Level of ICT literacy: The ability of elementary school teachers to use ICT investigation in Cimahi

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Abstract. This study aims to analyze the level of information and communication technology (ICT) literacy of elementary school teachers and determine the level of ICT literacy of elementary school teachers grouped by: gender and age. The number of participants in this study were 345 respondents spread across 3 sub-districts. The method used is a descriptive quantitative approach with data collection techniques using a questionnaire. Research shows that the level of ICT literacy of elementary school teachers is at level 2 of 6 levels, where teachers have repeatedly used ICTs to help with daily activities and have a pattern of repetition in their use. Based on gender and age, there was no significant difference between the ability of male and female teachers. Then when viewed by age shows a significant value between younger teachers and older teachers. Where the younger teacher's age has the higher level of ICT ability.

1. Introduction

The development of Information and Communication Technology (ICT) has affected human life in various aspects. ICTs have an important role in every human activity in various aspects of life because ICT devices continue to develop and their use has expanded to all formal and non-formal sectors. With the development of ICT, it should be easy for teachers to get or find various learning resources to improve their knowledge in order to create a learning environment that is modern and acceptable to students. ICTs have played many roles in improving the quality of human civilization, especially in relation to life activities in the field of information and communication technology in education [1]. The role of ICT both physically and non-physically is a necessity and demands to be able to improve the level of education throughout the world, especially education in Indonesia.

The involvement of ICT in education is a demand of 21st century learning, where the term “21st century learning” is that teachers must have the ability and positive attitude towards the use of ICT equipment for teaching and learning. Integration of ICT in learning not only provides changes to the teacher's role in the classroom, but also makes the learning environment more dynamic where students can be more directed and motivated to learn [2].

The success of integrating ICT in learning in schools depends on the ability and attitude of the teacher in using and integrating ICT in learning. Therefore, the 21st century learning feature requires teachers,
one of them is elementary school teachers to have the ability in ICT. The basic problem is whether the teacher knows or not about how to use ICT in learning effectively [3].

Based on previous research that examined the ability of elementary school teachers to use ICT in learning, it was found that the low level of ability of elementary school teachers to use ICT in Korea [4]. However, the demands of 21st century education require teachers to be able to use ICT equipment, especially integrating it in learning. In addition, the demands faced by teachers now lead students to use ICT in a more positive direction. Nowadays, elementary school students know about ICT, such as using smartphones and computers. Even in learning, students are more interested in seeing learning in the form of PowerPoint presentations or viewing learning videos that are displayed on projectors, listening to music from I-pods, mobile phones, smartphones and others. While teachers still often use conventional learning because teachers are still very limited in ICT literacy skills [5].

The purpose of this study was to determine the level of ICT literacy of elementary school teachers in Cimahi city and find out the differences in the level of literacy of ICT teachers viewed by gender and age.

2. Method
This study uses a survey method with a descriptive quantitative approach [6]. Participants involved in this study were state elementary school teachers in Cimahi city. The population used in this study were elementary school teachers in Cimahi City who were randomly drawn from 3 existing sub-districts, with a population of 1757 teachers. Then the number of samples taken in this study were 345 teachers determined using the Issac and Michuel formula [7].

Data collection techniques in this study used a questionnaire, with indicators measured referring to the area of ICT literacy. Likert scale is used to measure the teacher's ability to use ICT with alternative answers Never = 1, Ever = 2, Often = 3, and Very Often = 4.

One model for measuring the literacy level of ICTs in the community is usually used by the Personal Capability Matuarity Model (P-CMM). Therefore, the Ministry of Communication and Information of the Republic of Indonesia provides a level of ICT literacy as presented in table 1 [8]:

| Level | Description |
|-------|-------------|
| 0     | If an individual does not know at all and does not care about the importance of ICT for life |
| 1     | If an individual has had one or two experiences, where information is an important component for achieving desire and solving problems, and has involved information technology to look for it. |
| 2     | If an individual has repeatedly used technology to help with daily activities and has a pattern of repetition in its use. |
| 3     | If an individual has a standard of mastery and understanding of information and technology that is needed, and consistently uses these standards as a reference for carrying out daily activities |
| 4     | If an individual has been able to improve significantly (can be stated quantitatively) the performance of daily life activities through the use of information technology. |
| 5     | If an individual has considered information and technology as an inseparable part of daily activities, and directly or indirectly has influenced his behavior and culture of life (part of information society) |

3. Results and discussion
3.1. Results of data collecting
The results of data collection conducted by distributing questionnaires, collected as many as 345 respondents spread across 3 sub-districts. The percentage of data is grouped by age and gender which can be seen in table 2.
Table 2. Percentage of respondents data.

| No | Sub district     | Total respondent | Gender | Age     |            |            |            |            |            |            |
|----|------------------|------------------|--------|---------|------------|------------|------------|------------|------------|------------|
|    |                  |                  | Male   | 21-25 years | 26-35 years | 36-45 years | 46-55 years | 56-62 years |            |            |
| 1  | North Cimahi     | 105              | 35     | 10.1%   | 70         | 20.3%      | 5           | 1.4%       | 25         | 7.2%       |
|    |                  |                  | Female | 26-35 years | 36-45 years | 46-55 years | 56-62 years |            |            |            |
| 2  | Central Cimahi   | 166              | 38     | 11.0%   | 128        | 37.1%      | 9           | 2.6%       | 31         | 9.0%       |
|    |                  |                  |        |         |            |            |            |            | 20         | 5.8%       |
| 3  | South Cimahi     | 74               | 14     | 4.1%    | 60         | 17.4%      | 5           | 1.4%       | 21         | 6.1%       |
|    |                  |                  |        |         |            |            |            |            | 16         | 4.6%       |
|    |                  |                  |        |         |            |            |            |            | 23         | 6.7%       |
|    |                  |                  |        |         |            |            |            |            | 9          | 2.6%       |
|    | Total            | 345              | 87     | 25%     | 258        | 75%        | 19          | 6%         | 77         | 22%        |
|    |                  |                  |        |         |            |            |            |            | 63         | 18%        |
|    |                  |                  |        |         |            |            |            |            | 135        | 39%        |
|    |                  |                  |        |         |            |            |            |            | 21         | 15%        |

Table 2 shows that the highest number of respondents is in Central Cimahi Subdistrict, there are differences in the number of respondents from each sub-district due to the uneven number of teachers in each school. Furthermore, the number of respondents was grouped by gender and age. From the results of data collection obtained that respondents aged from 21-62 years. Looking at the results of the percentage obtained, the majority of respondents were aged 46-55 years. The number of respondents is dominated by female which reached three-quarters of the total number of respondents.

3.2. Data processing results

3.2.1. The ability of teachers to use ICT. The findings of the teacher's ability to use ICT consisting of 11 questions. It can be seen in table 3.

Table 3. Percentage of teacher's ability to use ICT.

| No | Statement                                                                 | Value (%) |
|----|---------------------------------------------------------------------------|-----------|
| 1  | Use a computer (keyboard, mouse, monitor, CPU)                            | 68        |
| 2  | Print documents using printer.                                            | 69        |
| 3  | Use a projector to display teaching material                              | 50        |
| 4  | Save or transfer files using a flashdisk                                   | 70        |
| 5  | Typing using Microsoft Word                                               | 70        |
| 6  | Use the Microsoft PowerPoint application                                  | 55        |
| 7  | Use the Microsoft Excel application to process data.                      | 63        |
| 8  | Use mobile phones to communicate via SMS and call.                        | 84        |
| 9  | Search for information using a web browser (google chrome, mozilla firefox, | 73        |
|    | internet explorer)                                                       |           |
| 10 | Download files to a computer                                              | 65        |
| 11 | Using social media (Facebook, Whatsapp, BBM, Line) to communicate with    | 79        |
|    | other people                                                             |           |
|    | Mean                                                                      | 67.81     |

Table 3 shows the percentage value of each statement. The highest percentage of ability level is a statement regarding the use of mobile phones to communicate via SMS and call and the use of social media to communicate with others. Furthermore, almost all statements in this variable are in the medium category such as the ability to find information using a web browser (google chrome, Mozilla Firefox, internet explorer), the ability to use Microsoft Excel applications to process data, the ability to save or transfer files using flash disks, the ability to type using Microsoft Word, the ability to use a computer (keyboard, mouse, monitor, CPU), the ability to download files to a computer, the ability to print documents using a printer and use Microsoft PowerPoint applications. Then the statement of the ability to use projectors to display teaching material is in the low category.

Referring to the Personal Capability Matuarity Model of the teacher's ability to use ICT, the average value of 67.81% is at level 2. Level 2 means that Elementary School teachers have repeatedly used technology to help with daily activities and has a pattern of repetition in its use. The highest percentage value statement was seen regarding the ability of teachers to use mobile phones to communicate via
SMS and call, because the use of this device is very easy, cheap, economical and can minimize risks for users so that many people master using this device [9]. While the lowest percentage value is found in the statement of the ability of teachers to use projectors to display teaching materials, even though learning using projectors can make learning materials more visual and learning activities can be more active and innovative.

3.2.2. The ability of teachers to use ICT based on gender and age. After knowing the level of the teacher's ability to use ICT, researcher wanted to find out more about the differences in the ability to use ICT in elementary school teachers based on gender and age. The results can be seen in tables 4 and 5.

Table 4. Percentage of teacher's ability to use ICT by gender.

| Gender | Value (%) |
|--------|-----------|
| Male   | 69.35     |
| Female | 67.38     |

Table 4 shows that the level of ICT literacy of elementary school teachers that is grouped by gender is different in percentage values, but the difference is not so high. The level of ICT literacy of male teachers is higher than female teachers, this is because when male teachers find new media, they will be more enthusiastic in understanding it, and their attitudes will be more positive towards the media. Whereas female teachers need more time to understand new media and also take longer for female teachers to be more positive about computers and the internet [10]. So that female teachers tend to be more anxious, less experienced and less confident in their ICT competencies compared to male teachers [11].

Table 5. Percentage of teachers ability to use ICT based on age.

| Range of age | Value (%) |
|--------------|-----------|
| 21-25 years  | 76.67     |
| 26-35 years  | 74.62     |
| 36-45 years  | 72.84     |
| 46-55 years  | 64.53     |
| 56-62 years  | 57.26     |

Table 5 shows the value of teacher ICT literacy rates grouped by age. Respondents in this study ranged in age from 21 years to 62 years, divided into 5 age groups, with the highest percentage in the age range of 21-25 years, then 26-45 years and 36-45 years. However, there was a significant decrease in the age group 46-55 years and 56-62 years. This shows that the level of teacher literacy towards ICT is inversely proportional to his age. The older a person is, the lower the level of his ICT abilities, and the younger the age of a person is, the higher the level of his ICT abilities. Younger teachers explore more while older teachers are less open to technology and tend to prefer old ways [12,13].

4. Conclusion

Based on the findings and discussion, it can be concluded, that the level of literacy of elementary school teachers in Cimahi City in using ICT is at the level 2 of 6. It can be stated quantitatively at 67.81%. Level 2 means that the teacher has repeatedly used technology to help with daily activities and has a pattern of repetition in its use, referring to the Ministry of Communication and Information of the Republic of Indonesia. Whereas if reviewed by gender, there is no significant difference between the ability of male and female teachers. Then when viewed by age shows a significant value between younger teachers and older teachers. The younger the teacher's age, the higher the level of ICT ability.
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