Student Motivation in Technology Application-based Online Tutorials in Educational Statistics Course

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ABSTRACT— ***This research was conducted due to the lower of student's learning performance on Educational Statistics course. Technology application based online tutorials was become a solution for the matter, because through this tutorial, student could correspond the subject with their daily lives, so that student motivation for learning the subject material could be increasing. A high motivation was indicated by the increasing of student learning performance. This research purposed to know how student's motivation in participating Technology Application Based Online Tutorials on Educational Statistics course along with how the motivation's influence to student learning performance after had participated the tutorial. The research subjects were 36 student who participated on online tutorial of Educational Statistics course in the period of online tutorial 2012. 1. The Researcher provided the online questionnaire to know the student's motivation. Data Analysis of student's Motivation was conducted in qualitative descriptive. While for knowing the motivation's influence to learning performance, researcher performed the regression analysis. The research output showed that after had participated within this tutorial, student's motivation in learning the course was increasing. In addition to that, on this research was looked that motivation had affected the learning motivation which amounting to 88,7% by the following regression equation y=-116.506+1.769 x.***

Keywords— Motivation , Online Tutorial, Technology Application, Educational Statistics

1. INTRODUCTION

Statistic was a scientific method, which learned the data collection, arrangement, calculation, and analyzing along with a valid conclusion based on the conducted analyzing and rational decision-making (Herryhyanto, 2008). The Statistic contained of multiple applications, one of them called as Educational Statistics in the education field. Faculty of Teachers Training and Education – Open University (FKIP-UT) provided the subject PEMA4210 of Educational Statistics that was joint subject on entire the study program of FKIP-UT.

Relating with the learning performance of Educational Statistics, FKIP-UT student had a related problem with this matter. Based on data of Examination Center in 2010, showed that the subject value of Educational Statistics of Non Pendas program FKIP UT for registration period 2010.1 was low; it was indicated on the total point under C more than 50%. More over for Math Education program for whom had a profession as math teacher, which amounted to 87% having a point under or equalized with C. Based on the interview conducted with 10 students, they had problems in compiling the data on table form and diagram, along with analyzing and interpreting the data. In addition to that, they also had a problem to learn normal curve subject and other curves, because the subjects were not applied on their daily lives.

As well as the ICT's Development, media that was using technology could be an option for applying the concept of learning process. E-Learning or Electronic learning was a concept of learning process by using the ICT, particularly in using the internet based media (Darmayanti, 2007). As a Remote, Open University (UT) provided the learning assistance service were following online tutorial, online tutorial was an application which came from *E-learning*. Online Tutorial was a internet based tutorial service which offered by UT and participated by student through internet network.

However, on the application, student's motivation in participating the online tutorial was still less. Noviyanti (2006) stated that the lack of student's motivation was indicated on student's participation of FKIP UT to participate on the online tutorial, which less than 5%. Noviyanti added the student's excuse for not participating in the online tutorial was an initiation subject that only had a form of text, non-understandable and unable to motivate a student.

One of method for overcoming the problem was by utilizing the technology application in learning. Technology application based math learning, basically, was learning based and oriented upon the connection of daily live math concepts, and re-applied the math concept that had been owned by learners to solve their daily problems.

This research purposed to know how student's motivation to participate the Technology Application Based Online Tutorial upon Educational Statistics subject along with how the influence to student's learning performance after had participated the tutorial.

2. LITERATURE

2.1 Constructivism

The origin word of constructivism, namely "*to construct*" which meant "to form". Constructivism was one of philosophy ideology, which had a view, that the knowledge we had as the result of our construction or our self-forming. The constructivism experts agreed that math learning involved actively manipulation of the meaning that not only composed from numbers and formulations (Suherman, 2003).

According to Gagnon and Collay in the Pribadi (2009), declared that constructivism approach referred to human assumption to develop their selves by involving whether in the activity in personal or social to build the knowledge. According to Piaget (Suparno, 2001), constructivism theory explained that someone's knowledge was resulted from self-forming. Thus, learning constructivism was a learning that based on an ideology where the knowledge acquiring came from the learner itself by building the knowledge based on the owned knowledge through any actions and interaction with its environment.

Relating with the Statistic, with this theory, learner might learn Statistic by practicing the owned subject of real data which they collected as they selection. Learners were required to collect data regarding the topic they interested. For example, by collecting data or compiling short questionnaire with variables they selected which connected with their daily activities. They were expected to investigate and depicting the data whom they collected by tool assistance. Obviously, they were expected to be able to analyze the data (Libman, 2010).

By selecting this model, Statistic was required to be done with a specific emphasis on context, whether on the learning and evaluation stage regarding any subjects had been learned. Learner could practice what they had learned by conducting analysis from the self-collecting data. This training formed the important part of related evaluation program that related to the authentic data. According to Libman (2010), there were several matters needed some attentions within Statistic learning process with constructivism such as practical signification, complexities and challenge, relevancy and motivation, relationship and transfer along with learner's empowerment.

2.2 Motivation

The development of learner's learning motivation upon learning process, whether in the classroom or online through *E-learning* system, could be seen as one of method to increase a learning performance. The motivation itself originated from Latin language "*movere*" which meant as driving or moving. According to Irawan (Susanti, 2007), motivation was defined as a someone's desire or will to increase any effort for accomplishing target or result.

Keller (1987) has developed a four-factor theory to explain motivation. The first is attention (A), the second relevance (R), the third confidence (C), and the fourth satisfaction (S). The model also contains strategies that can help an instructor stimulate or maintain each motivational element.

Attention Factor: A student's attention must be aroused and sustained. This category also included things that related to curiosity and sensation seeking.

Strategies

- Perceptual Arousal. Gained and maintained the student attention by the usage of novel, surprising, incongruous, or uncertain events in instruction.
- Inquiry Arousal. Stimulated the information seeking behavior by posing, or having the learner generate questions, or a problem to solve.
- Variability. Maintained the student interest by varying the elements of instruction.

Relevance Factor: After the student's attention was gained, a student might wonder how the given material related to their interests and goals. If the content was perceived to be helpful in accomplishing one's goals, then they are more likely to be motivated.

Strategies

- Familiarity. Used concrete language and used examples/concepts that are related to the learner's experience and values.
- Goal Orientation. Provided statements or examples that presented the objectives and utility of the instruction and either presented goals for accomplishment or have the learner define them.
- Motive Watching. Used teaching strategies that matched the motive profiles of the students.

Confidence Factor: students must know that they would probably be successful before completing a given task. They must feel somewhat confident. Success was not guaranteed and people enjoyed a challenge. However, the challenge couldn't be too difficult.

Strategies

- Learning Requirements. Helped students to estimate the probability of success by presenting the performance requirements and evaluative criteria.
- Success Opportunities. Provided the challenge levels that allowed the meaningful success experience under both learning and performance conditions.
- Personal Control. Provided the feedback and opportunities for control that supported the internal attributions for success.

Satisfaction Factor: If the outcomes of a learner's effort are consistent with their expectations and they feel relatively good about those outcomes, they will remain motivated.

Strategies

- Natural consequences. Provided opportunities to use newly acquired knowledge or skill in a real or stimulated setting.
- Positive consequences. Provided a feedback and reinforcements that would sustain the desired behavior.
- Equity. Maintained the consistent standards and consequences for task accomplishment.

2.3 The Application of E-learning on Online Tutorials

E-Learning was an learning activity that utilized a network (internet, LAN, WAN) as the method of delivery, interaction, and facility along with it was supported by multiple forms of other learning services (Brown, 2001). This matter had a line with Clark (2008) who stated that E-Learning was any instruction submitted on computer through CD-ROM, Internet, or having any interaction or figure as follow: 1) Contained a relevant subject with learning object; 2) Used instructional method such as example and practice to assist the learning; 3) Used media elements like words and pictures in submitting the subject and method; 4) Designed by instructors guidance (synchronous E-Learning) or self-designed (asynchronous E-Learning); 5) Built a new knowledge and skill that had a relationship with individual learning purpose or increasing the organization's performance.

On the remote education, learning process was extremely affected by student's independency of learning. To assist the student's succeed, remote education institute provided the learning assistance service which one of them was tutorial. As well as the ICT's development, in addition the face to face tutorial, it was also available any tutorial by using internet which called as online tutorial. This tutorial type was one of application sample of E-Learning within tutorial process.

According to Becta (Hanafi ,2008), E-Learning usage within online tutorial could enhance the learning's flexibility and quality because it was able to: 1) Provide access to multiple learning resources; 2) Provide a control to student upon where and when they wanted to learn; 3) It enabled student to learn by their own speeds; 4) Provide student on their adjustable environment to fulfill their own learning requirement; 5) Create any environment which promoted an active approach of learning; 6) The increasing of communication support between tutor and student and among students; 7) Provide a feedback more often and on time such as valuation via computer, and positive strengthening; 8) Motivate students through any proper using of interactive teaching material; 9) Support and encourage the learning collaborative; 10) Support student to take responsible upon their own learning.

Online Tutorial of Open University was an Internet Based tutorial service which offered by Open University and participated by students through internet network. This tutorial was conducted by tutor whether on the Central Open University whereas on UPBJJ-UT by providing 8 times of initiation included giving 3 assignments for tutorial student during tutorial period.

2.4Technology Application

Rachman (Sukestiyarno, 2008) defined on the daily lives knowledge application, or the knowledge application towards other knowledge, so that it gave a benefit in this life and called as technology application. The link of math abstract subject was searched by daily lives application or the science application of other science, for example by teaching the abstract subject of numbers row was linked with cell fusion or radioactive disintegration, teaching the statistic measure of central tendency related with class progress report or criminal report etc.

In the technology application based learning activities was emphasized to promote the learner in order to accomplish academically understanding either including or excluding the learning environment context through real problem or situated solving. The learning characteristic were following: 1) Based on technology application; 2) Through concept understanding which owned by students, students were demanded to know steps or methods to solve the problems; 3) Conducted in the multiple problem situations; 4) Related the learner in the multiply life contexts; 5) Used the learning and group method in the computer class; 6) Used the authentic assessment (Carnoto, 2009).

3. METHODOLOGY

This research was conducted based on the period of online tutorial, namely March 14th ,2012 – May 8th , 2012, using the online tutorial facilities in the Open University. The subject of this research are 36 students. To know the student's motivation, it was developed the online questionnaire and ended by tutorial. The research's instrument referred to ARCS Model with the following indicators:

a. Attention
1) To participate actively Online Tutorial
2) To give respond for the initiation subject
3) To use entire facility of Online tutorial
4) To communicate with other tutor and students
5) To search information regarding the non-understandable matters
6) To discuss the subject
7) To ask any question regarding the non-understandable subject on discussion forum
8) To answer a question when any question on discussion forum
9) To inquiry regarding the non-understandable subject to tutor via *e-mail*
10) To complete the assignments on time
11) To complete the assignments correctly

b. Relevancy
1). To connect the assignment with the purpose/interest
2). To use the multiply alternative for completing the assignments
3). To complete the assignments by using its experience/occupation
4). To integrate the activity/occupation in understanding the subject

c. Confidence
1). Confidence to participate the online tutorial
2). Confidence to discuss
3). Confidence to work any assignments
4). Confidence to work any trainings

d. Satisfaction
1). Satisfaction to participate the online tutorial
2). Satisfaction to discuss
3). Satisfaction on the given subject

In addition measuring the motivation, researcher also developed learning performance test, which had been given to student by the end of season. The given test was the outlined test, which had been tested on its validity, reliability, different force and difficult level.

The output data of student motivation questionnaire during the learning process was analyzed by using percentage. The regression analysis was used for knowing the motivation influence to student learning performance. The population model of regression linear relation was $Y = \beta_0 + \beta_1 X + \varepsilon$.

4. RESULT AND DISCUSSION

4.1 Student Motivation in Participating the Online Tutorials

By the end of session, students were required to fill in the online questionnaire. The purpose of questionnaire filling was to know their motivation during this tutorial participation. From 35 of developed points, there was 9 number had a negative statement.

Table 1: Motivation Instrument Percentage

No	Factor	Percentage				
		5	**4**	**3**	**2**	**1**
1	*Attention*	23%	38%	15%	16%	8%
2	*Relevance*	23%	43%	16%	12%	6%
3	*Confidence*	26%	39%	16%	11%	8%
4	*Satisfaction*	29%	41%	11%	11%	7%

From Table 1 on Motivation instrument percentage, it was showed that more than 50% student gave an agree and disagree statement. While less than 25% students answered with disagree and extremely disagree statement. Most student gave a disagree and extremely disagree statement to instrument, which had a negative statement.

Relating with the Attention factor, student declared that they were actively participated on this tutorial. In addition to that, they also actively participated on the given discussion. In this case, they discussed on the subject application of their daily lives. One of them discussed regarding the variant application on their daily lives. They connected the variant

level that was connected with stock price. students were involved as if they were investor. The stock price was extremely varied attracting the risk seeker investor because had a mayor opportunity to gain the benefit by the consequence of mayor loss also. Therefore, besides it was required the average value which represented the value group, it was also required to know the variant level.

Student's motivation of participation in the online tutorial was contradicting with Noviyanti's statement (2006) stated that student's participation to participate the online tutorial was less than 5%. In addition to that, this research output was contradicting with Susanti's statement (2007) which stated that the lower motivation was showed in the application of online tutorial, it could be seen from the lower student participation. Susanti connected motivation with the usage ability of learning technology on student. The lower student participation of online tutorial also connected with the bustle activities where all students were working people. The student's bustle meant that student unable to manage their time properly for accessing the online tutorial.

For any instrument was included the category of relevance, gained the quite mayor result for positive answer of student. From table 1 Motivation Instrument Percentage was showed more than 66 % of student giving a positive statement for instrument contained how student's motivation related with online tutorial activities related with daily activities as teacher. In the line with Libman's statement (2010) who stated that it related with statistic learning, learner practiced the gained subject of real data according to their selections. In addition to that, Libman also added that in the learning process, learners must truly assume this problem as their own problem. This matter would cause them personally evaluated in learning the concept and principle, so it benefited to motivate learner for developing, or changing and reconstructing their concept and had a clear idea on the relevant knowledge context, they would try to gain the knowledge.

In this tutorial, student connected daily lives subject. They connected the normal distribution subject with value percentage that students gained which conversed into the point of z, learned the average by payroll system, location sizes subject, which was connected with scholarship dividing based on student parent's income, or connected the slope test to know the sales progress of annual product.

Other example was when learning the location sizes (median, quartile, decile and percentile). The understanding on the location sizes was useful when student required the available values on the frequency distribution regarding student parent's income, which divided into four parts. This dividing was required relating with government subsidized dividing on the education world. About 25% of the lowest income would be given as scholarship that amounted to Rp.200.000, 25% above will be given Rp. 150.000, the rest of 25% was given Rp. 100.000 and 25% of highest income will be given Rp. 50.000. With such requirement, student would use the location measure to answer it. In this case, student would always be motivated because assumed that learning the subject was a needs. Therefore, by the owned data processing skill, would add their knowledge and eased them to accomplish academically understanding.

Relating with the confidence, students looked were confidence in participating the tutorial and making any opinion in the discussion. It was suitable with the focus of constructivism which acted as the thinking content and more involved the formal operation compared than thinking logic. Constructivism might cause any thinking along with the new ideas stimulation. Including the Piaget concept on accommodation and assimilation, Ausubel concept stated on the meaning learn, and *post empiricist* on philosophy science (Yeany in Cobern, 1996).

The similar matter was looked on the instrument result, which related with the satisfaction. Based on the questionnaire, students were looked satisfy to participate the online tutorial. One of instrument gained the highest score was discussion satisfaction. The online discussion was conducted by the related topic of subject application on the daily lives. On this discussion forum, students were quite actively participating the discussion. To maintain the motivation, tutor followed the advice as told by Keller regarding the satisfaction in the ARCS model. They were giving a compliment for student who asking a question and respond in the discussion forum.

This matter was suitable with the Bruner's statement on reinforcement. Bruner (Darmayanti, 2007) stated that reward or compliment forms that usage method was needed to be thought in the teaching process. Because the educator admitted that, sometime, extrinsic reward might change a drive had an intrinsic nature. Thus, the educator's compliment could be extrinsic drive, and succeed in problem solving becoming the intrinsic drive.

4.2 Motivation Influence to Learning Performance

The result was obtained from this influence test, namely the amount value of motivation influence to student's learning performance.

Table 2: Output *Coefficients* for Motivation Influence Test

Model		Non-standardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	-116.506	11.599		-10.045	.000
	Motivation	1.769	.108	.942	16.356	.000

a. Dependent Variable: performance

By reading the Table 2 Output *Coefficients* for Influence Test was obtained a value a=-116.506 and b = 1.769, so it resulted a regression equation y=-116.506+1.769 x.

Table 3: Output *ANOVA* for Motivation Influence Test

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	8498.678	1	8498.678	267.533	.000[a]
	Residual	1080.072	34	31.767		
	Total	9578.750	35			

a. Predictors: (Constant), motivation
b. Dependent Variable: performance

The tested hypothesis was :

$H_0 : \beta_1 = 0$ (non-linier regression equation meant that motivation did not affect to learning performance)

$H_1 : \beta_1 \neq 0$ (linier regression equation meant that motivation affected to learning performance)

The further step was by viewing Table 2 output *ANOVA* for motivation influence test, obtained a *sig* value amounted to 0%. The value lowered than 5%. Therefore, that H_0 was refused. So that, the linier regression equation meant that motivation affected to learning performance.

Table 4: Output *Model Summary* for Motivation Influence Test

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.942[a]	.887	.884	5.636

a. Predictors: (Constant), motivation

b. Dependent Variable: performance

Furthermore, for knowing the influence amount was obtained. Determination coefficient value could be seen on value R Square on Table 3 output *model summary* for motivation influence test was obtained 0,887=88,7%. The value showed that motivation affected to learning performance which amounted to 88,7%.

Based on the obtained result, it was looked that motivation had a very huge influence for the success of learner, which amounted to 88,7 %. The matter was suitable with McClelland (Sfenrianto, 2009) which explained that motivation had a contribution until 64% regarding the learning performance. While the study was conducted by Fyans and Maerh (1987) showed that among three factors, namely motivation, family background and school condition, then motivation factor was more dominant to affect the learning performance. In addition to that (Tella, 2007)) also indicated that any significant influence between motivation and learning performance of learner.

Ames (1992) declared that the high motivation was very needed in the *E-learning*. While Coccea (2010) showed, that motivation had a mayor influence to the learning quality through *E-Learning.* Keller (2000) declared that the high motivation was very important in the benefit of *E-learning*. In addition to that, Keller added the tutor's role was very affected to learner's motivation in learning.

In Indonesia, there was a research related with motivation of learner which had been done, there were Harjo dan Badjuri (2000) on their researches regarding the motivation influence to learning performance of elementary school student, that 1) there was a significant influence between performance motivation with student learning performance, 2) there was a significant influence between learning method with student learning performance, and 3) there was a significant influence between motivation and learning method /habit with student learning performance.

Based on this research, it could be concluded that for increasing the student's motivation, it was needed a proper method in order to the student were willing to spare their times to keep participating in the online tutorial. Tutorial based on technology application had capable to increase the student's motivation because had made this tutorial

becoming the student's requirement. By connecting the subject with the obtained data would ease the student in mastering the subject.

5. CONCLUSION

The conclusion of this research that technology application based online tutorial could increase the student's motivation. In addition to that, on this research showed that learning performance which amounted to 88,7%. This research indeed was not yet observing the student's resident and economic condition. For that reason, it was held a further observation regarding the benefit of online tutorial for student based on their resident location and economic condition. So that, it could be looked how the student's motivation utilized the online tutorial whether located on city and village, along with the student's motivation with poor economic and high economic in utilizing this tutorial.

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