

CRITICAL THINKING AND ITS AFFECTING FACTORS

Slameto

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ABSTRACT

The objectives of this research were to measure the success rate achieved by the alumni of Open/Distance Learning (O/DL), the Bachelor Education In-service Teachers Program (BEITP), Staya Jacana Christian University (SWCU), Salatiga in their critical thinking habit that lead to their success, and to find factors which determined their critical thinking habit. The factors concerned were student factor (learning motivation, alumni's readiness to enter ICT community, prerequisite) or teacher factor (teacher's ability in creating and using a new instructional context). This quantitative research belongs to the causality ex-post facto research. The data source was one class of O/DL, the BEITP, SWCU students, who were chosen out of four classes, as many as 32 alumni in the academic year 2015/2016. Data were screened using a self-rating scale, which consisted of 40 items tested valid and reliable, and then reduced to 5 variables. The BEITP, SWCU Salatiga had graduated most of its alumni who owned critical thinking habit at a high rate. The critical thinking habit was affected by the instructional contexts which enabled a new situation (Model 1), alumni's readiness to enter the ICT community (Model 2), pre-requisite, i.e., mastery of previous lecture materials (Model 3), and student's learning motivation (Model 4) to reach 81%. The alumni's critical thinking habit of 51.20% was determined by the teacher's role in developing instructional contexts which made a new situation possible. This finding was useful for educational quality management for the effectiveness and productivity of higher education, which should have been focused on the teacher in developing an instructional strategy based on context, alumni readiness to enter the ICT community, prerequisite, and student's learning motivation.

Keywords: critical thinking habit, learning motivation, ICT community, prerequisite, instructional contexts.

ABSTRAK

Tujuan penelitian ini adalah untuk mengukur tingkat keberhasilan dalam berpikir kritis dan faktor-faktor yang menentukan kebiasaan berpikir kritis para alumni Open/Distance Learning (O/DL), Program Guru In-Service Guru Pendidikan (BEITP), Universitas Kristen Satya Wacana (UKSW), Salatiga. Faktor-faktor yang berkenaan dengan siswa meliputi motivasi belajar, kesiapan alumni untuk memasuki komunitas TIK, prasyarat, dan faktor guru meliputi kemampuan guru dalam menciptakan dan menggunakan konteks pembelajaran baru. Penelitian kuantitatif ini termasuk dalam penelitian kausalitas ex post facto. Sumber data adalah satu kelas O/DL, BEITP, dan mahasiswa UKSW yang dipilih dari empat kelas sebanyak 32 alumni pada tahun ajaran 2015/2016. Data yang disaring menggunakan self-rating scale yang terdiri dari 40 item yang diuji valid dan reliabel kemudian dikurangi menjadi 5 variabel. Alumni BEITP, UKSW Salatiga telah lulus dan sebagian besar memiliki kebiasaan berpikir kritis pada tingkat tinggi. Kebiasaan berpikir kritis dipengaruhi

oleh konteks instruksional yang memungkinkan situasi baru (Model 1), kesiapan alumni untuk memasuki komunitas TIK (Model 2), prasyarat, yaitu penguasaan bahan kuliah sebelumnya (Model 3), dan siswa Motivasi belajar (Model 4) mencapai 81%. Kebiasaan berpikir kritis alumni sebesar 51,20% ditentukan oleh peran guru dalam mengembangkan konteks pembelajaran yang membuat situasi baru menjadi mungkin. Temuan ini bermanfaat untuk manajemen kualitas pendidikan untuk efektivitas dan produktivitas pendidikan tinggi, yang seharusnya difokuskan pada guru dalam mengembangkan strategi pembelajaran berdasarkan konteks, kesiapan alumni untuk memasuki komunitas TIK, prasyarat, dan motivasi belajar siswa.

Kata Kunci: *kebiasaan berpikir kritis, motivasi belajar, komunitas TIK, prasyarat, konteks instruksional.*

INTRODUCTION

Critical thinking skills are essential skills for life, work, and function effectively in all other aspects of life (Slamet, 2014). The role of teachers is now more complex than ever before, for example, how teachers respond to the diverse needs of students is constantly changing as a result of such rapid technological developments and the demands of the community to achieve excellence, as well as changes in the social construction of society and globalization. Critical thinking is a cognitive activity which is related to the use of reasoning. Learning to think critically means using mental process, such as listening, categorizing, selecting, and assessing or deciding. Critical thinking ability gives a precise direction in thinking and working, and helps in determining a relationship between things in a more accurate way. Therefore, the critical thinking ability is very much needed in solving or finding a solution to a problem and in managing assignments (Prabowo, 2011). In order to become a habit, the development of critical thinking ability involves the integration of a few abilities: observation, perception of information from various viewpoints, analysis, reasoning, assessment, decision making, and persuasion. The better the development of these abilities-given such habit has been formed, we will be more able to overcome complicated problems which a satisfactory result.

Critical thinking includes activities, such as detailed and thorough observation, identification of tendencies and patterns as in information mapping, identification of similarities and dissimilarities, etc., repeating observation to ensure there is no skipping, seeing the obtained information from various viewpoints, selecting preferred solutions objectively, and considering impacts and long-range consequences from the solutions that have been chosen (Edi, 2012).

Learning to develop critical thinking habit emphasizes the importance of student's efforts to actively analyze and solve various surrounding problems including the learning process. Reference (Kember, 1997)]asserted that teacher's lack of understanding about critical thinking results in the tendency to not teach nor assess the student's thinking skills. Often, critical thinking instructions are thought of as problem solving, despite solving problems are part of critical thinking ability (Prabowo, 2012).

The development of critical thinking ability is an integration of some parts of ability development, such as observation, analysis, reasoning, assessment, decision making, and persuasion. The better the development of these abilities, we will be more able to overcome complicated problems or projects which a satisfactory result. Instructional strategies which can increase critical thinking ability are (1) group learning through small group discussions, (2) using relevant contexts such as a problem in the training material which is understood by the participants can increase critical thinking ability, and (3) assessment procedure which needs an in depth study motivates participants to learn more meaningfully without rote memorization

(Gokhale, 1995). A group learning method or an ability to cooperate is very much needed. Besides overcoming individual learning weaknesses which is often caused by self-limitation, working in groups also characterizes modern development nowadays. Effective collaboration is usually balanced by individual skills in a continuous inquiry.

One factor which determines the success of critical thinking instructional program is training for teachers. However, we have to remember that training only will not be effective in improving thinking skills if its application is not as expected and not supported by appropriate administration and management, and the on-going program is not compatible with the student population (Cotton, 1991). Although it is not yet developed, the ICT-based instructional management which stresses on the importance of program productivity (in this case critical thinking habit) enables teachers to make a reflection on the process of their instructions both at individual and group levels (for example, in a conference and a joint product on on-line electronic self-assessment). Motivating teachers and students to think critically about teaching-learning processes (in the ICT-based instructions) can make some aspects of teacher's pedagogy more accurate and efficient (Slameto, 2015).

The problems in this research were limited in the development of the critical thinking habit of students of O/DL, the BEITP, SWCUSalatiga. The problem statements were: (1) how high is the rate of critical thinking habit for the success of the alumni? (2) what side factors of the instructions determine critical thinking habit for the success of the alumni? In the educational perspective as a system, the result (the alumni's success in the form of critical thinking habit) was directly affected by the process (instructional management). Here, the students and the teachers play a primary role to be attended (Miarso, 2008). The student factor includes learning motivation (X_1), readiness to enter ICT community (X_2), and the mastery of past materials (prerequisite) (X_3). The teacher factor comprises teacher's ability to create and to use new instructional contexts in the ICT-based PJJ program (X_4) (Gokhale, 1995).

Motivation is a drive which arises consciously or unconsciously to do an action for a particular purpose (Depdikbud, 1994). Motivation comes from the word motif, meaning a motor from the inside and in a subject to perform a particular activity for a purpose. Motif can also mean an internal condition (alertness); therefore, motivation means an active motor power at particular times to achieve an urgent or felt purpose. For students, their primary activity is to study. According to Reference (Slameto, 2010), motivation is a driving power or stimulus to achieve an objective. Student's learning motivation is an internal state which stimulates and directs their attitude for a purpose to be achieved in participating in education (Anggraini, 2016). What is meant by student motivation, therefore, is the whole internal drive power which evokes a learning activity Norma, 2016).

Student learning motivation should have been realized in the following attitudes: always coming to classes, attending to lectures actively, making notes diligently, doing assignments given by teachers on their own initiative and awareness, reading in or borrowing from the library, and using leisure time to study. Besides, students who have a high learning motivation possess a high target to achieve, a sense of appreciation to themselves, and a competition of achievement among classmates because for them attending classes is very important for their future life.

Education is a means for social empowerment for the future and preparing students to encounter global change challenges (Wiggin et al., 2009). Education must play its role and prepare students for the constellation of global society. Despite its future orientation, it must be based on the present conditions (Jalal & Supardi, 2001). The global society constellation is characterized by advances in science and technology, especially the information and communication technology (ICT). The ICT or information community is often used to describe

a community which uses information technology in a high intensity in everyday life. The community uses the same or compatible technology for various individual, social, educational, business activities, and even to spend leisure time. The technology has the ability to send, receive, and exchange digital data in a high velocity between places regardless of distances. The ICT community or the information is also called digital community (Wikipedia Bahasa Indonesia, 2016).

Some of the indicators for the ICT community can be identified from the ability in utilizing ICT individually or in a team work to support critical thinking, creativity, and innovation for educational purposes, networking, and recreational purposes; from the critical and reflective attitude when receiving information in a conscious way that there is a business motif in technology; from the understanding in the consequences of using ICT, owning competence in understanding the values and responsibilities in communication and other qualities; from being responsible in using technology, having sensitivity in making the internet safe (Susanti, 2012).

In agreement with the principle of re-constructionism, the condition of the society always wants basic changes (Sanaky, 2016). In this case, education especially the Higher Education should be able to produce products which are needed by the changes towards ICT community. In the adverse condition of education in Indonesia, the problem is whether education/higher education is still competent in producing graduates who are ready for the ICT community: what factors are affecting? This is critical for the quality management of education in view of effectiveness and productivity of Higher Education.

Prior knowledge, which is also called prerequisite knowledge, is a group of students' knowledge and experiences obtained throughout their life time, and what they would bring to a new learning experience. What the students know more or less affects what they are learning. A student learns by connecting new ideas with old ones. The significance of the prior knowledge is to help students build a bridge between new knowledge and that that they have already (Arends, 1997). Prior knowledge has at least four characteristics: (1) it is based on student's life experiences, (2) student's prior knowledge is sometimes different from that used by scientists or teachers, (3) it is resistant to changes and tenacious, although it goes through a formal instruction, and (4) prior knowledge will affect the process of instruction or conceptual development (Tsai & Hung, 2002). The student's prior knowledge is an important element in the process of lectures because it can help students find new things and understanding. It determines a possible, new learning (Istibsyaroh, 2017).

Contexts are physical or social environmental aspects which are interconnected with particular utterances. In addition, contexts are a set of knowledge which has the same speakers and listeners *selain itu*, so that the listeners understand what is meant by the speaker. Contexts are a cause and a reason for a conversation to take place (Lestari, 2015). In an instruction, contexts are related to participants (teachers and students) and they also play a role in understanding meaning and information conveyed by the teacher including in the ICT-based instructions. The use of a relevant context such as the problem in the class materials which is understood by participants may increase critical thinking ability, and furthermore, an assessment technique which needs a deeper study encourages students to learn more meaningfully but not only memorizing (Gokhale, 1995).

The objectives of this research were to measure the rate of critical thinking habit as a token for the alumni's success, and to identify side factors in the instructions which became determinants for critical thinking habit, including student factor, namely, learning motivation, readiness to enter the ICT community, and the mastery of previous lectures (prerequisite). Teacher factor included teacher's ability in creating and using new instructional contexts in the ICT-base O/DLclasses. A new finding in this research would have been very useful for

educational quality management, not only in terms of efficiency but also effectiveness in the productivity of the ICT-based PJJ Program.

RESEARCH METHOD

This study was conducted on the basis of the assessment of the alumni of O/DL, the BEITP, SWCUSalatiga. The O/DL program was administered in 5 different regencies, namely, Kebumen, Grobogan, Pati, Kudus, and Batang. The sample was randomly selected from one regency, i.e., Batang regency, as many as 48 people.

Based on the formulation of the problem, this research was an inferential quantitative research. The quantitative research revealed inferential relationship between two or more variables that could examine the effect of variables X_1 (student learning motivation), X_2 (readiness of graduates to enter the ICT community), X_3 (prerequisite-the mastery of the previous lecture material), X_4 (instructional context that allow new situations) and Y (the alumni's critical thinking); then found the determinant variable among the four independent variables in question. The time of this study was the 2nd half of 2014/2015.

1. Statistical Hypothesis

In the ordinal order, the variable of the alumni's critical thinking, there was one dominant level among four categories: low, medium, high and very high. Among the 4 independent variables, there were positively significant determinants on the critical thinking of alumni in the ICT-based program. In other words, the regression coefficient predictor determinant (b_1) was significantly positive. Statistical hypothesis proposed were:

H_0 : $b_1 = 0$ (there is no determinant influence on critical thinking of alumni of BEITP for teachers through open/distance learning)

H_1 : $b_1 \neq 0$ (there is a determinant influence on critical thinking of alumni of BEITP for teachers through open/distance learning)

The effects on individual or multiple variables were discovered by looking at the value of b in the determinant variable. Furthermore, the significance of value b will be tested by t-test. T significance was seen in its value. If b was positive, and t was significant at an error rate of less than 0.05, the hypothesis H_1 would be accepted.

2. Instruments and Data Analysis Techniques

The data of this study was quantitative data in the form of numbers; Ordinal data was data that was expressed in forms of categories and ranked. Ordinal scale used was the ranking scale (Likert Scale) that consists of statements and answers with low, medium, high and very high corresponding to measurement purposes. Data were collected through a self-rating scale consisting of 32 items that had been proven its validity and reliability; Score validity 0.199 to 0,827, with a reliability index Cronbach's $\alpha = 0.93$.

Data on values of variables were analyzed by using frequency distribution and linear regression (double) with Stepwise Model. The collected instrument items used the calculation of factor analysis. Furthermore, the researcher created the model of relationship (causal models). The patterns of the independent variables influence (determinant) on the dependent variable was tested by F test at the 0.05 level. This calculation was carried out with SPSS version 20.

In the testing concept model, the determinant coefficient from the independent variable to the dependent variable was calculated. The calculation result of the determinant coefficient from four independent variables in this study on the dependent variable was adjusted by

R² coefficient. If the significance r was less than or equal to 0.05, this model was declared significant, as X₁₋₄ (selected) influenced Y, as much as adjusted R² coefficient.

FINDINGS AND DISCUSSION

1. Descriptive Analysis

After the data were screened by self-rating scale which consisted of 40 items, the data were then reduced to 5 and were analyzed descriptively with the help of the SPSS for windows program version 20. The result is shown in Table 1 below.

Table 1 Variable Statistical Index

	Mean	Med.	Sd.	Min.	Max.
X ₁	2.7273	3.0000	.51676	2.00	4.00
X ₂	2.5758	3.0000	.61392	2.00	4.00
X ₃	2.7273	3.0000	.57406	1.00	4.00
X ₄	2.4848	3.0000	.83371	1.00	4.00
Y	2.4394	2.5000	.47611	1.50	3.25

Based on the result of the descriptive analysis as presented in Table 1 above, most of the respondents (alumni) have learning motivation (X₁) at the medium rate, readiness to enter the ICT community (X₂) at the medium rate, mastery of the prerequisite (previous lecture materials) (X₃) at the mid-high rate, and teacher's ability in preparing instructional contexts to yield a new situation (X₄) at the medium rate, and students/alumni's critical thinking (Y) at the high rate.

2. Hypothesis Test

The next analysis was to know whether the four free variables (X₁₋₄) affected the students/alumni's critical thinking habit (Y). If it was true, how many models there were and how significant was their models? The result of the regression analysis is shown in Table 3 below.

Table 3 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.726 ^a	.527	.512	.33274
2	.862 ^b	.744	.727	.24886
3	.897 ^c	.805	.785	.22069
4	.913 ^d	.834	.810	.20757

a. Predictors: (Constant), X₄
b. Predictors: (Constant), X₄, X₂
c. Predictors: (Constant), X₄, X₂, X₃
d. Predictors: (Constant), X₄, X₂, X₃, X₁

The result of the hypothesis test by regression analysis as presented in Table 3 above shows that 4 models were discovered; Model 1 Instructional context which yields a new situation (X₄) affected the alumni's critical thinking habit (Y): R gained = 0.726 and adjusted R Square = 0.512 or 51.20%. Model 2 Instructional context which yields a new situation (X₄) and Alumni readiness to enter the ICT community (X₂) affected the alumni's critical thinking habit (Y): R gained = 0.862 and Adjusted R Square = 0.727 or 72.70%. Model 3 Instructional context which yields a new situation (X₄), Alumni readiness to enter the ICT community

(X_2), and Prerequisite, i.e., the mastery of previous lecture materials (X_3) affected the alumni's critical thinking habit (Y): R gained = 0.897 and Adjusted R Square = 0.785 or 78.50%. Model 4 Instructional context which yields a new situation (X_4), Alumni readiness to enter the ICT community (X_2), Prerequisite, i.e., the mastery of previous lecture materials (X_3) and Student learning motivation (X_1) affected the alumni's critical thinking habit (Y): R gained = 0.913 and Adjusted R Square = 0.810 or 81%. Therefore, the hypothesis which asserted that there was a determinant for the alumni's critical thinking had been supported by data.

Table 4. ANOVA^e

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	3.822	1	3.822	34.518	.000 ^a
1 Residual	3.432	31	.111		
Total	7.254	32			
2 Regression	5.396	2	2.698	43.562	.000 ^b
2 Residual	1.858	30	.062		
Total	7.254	32			
3 Regression	5.841	3	1.947	39.978	.000 ^c
3 Residual	1.412	29	.049		
Total	7.254	32			
4 Regression	6.047	4	1.512	35.091	.000 ^d
4 Residual	1.206	28	.043		
Total	7.254	32			

a. Predictors: (Constant), X_4
b. Predictors: (Constant), X_4 , X_2
c. Predictors: (Constant), X_4 , X_2 , X_3
d. Predictors: (Constant), X_4 , X_2 , X_3 , X_1
e. Dependent Variable: Y

Table 3 Anova above explains four models: Model 1 Instructional context which yields a new situation (X_4) affected the alumni's critical thinking habit (Y): F gained = 34.518 at the significant level 0.000. Model 2 Instructional context which yields a new situation (X_4) and Alumni readiness to enter the ICT community (X_2) affected the alumni's critical thinking habit (Y): F gained = 43.562 at the significance level 0.,000. Model 3 Instructional context which yields a new situation (X_4), Alumni readiness to enter the ICT community (X_2) and Prerequisite, i.e., the mastery of previous lecture materials (X_3) affected the alumni's critical thinking habit (Y): F gained = 39.978 at the significant level 0.000. Model 4 Instructional context which yields a new situation (X_4), Alumni readiness to enter the ICT community (X_2), Prerequisite, i.e., the mastery of previous lecture materials (X_3) and Student's learning motivation (X_1) affected the alumni's critical thinking habit (Y): F gained = 35.091 at the significance 0.000. The rate of significance level in the four models was 0.000 which is smaller than 0.05. Therefore, the four predictor variables affected the alumni's critical thinking habit positively and significantly.

3. Discussion

The result of this research obtained 4 models: Model 1 Instructional context which yields a new situation had affected the alumni's critical thinking habit at 51.20%. The instructional process should have been able to create a conducive class atmosphere to support the existence of quality instructional process, which results in meaningful learning for students, and in turn facilitates the optimal development of competence and potentials of the students, including

their critical thinking habit. In an instructional process, the important thing is not only the materials to be taught or whoever the teacher is, but how the materials are taught, how the teacher creates a conducive class atmosphere in the instructional process. Many factors need to be attended to in creating a quality and conducive class atmosphere in order to improve students' achievement. The factor to be attended to according to Reference (Muhtadi, 2005) are among others, the instructional approach should be orientated to the way students learn (student centered); teacher's appreciation to the students for their active participation in the learning process. Teachers should be democratic in administering class activities, each problem that arises should better be discussed dialogically, various kinds of learning resources can be easily accessed or learned promptly. Class environment should be set in such a way that motivates students and leads to appropriate instructional process.

The result of the research by Reference (Astuti, 2014) concluded that students' learning motivation varied: 8% were at the high category, 72% at the medium category, and 20% at the low category. Therefore, the motivation of most students (72%) was at the medium category. Meanwhile, Reference [24] asserted that learning motivation gave a small effect (2%) on the students' learning result. In contrast, however, Reference (Irianti, 2012) in her research concluded that learning motivation affected positively on the 2008 students' achievement in the Entrepreneurship subject at FKIP Pendidikan Akuntansi, Universitas Muhammadiyah, Surakarta with the effective contribution of 6.9%. Sovia, (2015) in her research found that the rate of students' learning motivation after taking a class was at the very high category, which was contrary to the research finding of Purwanti (2012) which indicated that the learning motivation of most students was low. One of the things that needs teacher's attention in order to improve students' learning motivation was by applying a precise instructional model (Sanaky, 2016). Unlike this finding, learning result being measured was the critical thinking habit, while the position of learning motivation has just played its role when three variables were followed: the instructional context which yields a new situation, alumni's readiness to enter the ICT community, and the prerequisite, i.e., the mastery of previous lecture materials. The contribution of motivation to critical thinking habit was 2.50%.

The alumni's readiness to enter the ICT community in this research evidently went with the instructional contexts which brought about a new situation contributed 72.70%; in other words, the alumni's readiness to enter the ICT community alone contributed 21.50%. This research agrees with the premise developed by Johari (2004) who revealed that an ICT project where children read books and then use email communication to exchange responses with other learners will support critical thinking. Education and instruction landscape is more and more challenged by rapid changes through technological advances and future knowledgeable society, in which manpower is the key that makes education an integral part of development with the ICT as the primary motor in changes and advances (Johari, 2004).

Skills involved in critical thinking into three kinds: metacomponent, performance component, and acquired knowledge component. The study on critical thinking combines educational tradition, philosophy, and psychological reasoning. Critical thinking comprises mental, strategic, and representational processes that people use to solve problems, make decisions, and learn new concepts (Sternberg, 1986). Therefore, it is appropriate if the mastery of previous lecture materials (prerequisite) becomes an absolute requirement for skill development and critical thinking habituation. Knowledge and experience are prerequisite to critical thinking in the area in which the thinking is done (Russel, 1963).

This new finding is very much useful for educational quality management in terms of effectiveness and productivity of Higher Education. The primary determinant for the habit of critical thinking is teacher's role in developing instructional contexts which bring about a new

situation. Despite being undeveloped, the important characteristic of management approach of the ICT enables teachers to make a reflection on the process of planning, implementation, and evaluation of the instructions either individually or in groups, for example, in a conference and a joint product of on-line electronic self-assessment. Stimulating teachers and students to think about teaching-learning processes (ICT-based instructions) may make some aspects of teacher's pedagogy more accurate, effective, and efficient (Slameto, 2016). This new finding will be very much useful for educational quality management in terms of effectiveness and productivity of Higher Education as executor of the ICT-based PJJ Program.

CONCLUSION

This research has measured critical thinking habit of the alumni of O/DL, the BEITP, SWCUSalatiga. It was evident that O/DL the BEITP has graduated most of its alumni with critical thinking habit at a high rate. The alumni's critical thinking habit was affected by the instructional contexts which brought about a new situation (Model 1) at 51.20%. The instructional contexts with a new situation and the alumni's readiness to enter the ICT community (Model 2) affected the alumni's critical thinking habit at 72.70%. The instructional contexts with a new situation, the alumni's readiness to enter the ICT community, and the prerequisite, i.e., the mastery of previous lecture materials (Model 3) affected the alumni's critical thinking habit at 78.50%. The instructional contexts with a new situation, the alumni's readiness to enter the ICT community, and the prerequisite, i.e., the mastery of previous lecture materials, and students' learning motivation (Model 4) affected the alumni's critical thinking habit at 81%.

This new finding will be very much useful for educational quality management in terms of effectiveness and productivity of Higher Education as executor of the ICT-based PJJ Program. The primary determinant for critical thinking habit is the teacher's role in developing instructional contexts which yield a new situation. The alumni's critical thinking habit of 51.20% was determined by the teacher's role in developing instructional contexts which yield a new situation. Therefore, it enables teachers to make a reflection on the process of planning, implementation, and evaluation of the instructions either individually or in groups. The management is focused on the teachers in developing context-based instructional strategy, alumni's readiness in entering the ICT community, the prerequisite, and student's learning motivation.

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