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## Technological content knowledge of history teachers in Jember

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## Technological content knowledge of history teachers in Jember

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**Abstract.** Based on the Regulation of the Minister of Education and Culture of the Republic of Indonesia Number 22 of 2016 concerning Basic and Secondary Education Process Standards that the learning process can be carried out by utilizing information and communication technology to improve the efficiency and effectiveness of learning. In accordance with the era of industrial revolution and increasingly sophisticated technological developments, requires that educators can integrate technology with the content of learning materials. The results of previous studies indicate that most teachers in Jember Regency are considered not creative, only 30 percent of teachers are creative and literate in information technology and as many as 70 percent of teachers are not creative, they still teach with conventional techniques, without using information technology. The purpose of this study is to analyze the technological content knowledge of historical educators in Jember Regency. This type of research is descriptive research. Data collection methods in this study are questionnaire. The questionnaire technique carried out by researchers was by distributing questionnaires or questionnaires to educators using a self assessment, with the help of Statistical Package for the Social Si (SPSS) version 22 program. Based on the results of descriptive statistics the level of technological content knowledge history educators in Jember Regency scored ( $M = 3.29$ ,  $SD = 0,417$ ), 60.6% of Technological content knowledge history educators in Kabupaten Jember are at a good level. And as many as 27.3% are at a sufficient level. Then at a low level of 12.1%, while at a very low level and very good at 0%. So, it can be concluded that the level of technological historical knowledge content in Jember Regency is at a good level.

### 1. Introduction

Based on the Republic of Indonesia's Minister of Education and Culture Regulation No. 22 of 2016 concerning Basic and Secondary Education Process Standards that the learning process can be carried out by utilizing information and communication technology to improve the efficiency and effectiveness of learning [8]. In line with the development of increasingly sophisticated technology, requires an educator to integrate technology with the content of learning materials [5]. Some research results, recognizing that the power of technology to teach and learn with information and communication technology (ICT), shows the effect on student achievement [2,9,10,11].

Indonesian education is currently facing a global challenge called the industrial revolution era 4.0. The era of the industrial revolution 4.0 is a digital era, where data that were both physical and manual changed direction towards digital data with computer or smartphone programming languages, making it more effective, efficient, manageable funds [6].

The ability to integrate technology and content of instructor learning materials can be realized one of them by improving and developing the quality of Technological Content Knowledge. Technology Content Knowledge (TCK) refers to an understanding of which technologies are appropriate to use in various disciplines, whether in the classroom or on the job. Inherent here, too, is the understanding that technology may require a compromise of content or may enhance representation of content [4,5]. Educators need to understand which technology is most suitable for learning materials in their domain and how to dictate or change technology [3,4]. Related to this, educators need to have the ability to be capable in using technology and in choosing subjects or subject matter that is in accordance with the technology that will be used in learning.



## 2. Methods

This type of research is descriptive research. Descriptive research (descriptive research) is research that requires researchers to be interested in the process, meaning and understanding which are then described in the form of words and images [1].

Data collection methods used in this study are (1) observation; (2) questionnaire; and (3) documentation. The questionnaire technique used by researchers uses a Likert Scale with a range of values 1-5. Questionnaires distributed to educators use self-assessment. Self-assessment is a technique in which educators are asked to assess themselves in relation to the process, and the level of achievement of the competencies they have learned.

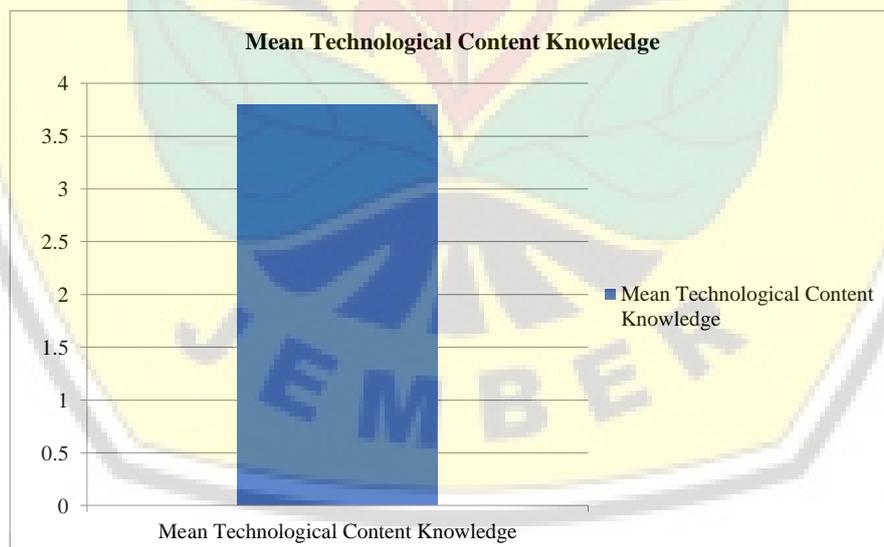
Data analysis in this research is quantitative data analysis. Quantitative data is used to obtain data needed to identify the level of technological content knowledge of history educators in Jember Regency. Quantitative data were obtained through a questionnaire that was analyzed using descriptive statistical analysis. Descriptive statistics are used to find a general description of the data from the study sample based on the mean value, frequency, and percentage of scores obtained with the help of the Statistical Package for the Social Sciences (SPSS) version 22 program.

## 3. Results and Discussion

### 3.1. Descriptive Statistics of Technological Content Knowledge Based on All Respondents

Descriptive statistics on technological content knowledge of history educators in Jember Regency show values ( $M = 3.29$ ,  $SD = 0,417$ ,  $Max = 4,00$ ,  $Min = 2,36$ ). Based on this it can be concluded that the level of technological content knowledge of history educators in Jember Regency is included in both categories based on the interpretation of scores by Moidunny.

The level of Technological content knowledge of history educators in Jember is 60.6%, which is at a good level, and as much as 27.3% is at a sufficient level. Then at a low level of 12.1%, while at a very low and very good level of 0%. So, it can be concluded that the level of technological content knowledge of history educators in Jember Regency is at a good level.



**Figure 1.** Graph Chart of Technological Content Knowledge Mean History Educator in Jember Regency

**Table 1.** Level of Technological Content Knowledge History Educators in Jember Regency

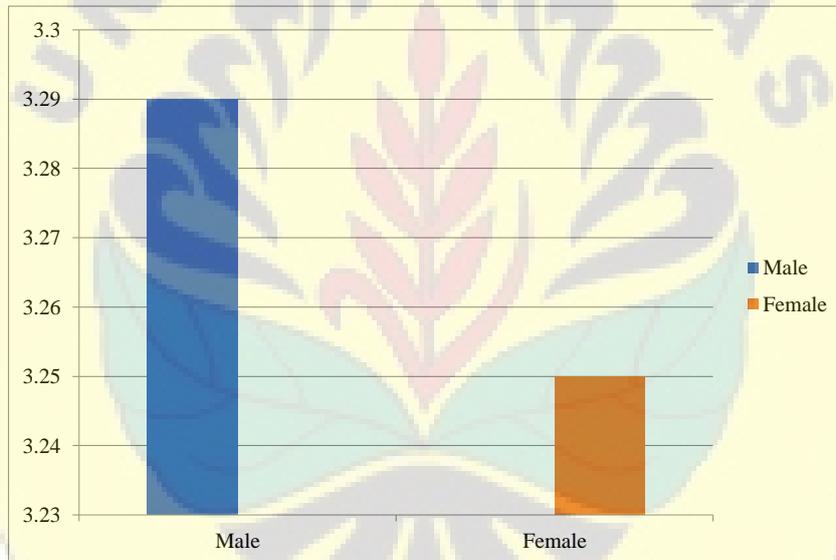
No	Mean Score	Interpretation	Number of Samples	Presentase
1.	1.00-1.80	Very low	0	0%
2.	1.81-2.60	Low	4	12,1%
3.	2.61-3.20	Enough	9	27,3%
4.	3.21-4.20	Good	20	60,6%
5.	4.21-5.00	Very Good	0	0%
Total			33	100%

Source: Primary Data Processed

**3.2. Descriptive Statistics of Knowledge of Technology Content Based on Gender**

Descriptive statistics of the mean value obtained from the total number of male is equal to ( $M = 3.29$ ,  $SD = 0.649$ ), while the mean value of female is equal to ( $M = 3.25$ ,  $SD = 0.832$ ).

Based on gender differences, the percentage obtained is male, 36.4% while the percentage of female is 63.6%.



**Figure 2.** Technological Content Knowledge Diagram Graph Based on Gender

**Table 2.** Percentage Rate Based on Gender

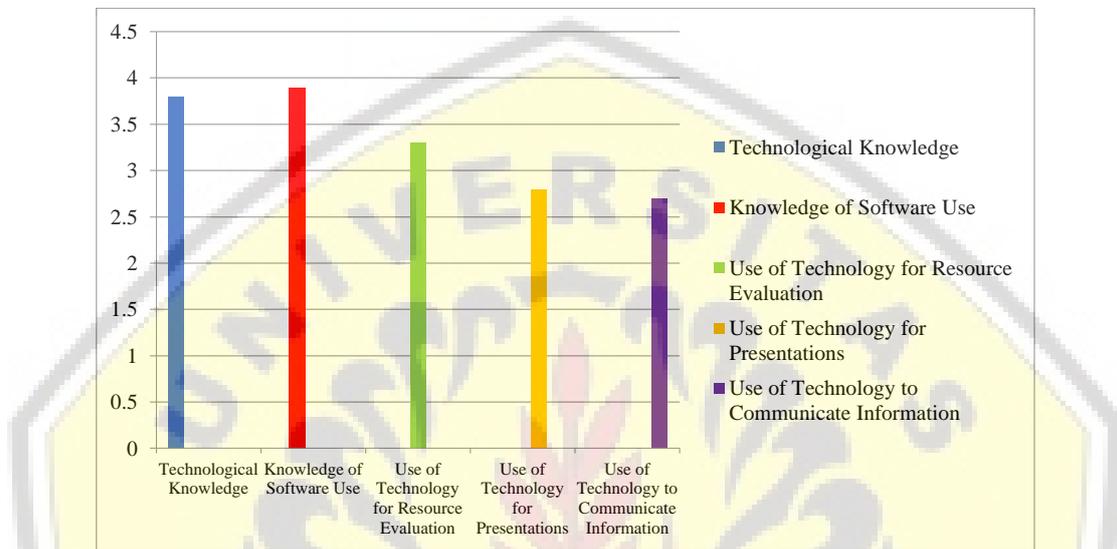
No	Gender	Amount of Sample	Presentase
1.	Male	12	36,4%
2.	Female	21	63,6%
Total		33	100%

Source: Primary Data Processed

**3.3. Descriptive Statistics of Technological Content Knowledge Based on TCK Component**

Scores on each component of technological content knowledge, it can be seen that the knowledge of the use of software has the highest score with acquisition ( $M = 3.95$ ,  $SD = 0.622$ ) with good category, the second highest score is technology knowledge with acquisition ( $M = 3.78$ ,  $SD = 0.619$ ) including

the good category, the use of technology for evaluation of resources with the acquisition of value ( $M = 3.29$ ,  $SD = 0.561$ ), and the use of technology for presentation obtains a value ( $M = 2.75$ ,  $SD = 0.573$ ) including the adequate category, and the use of technology for communicating information with values ( $M = 2.68$ ,  $SD = 0.908$ ) including enough categories. So, it can be concluded that history educators in Jember Regency have competence in integrating technology with good content.



**Figure 3.** Mean Technological Content Knowledge Diagram Graph based on Components

**Table 3.** Descriptive Statistics of Technological Content Knowledge Based on Components

Component	N	Mini- mum	Maxi- mum	Mean	Std. Deviation	Interpreta- tion
Technological Knowledge	33	2.60	5.00	3.78	0.619	Good
Knowledge of Software Use	33	2.60	5.00	3.95	0.622	Good
Use of Technology for Resource Evaluation	33	2.20	4.20	3.29	0.561	Good
Use of Technology for Presentations	33	1.80	3.80	2.75	0.573	Enough
Use of Technology to Communicate Information	33	1.00	5.80	2.68	0.908	Enough

Source: The source of the table

#### 4. Conclusions

Based on the results of descriptive statistics the value of the mean technological content knowledge of history educators in Jember Regency based on its indicators namely technological knowledge has a value ( $M = 3.29$ ,  $SD = 0, 417$ ,  $Max = 4.00$ ,  $Min = 2.36$ ) indicates a good category. Based on the

Descriptive Statistics table component of technological content knowledge, it can be seen that the knowledge of the use of software has the highest score that is by acquisition ( $M = 3.95$ ,  $SD = 0.622$ ,  $Max = 5.00$ ,  $Min = 2.60$ ) with good category, the second highest score is technology knowledge with acquisition ( $M = 3.78$ ,  $SD = 0.619$ ,  $Max = 5.00$ ,  $Min = 2.60$ ) including the good category, the use of technology for resource evaluation with the acquisition of values ( $M = 3.29$ ,  $SD = 0.561$ ,  $Max = 4.20$ ,  $Min = 2.20$ ), and the use of technology for presentations obtains values ( $M = 2.75$ ,  $SD = 0.573$ ,  $Max = 3.80$ ,  $Min = 1.80$ ), including enough categories, and the use of technology to communicate information with values ( $M = 2.68$ ,  $SD = 0.908$ ,  $Max = 5.80$ ,  $Min = 1.00$ ) including enough categories. So, it can be concluded that history educators in Jember Regency have the competence in integrating technology with (content) subject matter.

Based on the results of descriptive statistics on the level of technological content knowledge of history educators in Jember District obtained grades ( $M = 3.29$ ,  $SD = 0.417$ ,  $Max = 4.00$ ,  $Min = 2.36$ ), Technological content knowledge educators history in Jember Regency as much as 60.6% is at a good level. And as many as 27.3% are at a sufficient level. Then at a low level of 12.1%, while at a very low and very good level of 0%. So, it can be concluded that the level of technological content knowledge of history educators in Jember Regency is at a good level.

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