ICT competency Profile of Student

by Salmilah Salmilah

ICT Competency Profile of Students Teachers Education Program Based on ICT Competency Framework for Teacher (ICT-CFT)

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Abstract: This study aims to determine the profile of students' ICT competency in teacher training programs at the Faculty of Tarbiyah and Teacher Training IAIN Palopo based on ICT Competency Framework For Teachers (ICT-CFT) issued by UNESCO. The research approach used in this study is a quantitative approach using descriptive analysis. Data collection using a questionnaire with 83 respondents consisting of 7 semester students of IAIN Palopo FTIK from 5 Study Programs. The results of the study indicate that the ICT competency of students of teacher training programs at IAIN Palopo based on ICT-CFT competency standards is still largely in the sufficient and lacking categories at the level of technological literacy, knowledge deepening and knowledge creation. The results of this research are expected to be taken into consideration by institutions as a basis for developing both curriculums related to ICT competencies, procurement of resources and supporting infrastructure that can improve ICT competency in teacher training programs especially in FTIK IAIN Palopo.

Keywords: *ICT Competence, Teacher Study Program Students, ICT-CFT*

I. INTRODUCTION

The development of education can not be separated from the development of information and communication technology. Some aspects of education have even depended on technology, the world is becoming increasingly narrow without space and time. Dissemination of information can take place in a short time and extensive network. Information and communication technology (ICT) acts as a means to collect, store, process and disseminate information and knowledge in various forms and ways. The information and knowledge is disseminated in the form of text, images, graphics, sound, animation and video or a combination of all (multimedia) to various targets interactively through the instranet network and the Internet.

The Indonesian Ministry of Education and Culture has placed ICT as one of the main supporters of the availability of education services. The provision of competent teaching staff that is evenly distributed throughout Indonesia has been declared as one of the strategic objectives in the administration of national

education. Providing educators who master ICT competencies is an urgent need for the achievement of these goals. Teachers who are competent in the use of ICT are needed to develop personal, pedagogical, social and professional competencies in accordance with Indonesian Minister of National Education Regulation No. 16 2007 concerning Teacher Competencies.

In a study conducted byTasir, et al (2012) entitled Relationship Between Teacher's ICT Competency, Confidence Level and Satisfaction Toward ICT Training Programs : A Case Study Among Postgraduate Students, explained that there was a relationship between teacher ICT competencies with confidence in managing learning and the relationship between the ability of ICT teachers with satisfaction obtained in ICT training. This shows that the level of ICT teacher competence is influenced by the ICT competency development model that is followed and the ability of the teacher's ICT can increase teacher confidence in managing learning.

Other research related to teacher ICT competency levels was also conducted byMarcial, et al (2015)entitled ICT Competency Level of Teacher Education Professionals in the Central Visayas Region, Philippines. This study uses the ICT-CFT standard from UNESCO to measure the level of teacher competence in an area in the Philippines and shows the results that the level of ICT competence of teachers in the area under study is at the level of knowledge deepening and is needed to increase the level of competence to achieve a more innovative learning process .

Once the importance of ICT competencies for teachers so that UNESCO issued an ICT competency framework that became a reference for mastery of ICT for teachers, the framework is known as ICT-CFT (ICT-Competency Framework For Teachers).

This problem reminds us to review the process of learning and education of prospective teachers conducted by the Institute of Educators of Education Personnel (LPTK) which, according to Semiawan and Natawijaya in (Musfah, 2011), "Actually produces teachers who have pedagogical, professional, social and personality competencies". Dr. Totok Bintoro, M.Pd, one of the Teacher Professional Education Development Team (PPG) Directorate General of Learning and Student Affairs of Kemenristekdikti in the socialization of Permen Ristekdikti Number 55 Year 2017 concerning Teacher Education Standards said that superior / quality generation was produced by education with teachers who superior / quality, superior and quality teachers produced from quality teacher education (quality LPTK), further said that the new teacher education curriculum refers to how to produce teachers who are able to realize national educational goals, patriotic and have strong character, have superior potential, have insight ahead and have ICT competencies.

The role of higher education as a competent provider of alumni in their fields is one of the efforts to improve the quality of education, therefore teacher candidates who mostly study in teacher training programs should be equipped with knowledge and skills related to ICT competencies that are in accordance with the standards of needs in the field so that they as alumni of teacher training programs have ICT competencies that are reliable and ready to use. One of the tertiary institutions that manages teacher study programs is IAIN Palopo which currently manages the Faculty of Tarbiyah and Teacher Training (FTIK) which consists of 7 (Seven) Study Programs namely Islamic Religious Education, Mathematics

Education, Arabic Education, English Education, Educational Management, Primary Teacher Education, and Early Childhood Islamic Education.

To support the achievement of ICT competencies for alumni who will become prospective teachers, FTIK IAIN Palopo in its curriculum prepares a course on ICT mastery which is presented in one semester and becomes one of the compulsory courses in all majors in FTIK IAIN Palopo. In order to develop curriculum and improve the quality of alumni, it is necessary to know the extent of ICT competencies that have been possessed by FTIK IAIN Palopo students based on the Teacher ICT competency framework (ICT-CFT) that should be owned by a teacher. The things mentioned above are encouraging researchers to conduct this research. with the hope that the results of this research can be taken into consideration in the development of curriculum, methods and teaching materials for courses related to the improvement of ICT competencies in teacher training students.

II.   LITERATURE REVIEW

A. Information and Communication Technology (ICT)

Information and Communication Technology, is a large umbrella terminology that includes all technical equipment for processing and delivering information. ICT covers two aspects, namely information technology and communication technology. Information technology includes all matters relating to the process, use as a tool, manipulation, and management of information.While communication technology is everything related to the use of tools to process and transfer data from one device to another. Therefore, information technology and communication technology are two inseparable concepts. So Information and Communication Technology contains a broad understanding that is all activities related to processing, manipulation, management, transfer of information between media.

The term ICT emerged after the combination of computer technology (both hardware and software) and communication technology in the mid-20th century. The combination of the two technologies is developing rapidly beyond other fields of technology. Until the beginning of the 21st century, ICTs continue to undergo various changes and have not seen a saturation point (https://id.wikipedia.org).

B. Teacher ICT Competencies

(Munir, 2009) in the ICT-Based Curriculum book, said that the presence of ICT in education can be interpreted in three paradigms, namely (1) ICT as a tool or in the form of technology products that can be used in education, (2) ICT as content or as part of material which can be used as content in education, and (3) ICT as an application program or learning aid and effective and efficient management. The three paradigms are synergized in an ICT competency that should be owned by a teacher. Among the ICT competencies that must be possessed by teachers, are:

a. Know, master and understand the ICT curriculum;
b. Knowing and proficient in computer operations and other supporting ICT devices;
c. Having the ability to choose teaching software;
d. Knowing the techniques of teaching using computers;

e.   Have an understanding of ethics, laws and safety regulations;
f.   Sensitive to the latest technology in the world of education.

C. UNESCO's ICT Competency Framework For Teacher (ICT-CFT)

The use of ICT in education provides a new professional role for teachers, new pedagogies and new approaches in teacher training. The successful integration of ICT in the classroom will depend on the ability of the teacher, in: (i) the structure of the learning environment in new ways, namely to combine ICT with new pedagogy, and (ii) develop active social classes that encourage cooperative interaction, collaborative learning and work group. This requires a different set of classroom management skills than usual.(Munir, 2014)

UNESCO in collaboration with CISCO, Intel, and Microsoft, as well as education experts conducted intensive consultations to identify the ICT competencies of teachers they have in order to master the material and class effectively and efficiently. The collaboration resulted in three UNESCO framework books on ICT competencies for professional teachers published in 2008, namely : (i) Policy Framework that explains the reasons, structure and approach of ICT-CFT (ICT Competency Framework for Teachers) activities, (ii) Competency Framework development module that can explain how the three stages of educational development can be mapped against the six aspects of a teacher's work to create a framework of teacher competency modules, and (iii) Implementation Guidelines provided specifically and in detail for each module in educational development.

To implement the aspects of ICT-based professional teacher work mentioned above is carried out through three ICT-CFT (ICT Competency Framework for Teachers Project) approaches issued by UNESCO on teaching based on human ability in mastering technological development, namely: 1. Technology literacy , 2. Knowledge Deepening, and 3. knowledge Creation. (Munir, 2014)
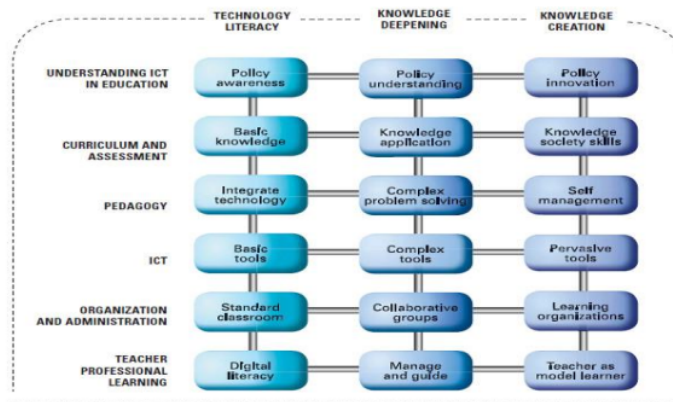

Figure 1. ICT-CFT UNESCO

III.   RESEARCH METHODS

The approach used in this research is a quantitative approach using descriptive analysis. This approach is used to obtain an overview of ICT Competency Frofiles

of Students Teacher Program at IAIN Palopo based on ICT competency framework for teacher (CT-CFT). This research variable is defined based on the teacher ICT competency framework issued by UNESCO namely ICT-CFT which consists of 6 competency aspects divided into 3 levels / levels namely technology Literacy, Knowledge Deepening and Knowledge Creation with variable indicators including: Understanding ICT in Education, Curriculum and Assessment, Pedagogy, ICT, Administration and Organization, Teacher Professionalism Learning.

The population in this study were all 7 (Seven) semester students at the FTIK IAIN Palopo, the reason for choosing the 7th semester students was that they would take part in the PPL (Field Experience Practice) program at schools to practice the knowledge and theories that had been obtained during lectures on campus so it is necessary to know what ICT competencies they have whether they are in accordance with the ICT competency standards that should be possessed by a teacher, in addition it can also be a material for decision makers to improve the quality of graduates. FTIK IAIN Palopo consists of 7 (Majors) but only 5 majors will be made into population because the other two majors do not have students who are in semester 7. The population in this study can be seen in the following table:

Table I. Research Population

No	Majors	Amount
1	Islamic Religious Education	96
2	Mathematics Education	106
3	English Education	134
4	Arabic Education	30
5	Primary Teacher Education	66
	Σ	432

Determination of the number of samples using the Simple Random Sampling technique with the Slovin formula, namely:

$$n = \frac{N}{1 + Ne^2}$$

Based on this formula the number of samples was 83 people. The sampling technique used Multistage Random Sampling (Proportional Balanced and Random) because to represent a large enough population. Whereas to determine the number of samples from each subpopulation the formula isused:

$$n = \frac{Ni}{N} \, x \, n$$

Then the sample distribution is obtained as follows:

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Table II. Research Samples

No	Majors	Amount
1	Islamic Religious Education	18
2	Mathematic Education	20
3	English Education	26
4	Arabic Education	6
5	Primary Teacher Education	13
	Σ	83

The data analysis technique used to determine the ICT competency profile of these students uses descriptive analysis techniques in the form of percentages. To draw conclusions, the results of the percentage analysis are converted to the Benchmark Reference Rating (PAP) category, as follows:

0% - 20%   : Very Poor (VP)
21% - 40%   : Less (L)
41% - 60%   : Sufficient (S)
61% - 80%   : Good (G)
81% - 100% : Very Good (VG)

IV.   RESULTS AND DISCUSSION

A. Technology Literacy Level

Technology literacy is the first level in the ICT ICT competency framework (ICT-CFT). This level focuses on developing teacher technology literacy to integrate ICT into the curriculum. This stage requires a focus on equitable distribution to enable expansion of access that reduces digital divide (digital divide) The end result of this literacy phase is that teachers are competent in utilizing ICT in learning to empower students to be able to master new technology as a provision for students to develop themselves as lifelong learner. The results of the analysis of ICT competency data for ICT-CFT-based teacher study programs at the level of technological literacy can be seen in the following table:

Table III. Presentation of Student ICT CompetenciesICT CFT - Based Technology Literacy Level

Competency Aspects	Percentage				
	Very Good	Good	Sufficient	Less	Very Poor
ICT Policy in Education	0%	1,20%	46,40%	45,20%	7,20%
Curriculum and Assessment	0%	0%	48%	48%	4%
Pedagogic	0%	2%	54%	39%	5%
Information and communication technology	0%	6,80%	44%	46,60%	2,60%
Administration	0%	1%	50%	41%	8%
Teacher Professionalism	0%	3%	53,60%	38,60%	4,80%

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Average	0%	2%	49%	43%	5%

These results indicate that the level of ICT competence of ICT-CFT-based teacher study programs for the highest level of technological literacy is at the Fair and Poor levels. In terms of competency, the highest score is in the pedagogical aspect, which is 54% and the lowest in the administrative aspect, which is 1%. An overview of student ICT competencies can be seen in the following graph:
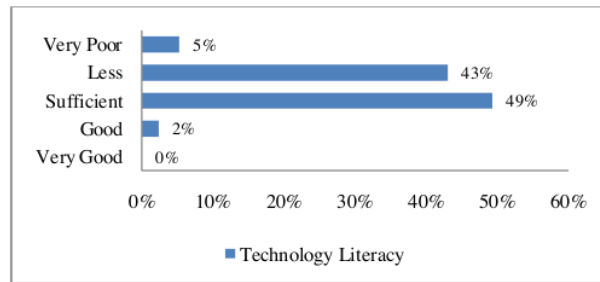

Figure 2. Presentation of Student ICT Competencies Based Technology Literacy Level

Based on the result of data analysis at the level of technological literacy, the results obtained were in the very good category with an average value of 0%, the good category was 2% on average, the category was quite average 49%, the category was less than the average was 43% and the category was very poor. an average of 5%.

B. Knowledge Deepening

These competencies are deeper and have more impact on learning. Deepening knowledge requires students as actors to apply knowledge in order to improve complex problem-solving skills in the work environment. The competency in the knowledge deepening stage aims to enable teachers to use ICT in learning to empower students so that they are able to apply knowledge from the subjects they receive to solve complex problems they face in the work environment and society. The results of the questionnaire data analysis for this stage are based on 6 (six) competency aspects in the ICT CFT framework, the following results were obtained:

Table IV. Presentation of Student ICT CompetenciesCFT ICT Based Knowledge Deepening Level

Competency Aspects	Percentage				
	Very Good	Good	Sufficient	Less	Very Poor
ICT Policy in Education	0%	0%	40%	54%	6%
Curriculum and Assessment	0%	0,60%	38%	54,80%	6,60%
Pedagogic	0%	6%	58%	32%	4%
Information and	0%	8%	46%	39%	7%

communication technology					
Administration	0%	7,23%	32,53%	50,60%	9,64%
Teacher Professionalism	0%	0%	45%	47%	8%
Average	0%	4%	43%	46%	7%

The results above show that the ICT-CFT-based students' ICT competency level for the highest level of deepening knowledge is at the Enough level. In terms of competency, the highest score was in the pedagogical aspect, namely 58% and the lowest was in the aspect of ICT Policy in Education and the aspect of teacher professionalism, namely 0%. An overview of student ICT competencies can be seen in the following graph:
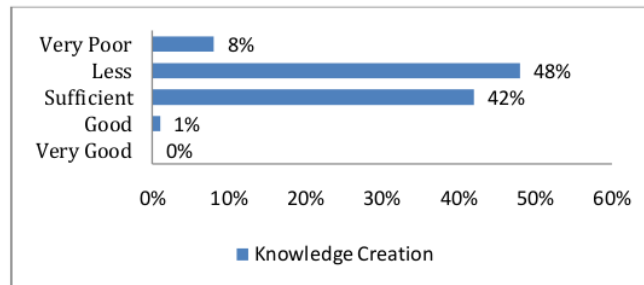

Figure 3. Presentation of ICT Competence of FTIK Students at IAIN Palopo ICT-based CFT Knowledge Deepening Level

Based on the results of data analysis at the deepening level of knowledge, the results were in the very good category with an average value of 0%, the good category with an average of 4%, the average category enough for 43%, the less category average 46% and the very poor category. an average of 7%.

C. Knowledge Creation

This competency is the most complex because it involves involved educational actors and can benefit from the process of knowledge creation, innovation, and participation in lifelong learning. Teachers can model these skills to their students through their own experienced professional development, here teachers can develop more complex skills in using technology and collaborative skills with colleagues to design challenging project-based learning for students. The results of the questionnaire data analysis for this stage are based on 6 (six) competency aspects in the ICT CFT framework, the following results wereobtained:

Table V. Presentation of Student ICT CompetenciesCFT ICT-Based on Knowledge Creation Level

Competency Aspects	Percentage				
	Very Good	Good	Sufficient	Less	Very Poor
ICT Policy in Education	0%	0%	53%	42%	5%
Curriculum and Assessment	0%	0%	48,20%	43,40%	8,40%
Pedagogic	0%	2,40%	39,80%	55,40%	2,40%

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Information and communication technology	0%	5%	36%	58%	1%
Administration	0%	0%	50,60%	44,60%	4,80%
Teacher Professionalism	0%	0%	26,50%	47%	26,50%
Average	0%	1%	42%	48%	8%

The results above show that the ICT-CFT-based students' ICT competency level for the highest level of knowledge creation is at the Less level. In terms of competency aspects, the highest score was in the pedagogical aspect, namely 55.40% and the lowest was in the aspects of ICT Policy in Education, aspects of curriculum and assessment, aspects of administration and aspects of teacher professionalism, namely 0%. An overview of student ICT competencies can be seen in the following graph:
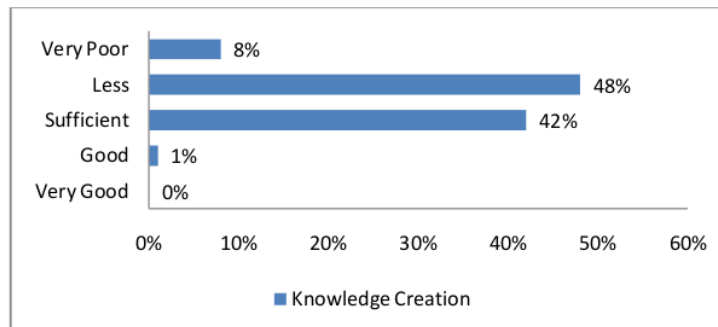

Figure 4. Presentation the ICT Competence of FTIK Students at IAIN Palopo ICT-CFT based on Knowledge Creation Level

Based on the results of data analysis at the level of knowledge creation, the results were in the very good category with an average value of 0%, the good category with an average of 1%, the average category enough for 42%, the less category average 48% and the very poor category an average of 8%. From the results of data analysis at the deepening level of knowledge, the highest value was in the ICT aspect in the less category, namely 58%. Likewise, at the next level, namely knowledge creation where teachers are expected to develop more complex skills in using technology and collaborative skills with colleagues to design challenging project-based learning for students. For the level of knowledge creation, the highest score was obtained in the pedagogic aspect of 58% in the sufficient category.

D. Discussion

The ICT competency framework based on the ICT-CFT standard is an ICT competency framework for teachers issued by UNESCO to be used as a reference or standard for how ICT competencies should be possessed by a teacher. This competency framework consists of 6 competency aspects, namely: 1) ICT Policy in education, 2) Curriculum and Assessment, 3) Pedagogy, 4) ICT, 5) Administration and 6) Teacher Professionalism, these six aspects are then divided into 3 levels, namely technological literacy, deepening of knowledge and

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knowledge creation. This ICT-CFT competency standard is used in this study were to measure the ICT competencies possessed by students of the teacher study program at the IAIN Palopo FTIK in the context of developing curriculum, learning tools and other supporting resources such as human resource support (ICT lecturers) and ICT learning infrastructure.

The readiness of students at the level of technological literacy will affect at the next level, namely deepening of knowledge where teachers are expected to be able to use ICT in learning to empower students so that they are able to apply knowledge from the subjects they receive to solve complex problems they face in the work environment and society. and furthermore, at the level of knowledge creation where a teacher is expected to have the ability to use ICT to encourage students to increase productivity by always being involved in knowledge creation and innovation. This competency is the most complex because it involves involved educational actors and can benefit from the process of knowledge creation, innovation, and participation in lifelong learning. Curriculum changes are expected to improve collaboration, communication, creative thinking, innovation and critical thinking skills. Teachers can model these skills to their students through their own professional development. Here the teacher can develop more complex skills in the use of technology and collaborative skills with colleagues to design challenging project-based learning for students.

The results showed that the dominant ICT competency in teacher study program students was still in the moderate and low categories. This is a material consideration for FTIK IAIN Palopo as one of the LPTKs (Educational Personnel Educators) to carry out curriculum development, learning tools and infrastructure that support the implementation of learning that supports the improvement of ICT competences for future teacher-candidate students. In accordance with the Ministry of Research and Technology Regulation Number 55 of 2017 concerning Teacher Education Standards that the superior / quality generation is produced by education with superior / quality teachers, superior and quality teachers are produced from quality teacher education (quality LPTK), further conveyed that the new curriculum for teacher education refers to how to produce teachers who are able to realize the goals of national education, are patriotic and have strong character, have superior potential, have future insight and have ICT competencies.

(Marcial et al., 2014), with a study entitled ICT Skills Enhancement Training in Teacher Education: The Case in Central Visayas, Philippines. Suggesting that the use of ICTs in education provides effective pedagogical benefits, so a training program for ICT skills enhancement to improve skill and operations and ICT concepts using national and international standards for teacher education. The role of the Teacher Education Institution greatly influences the competencies possessed by teacher education graduates. Applying the right curriculum and following the needs of the development of the era of information technology will produce educators who have the appropriate competence.

V.   CONCLUSION

The results showed that in general the ICT competence of the IAIN Palopo FTIK students based on the ICT-CFT competency framework was still dominant in the sufficient and insufficient category. The results of this study are expected to be taken into consideration for managers to prepare resources that can help such

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as curriculum development, practicum resources and support for the application of ICT among students so that they can improve students' ICT competence.

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