

Survey of Knowledge Transformation Among Nursing Students During the Online Learning Methods

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Abstract

Introduction: Learning from conventional methods is transformed into *online methods*. These changes encourage new adaptations of technology to support the continuity of the learning process. The *online* learning process in Indonesia has not been implemented optimally, due to the *unpreparedness* of teachers and learners. In the adaptation process that there are obstacles affecting the transformation of student knowledge with *online* learning methods.

Aim: This research describes the knowledge transformation among nursing students during the online learning methods.

Methods: The study design was a descriptive survey. The sampling technique used was total sampling. The sample included 128 bachelor's students at the nursing program, Faculty of Medicine, Universitas Diponegoro. The data were taken using the Constructivist Online Learning Environment Survey (COLLES) questionnaire, which includes relevance, reflective thinking, inter-activeness, tutor support, peer support, and interpretation. Data analysis used distribution frequency, boxplot, and quartile.

Results: The highest components were in the relevance component (16.90 ± 1.915) and the lowest reflective thinking component (14.55 ± 2.255) and inter-activeness (14.55 ± 2.559). Overall, the transformation of nursing students' knowledge with the majority of online learning methods in the category of Good was 70 respondents (54.7%).

Conclusion: Nursing students can increase their knowledge transformation by being more active in giving and responding to opinions, improving critical thinking skills and praising each other's contributions between friends during learning. Lecturers can enhance the ability to create a creative, innovative, and interactive learning process.

Keywords: knowledge transformation, nursing students, online learning

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INTRODUCTION

Since Indonesia has seen the COVID-19 pandemic impact on education, the government has set policies to prevent the increase in cases. The policy of the government is to have the students learning from home, and the lectures working from home. One such policy was that conventional methods were converted into online methods (Komang and Astini, 2020). The online learning process in Indonesia has not been implemented yet optimally. This is because the lecturers and students might have obstacles, such as learning management system development and internet connectivity. Moreover, the process of adaptation of online learning that has not been maximal will impact the transformation of students' knowledge. Knowledge transformation is the process of receiving knowledge which is further modified according to the understanding of the recipient of knowledge (Wye et al., 2015). This transformation knowledge of the students is also according to how the learning methods provide for the students during the online learning. When the system capacity does not develop well, the knowledge would not be transformed adequately to students.

Some institutions might face some problems in providing online learning during an outbreak of COVID-19. Iskandar, Masthura and Oktabiyana (2020) found in their study that, within the application of online learning methods, both lecturers and students had the feeling of unhappy (56.6%); the understanding of the material given by lecturers was 37.1%, and 23.8% of them had slightly understood; 39.9% students had a signal problem, and the other 37.8% had a problem with internet credit.

The online learning also obstructs the quality of interaction between students and the lecturer. They often experienced miscommunications with

lecturers, and even had one miscommunication per student (Adijaya and Santosa, 2018). Research conducted by Hikmat et al. (2020) found that the online learning was only effective for theory courses. For the practical skills, the lecturers need effort to explain the procedure online because it had insufficiency of instruments to practice online. The online learning also has opportunities for students, such as saving more time and energy, being proficient in using technology, and avoiding COVID-19 spread (Jamaludin, 2020).

In particular, the Department of Nursing, Faculty of Medicine, Universitas Diponegoro, followed the government's rule to conduct online learning for all levels of the students during the outbreak of COVID-19 in year of 2020 to now. This is a challenge for the institution and all the academic activity to perform the system. Universitas Diponegoro has a learning management system (LMS) called KULON (*kuliah online*) to provide the asynchronous learning. Meanwhile, for synchronous, Microsoft Teams are used. All courses and learning subjects are imported to the system. However, to know whether the knowledge can be transformed well by the students, there is need of an evaluation on the process of online learning during an outbreak of COVID-19. Therefore, this study aimed to describe the relevance, reflective thinking, inter-activeness, tutor support, peer support, and interpretation of the online learning process.

METHODS

Study Design

This research uses a descriptive survey research design. The research occurred at the nursing department, Faculty of Medicine, Universitas Diponegoro.

Population, Samples, and Sampling

The total sampling of respondents was nursing students, one hundred and twenty-eight bachelor students who were taking a course of emergency and critical care nursing.

Instruments

Data collection used the Constructivist Online Learning Environment Survey [COLLES] (Taylor and Maor, 2000) and was translated by Sulisworo et al. (2019) into an Indonesia version. The questionnaire consists of six subscales with four statement items per subscale. The measurement results used the mean total score and standard deviation of each subscale and the entire statement item. To know the score of knowledge transformation, it has two categories, namely, fewer and good categories in each subscale. A score below the mean value indicates less knowledge transformation, and a score above the mean value indicates a good knowledge transformation. The COOLES validity was 0.60, and the reliability was 0.90 in Bahasa. The face validity was conducted on ten nursing students to know the discrepancy of the statements after doing back translation.

Procedures

The data collection procedures used online by uploading the questionnaire into a free online application form, including Jotform and Zoho form. The explanation of the procedures to fill in the questionnaires was provided. If there were any items that they could not understand the respondents could ask directly. All respondents had were given a week to fill in the questionnaire. After that, the researchers checked the completed questionnaires.

Data Analysis

The data analysis used descriptive analysis and the central tendency (mean score) on variables or subscales of knowledge. Percentiles and box plots are used to determine the tendency of knowledge transformation that students have after the implementation of online learning methods.

Ethical Clearance

Ethical clearance approval was number 006/EC/KEPK-STIKES_Kendal/III/2021. The respondents had the right to withdraw anytime without any consequences on their learning activities. Data were used only in the research and were stored in the researchers' repository.

RESULTS

Characteristics of the Respondents

The characteristics of respondents to this study showed that the number of women was 94.5%. The age of most respondents at the age 20 was 49.2% (Table I). The transformation of nursing students' knowledge with online learning methods in the respondents of this study was mostly included in the lesser category, which is as much as 54.7%.

Table I. Characteristics of Respondents (N=128)

Characteristics of the Respondents	f	%
Gender		
Male	7	5.5
Female	121	94.5
Age (years)		
19	5	3.9
20	63	49.2
21	57	44.5
22	3	2.3
Overall knowledge transformation		
Good	70	54.7
Less	58	45.3

The Component of Knowledge Transformation

The component of transformation knowledge consisted of six parts, including relevance, reflective thinking, inter-activeness, tutor support, peer support and interpretation. For most respondents, as much as 57% of the relevance and peer support components had a good category. The reflective thinking component showed that more than half of the respondents were in the good category at 50.8%. Respondents to the inter-activeness component had a good category and less was the same amount of 50%. The tutor support component showed that most respondents were in the category of less than 60.9%. Interpretation was the last component, with most respondents in the good category at 52.3% (Table 2).

Table 2. The Component of Knowledge Transformation among Nursing Students (N = 128)

Transformation Components Knowledge in Online Learning	f	%
Relevance		
Good	73	57
Less	55	43
Reflective thinking		
Good	65	50.8
Less	63	49.2
Inter-activeness		
Good	64	50
Less	64	50
Tutor Support		
Good	50	39.1
Less	78	60.9
Peer Support		
Good	73	57
Less	55	43
Interpretation		
Good	67	52.3
Less	61	57.7

The knowledge transformation component is sorted from the highest to the lowest level based on the mean values and standard deviations. The relevance was 16.90 ± 1.915 ; tutor support was 16.09 ± 2.199 ; interpretation was 15.24 ± 2.051 ; peer support was 14.89 ± 2.523 ; inter-activeness was 14.55 ± 2.559 ; and reflective thinking was 14.55 ± 2.255 . The higher the mean value showed that the knowledge transformation succeeded (Table 3).

Table 3. Mean and Standard Deviation of Knowledge Transformation among Nursing Students (N=128)

Sub Scales	Mean \pm SD
Relevance	16.90 ± 1.915
Reflective thinking	14.55 ± 2.255
Inter-activeness	14.55 ± 2.559
Tutor Support	16.09 ± 2.199
Peer Support	14.89 ± 2.523
Interpretation	15.24 ± 2.051

The boxplot analysis (Figure 1) showed that values among nursing students in their knowledge transformation varied. Almost all data components were not symmetrical because they have a median line not exactly in the middle of the box and one of the whisker lines was longer, except the data interactive component was symmetrical because it has a median line right in the middle of the box and the whisker line is equally long. Moreover, the relevance, reflective thinking, and peer support components of the median line are close to Quartile-3, so it could be concluded that in the component students tend to have good knowledge transformation. The tutor support component is a component whose median line

is close to Quartile-I. This means that the student support tutor data tend to be in fewer categories. The median line of the interactive component was in the middle of the box, meaning that the number of categories are

fewer and the categories of both components are balanced. The interactive component, peer support and tutor support, had outlier values and indicated less knowledge transformation.

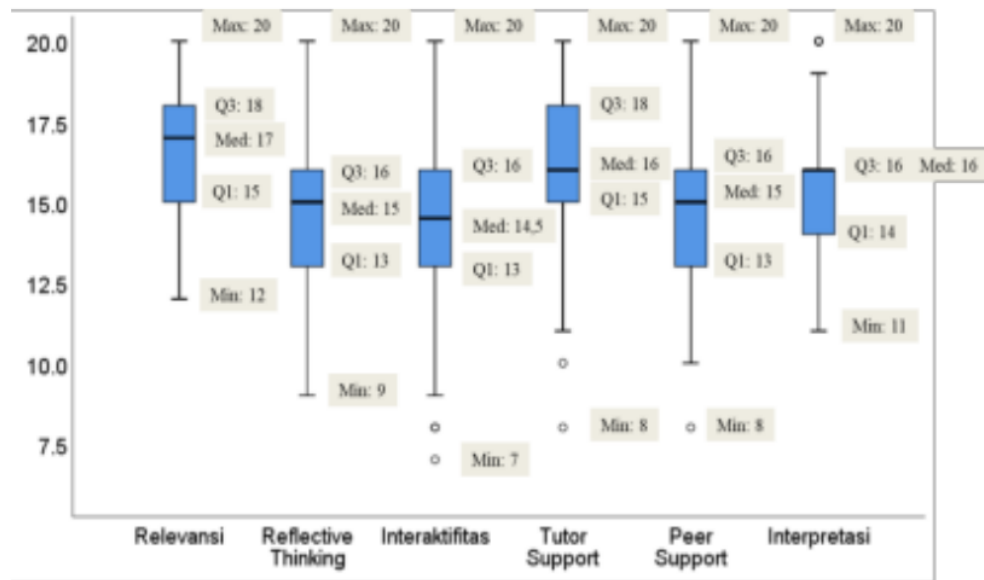


Figure 1. Box Plot Knowledge Transformation Components

Distribution of Dimension Knowledge Transformation among Nursing Students

For the relevance component, the students stated that 'What I learned was important to my professional practice' was 63.3%. The reflective thinking components were 15.6% students answered often for the statement 'I think critically about my own ideas.' The interactive component had the

most respondents who answered "often." The entire statement in the *tutor support* component showed that most respondents answered "often." Most respondents in the *peer support* component answered "often." However, most respondents in the second statement responded "sometimes." The interpretation component shows that throughout the statement, most respondents answered "often" (Table 4).

Table 4. The Distribution Frequencies of Knowledge Transformation Component among Nursing Students (N = 128)

No.	Statements	Always	Often	Sometimes	Rare	Never
Relevance Component						
1	My learning focuses on issues that are my interest.	10.9%	44.5%	41.4%	1.6%	1.6%
2	What I learn is important for my professional practice.	63.3%	31.3%	5.5%	0%	0%
3	I have learned how to improve my professional practice.	39.1%	49.2%	11.7%	0%	0%
4.	What I had to do with my professional practice.	50.8%	42.2%	6.3%	0.8%	0%
Reflective Thinking Components						
1	I think critically about how I learn.	13.3%	46.1%	39.8%	0.8%	0%
2	I think critically about my own ideas.	15.6%	44.5%	39.1%	0.8%	0%
3	I think critically about other students' ideas.	6.3%	37.5%	50.8%	4.7%	0.8%
4	I think critically about ideas in reading.	10.9%	47.7%	36.7%	4.7%	0%
Interactive Component						
1	I explained my idea to the other students.	10.2%	49.2%	31.3%	9.4%	0%
2	I asked the other students to explain their ideas.	25%	43.8%	27.3%	2.3%	1.6%
3	The other students asked me to explain my idea.	7.8%	39.1%	44.5%	8.6%	0%
4	Other students responded to my idea.	12.5%	40.6%	40.6%	6.3%	0%
Tutor Support Components						
1	Teachers stimulate my thinking.	14.8%	57.8%	25.8%	1.6%	0%
2	The teacher encouraged me to participate.	18.8%	56.3%	21.9%	3.1%	0%
3	Teachers encourage good learning.	35.2%	53.1%	10.9%	0.8%	0%
4	Learn to provide a critical example of self-reflection.	30.5%	48.4%	20.3%	0.8%	0%
Peer Support Component						
1	Other students encouraged my participation.	14.8%	52.3%	28.1%	4.7%	0%
2	Other students praised my contribution.	7.8%	43%	43%	6.3%	0%
3	Other students appreciated my contribution.	18%	53.1%	28.1%	0.8%	0%
4	Other students empathized with my struggle to learn.	14.1%	46.1%	35.9%	3.9%	0%
Interpretation Component						
1	I understand the other students' messages well.	13.3%	64.8%	21.1%	0.8%	0%
2	The other students understood my message well.	9.4%	60.2%	28.9%	1.6%	0%
3	I understand the teaching's message well.	14.8%	57.8%	25%	2.3%	0%
4	The teacher understood my message well.	11.7%	50.8%	34.4%	3.1%	0%

DISCUSSION

Most of the respondents to this study in *online* learning had knowledge transformation in fewer categories while the students who followed the online learning had good categories in their knowledge transformation. This was because the students only required for knowledge achievement. The difference in results in this study can be due to learning factors. For the cognitive achievement, the online learning system can be met with the learning outcomes. The lack of knowledge transformation shown in this study is because the students expressed as being uncomfortable using *online* media for learning. This condition can be seen from the results of each knowledge transformation components that have not maximally supported the success of knowledge transformation (Naigolan, 2016). In some topics where they need the real description of the instrument, they only found the pictures from the internet or from videos on t YouTube. It can delay the process of sharing and increasing the students' knowledge. However, the practicum session showed that was undone by online learning and Rondonuwu, Mewo and Wungouw (2021) stated that online learning methods were less effective in meeting the practicum competencies.

The interesting content in online learning is a phenomenon for the students. These did not adapt quickly to the learning management system. Some factors might influence the interest of the students to get the achievement of knowledge transformation. This research showed that there was a lack of interest among nursing students. In the interesting learning, Relevance was the first component with the highest mean value and more than half of the respondents had good categories. The results

conform to Kaunang and Usagawa (2017) who showed the high relevance with the content of learning in accordance with student expectations. Therefore, the relevance of the content given by the lecturers in the online learning met the expectations of the learning outcomes.

The results showed that more than half of the respondents in the *tutor support* component were less relevant to student interests and can take a personalized approach. Therefore, it is important to implement the relevant topics and methods giving to the students. It offers an opportunity to highlight the learning topics that are considered interesting to them and relevant to learn (Albrecht and Karabenick, 2018). This was because the students had obstacles when the lecturers provided a stimulation of thinking and encouraging students' participation. Rindrayani (2017) found that the lecturer was required to explain the material well, systematically and give concrete examples associated with the facts experienced by the students. Lecturers should not only be a source of value and truth, but act as facilitators, stimulate thinking, and encourage students to exchange opinions (Tiwa, 2018). Lecturers can use interactive teaching styles, create challenging learning and encourage self-thinking to stimulate student thinking (Shin and Bolkan, 2021).

The interpretation component is the third highest component. The interpretation component showed that students can interpret other students' messages (Kaunang and Usagawa, 2017). More than half of the students in this study answered that they frequently understood the learning interpretation between and within them. Therefore, both lecturers and students in online learning should be easily analyzed, understood, and assimilated. The lecturers and

students should be able to establish good and open communication even if only through online media to prevent misinterpretation (Yuangga and Sunarsi, 2020).

The research found that peer support was the lowest level. In this study, peer support had a valuable contribution and often encouraged the students to get active participation in the study or group work. The participation in learning peer support during online learning occurred when the students provided mutual support, respect, empathy and encouraged each other to contribute (Kaunang and Usagawa, 2017). Therefore, the students' praise given to their friends affected learning motivation among them (Azis, 2017). This is in contrast to the research of Azhari et al. (2020) in pharmacy students.

The interactive component was a component with a low mean value. These results were in accordance with Azhari et al. (2020). It was found that for the students who were less active in participation in online learning, they required the interaction with the fellow students to share ideas, recommend solutions, or ask questions. However, most respondents had the perception that other students responded to students' ideas and had explained their ideas only occasionally. In the other words, the situation was low inter-activeness. This could be due to a lack of student motivation toward learning. Student's motivation can be influenced by the interest of the material studied and orientation in following learning. Student motivation is also influenced in that they want to achieve praise from friends or lecturers, respect, and so on. Therefore, it is important to increase student learning motivation to increase inter-activeness among students.

Reflective thinking measures the extent to which online learning encourages students' reflective critical thinking (Azhari et al., 2020).

The results expressed most respondents answered often of thinking critically about their ideas, ideas in reading, and how they learned. However, the lack of active students to think critically about other students' ideas can be due to the lack of optimal inter-activeness components. Thus, it is necessary to increase the inter-activeness component to improve reflective thinking. Students can also conduct a collective reflection, where students interchange their perspectives and reevaluate it (Larsen, London and Emke, 2016).

CONCLUSION

The students' knowledge transformation in the online learning methods requires improvement. Government, institutions, and all civitas academica should improve and develop the learning management online system better. The study recommends to the institution that particularly the learning contents should attract the students' attention during the online learning. The students are expected to increase their knowledge transformation by engaging and responding to the opinions, critical thinking, and discussing. Furthermore, lecturers are also required to improve their ability to create creative course content, innovative, and an interactive learning process. Further research is recommended to examine a learning model to improve the students' knowledge transformation.

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CONFLICT OF INTEREST

None

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