources; c) ICT sets up individuals

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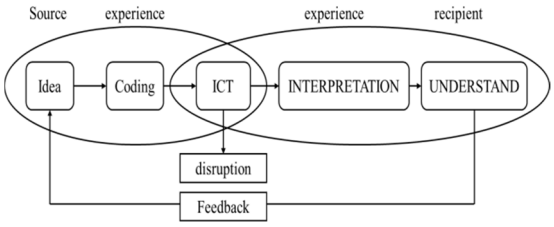
for the workplace; d) ICT increases the quality of education process and learning outcome; and e) ICT turns learning environment into learner-centered of learning (Aktaruzzaman, 2011).

Based on the description above, the use of the ICT has many benefits for education, namely: 1) display of multimedia in ICT can improve the retentive memory of students, 2) teachers can easily explain complex instructions and ensure students' comprehension, 3) teachers are able to create interactive and active classses and present the lesson more enjoyable, 4) improve students attendance and concentration, 4) removing the fear of students to some subjects that abstract and considered difficult, and 5) improving student achievement.

ICT Competence for teacher has been vey important in this era. So that, Indonesia Government has determined the ICT competencies as one of the skills that must be mastered by the teacher (Regulation of National Education Minister No. 16, 2007). The use of the ICT in education has supported some characteristics of curriculum 2013. Such as, suggesting the communication from anywhere, to anywhere, emphasizing the importance of cooperation and collaboration in solving problems, increasing attention of educators (Wang & Woo, 2007).

On the other hand, the ICT functions can not be claimed will replace the role of the teacher. ICT is just a tool introductory message or one of the students' learning facilities. Therefore, teachers need to keep active in guiding the process of learning activities. The position of ICT in the communication system can be described as follows (H. H. Batubara, 2015).



Picture 1. The position of ict in the communication system

The need and urgency for developing technological literacy, although not a new idea, emerged with greater emphasis in the early 1980's. With this increasing awareness and interest, technology quickly was recognized as a powerful vehicle for offering educators innovative ways to enhance student learning. In the early 1990's the International Society for Technology in Education, ISTE established standards defining technological literacy for teacher education. ICTs are a potentially powerful tool for extending educational opportunities, both formal and non-formal, to previously underserved constituencies – scattered and rural populations, groups traditionally excluded from education due to cultural or social reasons such as ethnic minorities, girls and women, persons with disabilities, and the elderly, as well as others who for reasons of cost or because of time constraints are unable to enrol on campus (Aktaruzzaman, 2011).

The systematic of ICT integration into teaching and learning is divided into three areas, namely: (1) design planning, (2) creating learning media, and (3) using in teaching and learning. According to Sukiman, the components of integrating ICT to create lesson plan are consists of: (1) analyzing the needs and characteristics of students, (2) formulating standard competencies and indicators of learning outcomes, (3) developing subjects content, (4) formulating assessment instrument, and (5) writing story board. The components of ICT integration in creating learning media are consists of a teacher's ability in : (1) operating application of graphic design, audio, video, and animation, (2) blended media component using the computer application, and (3) evaluating product based on the principles of ICT media development (Sukiman, 2012). There are some general principles in creating ICT are: 1) Visible: easy viewing, 2) Interesting, 3) Simple, 4) Useful for students or users, and 5) Accurate: true and on target, 6) Legitimate: legitimate and reasonable, 7) Structured: well structured, and 8) coherent (Aqib, 2013).

According to Totok A. Soefijanto, education observer of Paramadina Public Policy Institute, the use of ICT in Indonesia school is still about 20 percent. Even less in Elementary School (Admin, 2015). The factors that affect elementary teachers' decision to integrate ICT in education are limited teacher to join training in ICT integration, technical support, pedagogical support, access to technology resources, teachers' skill in using multiple ICT tools and skills (Hafez, 2013).

The result of initial study on Elementary teachers as participant training interactive media showed that most elementary schools already have facilities that support the use of ICT. So, the purpose of this study is to explore teachers' competencies in ICT integration in creating lesson plan, creating learning media, and teaching and learning process, This study is important to be done in order to know and to map the teachers' competence so the data can use as a tool to increase the teachers' competence.

2 METHODOLOGY

2.1 Research Method

A descriptive quantitative research was employed in this study. Additionally, this study belongs to study of exploration that explain the phenomenon of description between variables based on theory and research of previous research using empirical data (Cooper, 2003) which used survey method and using instruments to acquire data for all variables. This design was chosen because it is more practical when involving respondents and the process of collection of data is done in a short period of time.

2.2 Study Participants

The population in this study is elementary school teachers of grades 1st to 6th. The researchers delivered the instruments to the elementary schools from five area in Banjarmasin (West Banjarmasin, South Banjarmasin, East Banjarmasin, Middle Banjarmasin, and North Banjarmasin), South Kalimantan, Indonesia.

A cluster sampling was used in this study. The researchers determined the sampled Elementary Schools for each area. In this study, the researchers conducted it within two steps. Firstly, the researchers determined the sampled Elementary Schools from the five areas in Banjarmasin is 62. To determine the ideal sample size for this population, the opinions of Gay & Diehl was used. (Gay L.RR. and Diehl, 1992) They state that the sample should be 10 % of population. Therefore, the sampling of elementary schools from five areas in Banjarmasin are 10% x 62= 6 primary schools.

Secondly, the researchers determined the sample teachers who represented the sampled schools from each area. The population in this study was 62 Elementary School teachers from 6 sampled elementary schools in Banjarmasin. To determine the ideal sample size for this population, Slovin's formula was used. Slovin's formula stated that n= N/(1+N.e2)), where n= number of samples, N= total population, e= margin of error and therefore sample of this study was n= 75/ (1+75(0.05)2)= 63 teachers with e =0.05.

The researchers delivered survey to 6 randomly selected elementary schools directly by hand to the teachers at the schools. A total 0f 63 questionnaires were distributed. A total of 50 over 63 questionnaires or 80 % were successfully returned to the researcher. Thus, total of participants is 50 elementary school teachers.

2.3 Research Instruments

The instrument was survey instrument to measure teachers' competence in integrating ICT. It is consist of planning, creating and using ICT in teaching. The survey was developed based on Sukiman theory (Sukiman, 2012). The survey items are of 5-point Likert's scale (from 1—strongly disagree to 5-strongly agree). A brief demographic information was also used to obtain the background characteristics of the participants. A brief demographic questionnaire was constructed to obtain information of the participants including gender, level of education, number of years of experience in teaching, and status for professional teaching.

2.4 Data Analysis

Internal reliability of the three construct was first established through high Cronbach alphas for all cojnstructs: Planning ($\propto$= .784), creating ($\propto$=.872), and using ($\propto$= .902). The analyses in this study was conducted using the Statistical Package for the Social Science software (SPSS) 19.0. Descriptive analyses were used to describe the research data. The descriptive analyses involved were the mean, percentage, frequency, and standard deviation.

3 RESULT AND DISCUSSION

3.1 Profile of Participants

Table 1, Table 2, Table 3 and Table 4 below reflects the number and percentage of teachers' gender, years of experience in teaching, level of education, and status of teachers professional.

Table 1. Frequency and percentage of teachers' gender

Gender	Percentage
Male	40%
Female	60%

Table 1 above shows the number of teachers that were involved in this study. According to gender, this indicates that there were more female teachers than male teachers.

Table 2. Frequency and percentage of teachers' experience in teaching

Experience in Teaching	Percentage
< 10 years	86%
11-20 years	12%
>20 years	2%

Table 2 above shows that the distribution of teachers' years of experience in teaching. Most of the teachers had <10 years of teaching experience were 43 teachers or 86 %.

Table 3. Percentage of teachers' education level

Experience in Teaching	Percentage
Diploma	6%
Under Graduate	90%
Post Graduate	4%

Table 3 above shows that the distribution of teachers' education level. Most of the teachers were qualified teachers as having an under graduate (S1) with total of 45 teachers or 90 %

Table 4. Frequency and percentage of teachers' professional status

Status	Percentage
Yes	26%
No	74%

Table 4 above shows that the distribution of teachers that have teachers' professional certificate. Most of 37 teachers or 74 % did not have certificate of teacher professional.

3.2 Level of Elementary Teachers' Competencies in Planning, Creating, and using ICT-based Learning Media

The following is descriptive analysis for the research's findings. The descriptive analysis involved the mean, percentage, frequency, and standard deviation the mean and standard deviation. Table 5 shows each subscale consisting of teachers' skill in planning, creating, using ICT-based learning media.

Table 5. Mean, standard deviation and categorization of planning, creating, and using ICT

Dimension	Mean	Std. Deviation
Planning ICT-based learning media	3.4640	.61735
Creating ICT-based learning media	2.5120	.73252
Using ICT-based learning media	3.1920	.60435

Table 5 above shows mean and standard deviation of teachers' competence. Most of the teachers express that the teachers' skills in planning is better than the teachers' skills in using, and the teachers' skills in using is better than the teachers' skills creating.

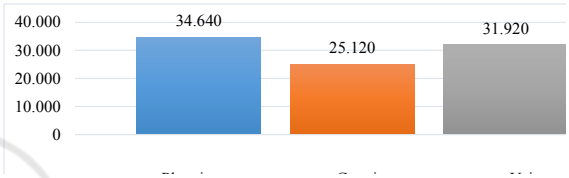


Figure 2. Level of competence teacher in planning, creating and using ICT

Based on the table 5 and figure 2 above, The criteria divided into three groups: low, moderate, high was described (Azwar,1986). The categorization level criteria, frequency, and percentage about planning, creating and using ICT in teaching is explained as below:

3.2.1 Planning ICT-based Learning Media

The instrument survey to discribe teacher competence in planning ICT has ten statement items as in the table vi.

Table 6. Mean and standard deviation of teachers' competence in planning ICT

Dimension	Level		
	High	Moderate	Low
I identify students' need	4	44	2
I analyze standard competence	2	45	3
I adjust kind of media with content	4	39	7
I analyze characteristic of lesson	5	39	6
I develop content of media based on curriculum regularly.	6	37	7
I consider available resource, i.e. teachers' competence, facilitation,	4	42	4

finance			
I consider available time	5	36	9
I create assessment to evaluate ICT	3	41	6
I always create story board before creating ICT	5	41	4
I ask expert people to evaluate my story board	18	27	5

The table above shows that teachers knowledge about planning ICT-based learning media is in moderate level. Some Elementary School teachers are confident to analize students' need and characteristic, standard competence, lesson characteristic, adjust kind of media, develop content based on curriculum, consider finance, facilitation, and teacher competence, and create story board. But, mean of teacher in creating assessment and asking people to evaluate their story board have taken lower position than the others. Items of ICT instruments in planning ICT-based learning media is in accordance with the theory Sukiman.

Table 7. Frequency and percentage of teachers' competence in planning ICT

Level of Teachers' Planning	Categorization Level	Range of Value	Percentage	Level of Teachers' Planning
Low	$x<(\mu-1.0\sigma)$	$x < 2.85$	16%	Low
Moderate	$(\mu-1.0\sigma)\leq x\leq(\mu+1.0\sigma)$	$2.85 \leq x \leq 4.08$	62%	Moderate
High	$(\mu+1.0\sigma)<x$	$4.08 <x$	22%	High
Total			100.0	Total

The table 6 above shows that the competence of teachers in planning ICT-based learning media is at low = 16%, moderate = 62%, and high = 22%. Mean of that score take place at moderate level.

3.2.2 Creating ICT-based Learning Media

The instrument survey to describe teacher competence in planning ICT has ten statement items as in the table 8.

Table 8. Mean and standard deviation of teachers' competence in creating ICT

Dimension	Level		
	High	Moderate	Low
I ever study creating ICT for teaching (join workshop, course, or lectures)	13	32	5
I can operate design graphics application, such as Photoshop, Corel draw, etc.	7	37	6
I can operate aplication of recording voice, recording video, editing voice, and editing video (i.e. Movie Maker, Camtasia, Ulead Video Studio, Sony Vegas, etc.)	6	40	4
I can create ICT media using MS. Power point application.	11	34	5
I can create ICT media using software such as Macromedia flash Professional 8, or Adobe Flash, or Auto play	5	39	6
I create ICT independently	7	36	7
I just edit available media	6	37	7
I know the ICT development principles	5	37	8
I try media to user to be, expert media, per se, before use it	6	38	6
I fix media immediately when the media cannot work	8	37	5

The table 8 above shows that teachers' competence about creating ICT-based learning media is at moderate level. Some Elementary School teachers are confident to operate ICT sofware and hardware. Such as Photoshop, Corel Draw, Camtasia, Editing Video, Sound Recorder, Powerpoint, Adobe Flash, ect. Comparing between item directed that some of teachers have low ability in editing media, operate aplication as Corel Draw,

Photosop, Movie Maker, Macromedia Flash 8 and Adobe Flash.

The teachers knowledge about principles of creating ICT are lower than the other. Such as: (1) Visible: easy viewing, (2) Interesting, (3) Simple, (4) Useful for students or users, and (5) Accurate: true and on target, (6) Legitimate: legitimate and reasonable, (7) Structured: well structured, and (8) coherent.

The teachers also have not tried ICT product to users to be or expert ICT or per se before using ICT in their class. Items of ICT instruments in creating ICT is in accordance with the theory Aqib about principles used in the creating and using instructional media. So that, the teachers have to increase their ability in mastering software and hardware of computer.

Table 9. Frequency and percentage of teachers' competence in creating ICT

Level of Teachers' Planning	Categorization Level	Range of Value	Frequency	Percentage
Low	$x<(\mu-1.0\sigma)$	$x<1.78$	10	20%
Moderate	$(\mu-1.0\sigma)\leq x\leq(\mu+1.0\sigma)$	$1.78\leq x\leq 3.24$	34	68%
High	$(\mu+1.0\sigma)<x$	$3.24<x$	6	12%
Total			50	100.0

The table 9 above shows that the competence of teachers in creating ICT-based learning media is at low = 20%, moderate = 68%, and high = 12%. Mean of that score take place at moderate level.

3.2.3 Using ICT-based Learning Media

The instrument survey to describe teacher competence in planning ICT has ten statement items as in the table x.

Table 10. Mean and standard deviation of teachers' competence in using ICT

Dimension	Level		
	High	Moderate	Low
The school facilitation support to integrate ICT, such as Laptop/computer, LCD, Projector, internet, Computer Lab, etc	4	41	5
My School, has enough ICT media collections	14	31	5
I use ICT media (i.e. Learning CD, MS. PowerPoint, Video, Internet, etc.) when teaching	4	36	10
I use ICT to solve misunderstanding of subjects content	2	37	11
I use ICT to describe abstract subjects content	17	27	6
I use ICT to simulate content	2	39	9
I use ICT to exercise	14	22	14
I use available ICT (from internet, government, etc) when teaching	12	27	11
I use ICT which is created by myself in teaching	11	26	13
I interest to create and use ICT in teaching	6	35	9

The table 10 above shows that teachers' competence about using ICT is in moderate level. This instrument is relevant with Aktaruzzaman theory about the roles of ICT in education (Aktaruzzaman, 2011). The table above shows that the teachers' competence in using ICT created by themselves take lower level than the other. This is consistent with the low competence of teachers to operate a computer program for learning.

Table 11. Frequency and percentage of teachers' using level

Level of Teachers' Planning	Categorization Level	Range of Value	Frequency	Percentage
Low	$x<(\mu-1.0\sigma)$	x<2.59	6	12%
Moderate	$(\mu-1.0\sigma)\leq x\leq(\mu+1.0\sigma)$	2.59≤x≤3.80	36	72%
High	$(\mu+1.0\sigma)<x$	3.80<x	8	16%
Total			50	100.0

The table 10 above shows that the competence of teachers in using ICT is at low = 12%, moderate = 72%, and high = 16%. Mean of that score take place at moderate level. The comparison between the teachers' competence to plan, create and use of ICT shows that most of teachers in elementary school have an interest to use ICT in teaching and learning. However, some teachers become often lazy to use the technology. Because of that, existing technology is just left unused. Therefore, a important program to do ICT media development training based on the needs, principle and backgrounds of teachers' competencies.

3.3 Relationship between Activity Planning, Creating, and using of ICT-based Learning Media

The relationship between planning, creating, and using ICT-based learning media in Elementary school teachers can be known from the value of the correlation coefficient as indicated in the table xii.

Table 12. The coefficient correlation among planning, creating, and using ICT

	Planning	Creating	Using
Planning	1	0,96	0,89
Creating	0,96	1	0,87

Table 12 shows that: (1) the level of the teacher's skill to plan ICT-based learning media is related to the teacher's skill to create ICT-based learning media, namely the coefficient value is 0.96, (2) the teacher's skill to plan ICT-based learning media is related to the teacher's skill to use ICT-based learning media, namely the coefficient is 0.89, and (3) the level of teacher's skill to create ICT-based media is related to the teacher's skill to use ICT-based learning media, namely the coefficient is 0.87. The way to give an interpretation of the correlation coefficient value is by referring to the empirical guilford rule as shown in the table xiii.

Table 13. The coefficient correlation among planning, creating, and using ict

Level of R_{YX}	**Interpretation of relationship level**
0,00 – < 0,20	Very weak
≥ 0,20 – < 0,40	Low or weak
≥ 0,40 – < 0,70	Moderate
≥ 0,70 – < 0,90	Strong
≥ 0,90 – ≤ 1,00	Very strong

Based on the table above, it is known that the relationship among elements studied has a positive and very strong relationship. It means that the teachers' skill in planning ICT-based learning media interact positively with their skills to create, and use ICT-based learning media..

4 CONCLUSIONS

The teachers' skill in planning, creating and using ICT-based learning media requires to be more creative. This study found some important teachers' competencies to be improved, which is as follows:

1. The finding was that the majority of the respondents had moderate level of Planning (M= 3,46, SD= 0,62), Creating (M= 2,51, SD= 0.73), and Using (M= 3,19, SD= 0,60). This study shows that the teachers' skills in creating are lower than planning ICT-based learning media, and the teachers' skills in using are lower than planning ICT-based learning media.
2. The teachers' skills in planning correlated with the teachers' skills in creating (ryx = 0.96), and using (ryx = 0.89). The teachers' skill in creating correlated with the teachers' skill in using (ryx = 0.87).

3. 3. The teachers' skills that are lowest is mastery of computer software, such as: editing video, audio, powerpoint and macromedia flash 8.
4. The teachers' knowledge of the principles of ICT development is still relatively low.
5. Some factors affecting elementary teachers' decision to not use ICT are because uncomfortable feeling, and there are problems with ICT devices
6. The teachers are interested to study basic and medium software, such as powerpoint, adobe flash, editing picture, video, sound, animation, web and the other.

Some findings above showed that teacher need workshop activies about planning, creating, and using ICT-based learning media. Moreover, the headmaster have to motivate and give a awards to outstanding teachers. Finally, teachers have to improve their ICT skills to advance the future of education.

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