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Education and training strategic management course to improve students' self-directed learning and learning outcomes

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ABSTRACT

The purposes of this study were: i) Developing strategic management of education and training online tutorial; ii) Testing the feasibility of strategic management of education and training online tutorial; iii) Finding out the obstacles in strategic management of education and training online tutorial development process; and iv) Finding the solutions in overcoming obstacles in developing strategic management of education and training online tutorial. This developmental research used the analysis, design, development, implementation, and evaluation (ADDIE) model and involved second year students of the faculty of teacher training and education in the Kupang Region, Indonesia. The instruments used in this study were: i) Validation guidelines for online tutorial material and supporting instruments; ii) Students' self-directed learning questionnaire; and iii) Online tutorial formative test questions. Data analysis used descriptive and inferential statistical test. The results show that the online tutorial: i) Fulfilled the aspect of validity in the excellent category; ii) Fulfilled the effectiveness aspect in the good category; iii) Limitations of the source, difficulties in compacting the content of material and developing discussion questions are the obstacles in developing the online tutorial; and iv) The solutions are (utilize Universitas Terbuka (UT)'s open educational resources (OER), make concept maps, and keep practicing to make question samples and consult the questions made to the experts).

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1. INTRODUCTION

In this particular era of the industrial revolution 4.0, the world of education is in the knowledge age with the extraordinary acceleration of knowledge enhancement, which is supported by the application of digital media and technology called information superhighway [1]–[3] demands that the 'style' of learning activities must be adjusted to the needs at the knowledge age; learning materials must be presented in a more authentic and attractive design so that the students can collaborate with each other to create problem solving [4], [5]. In line with this, the Ministry of Education and Culture emphasizes that the 21st century learning paradigm is focused on the ability of learners to find out from various sources, formulate problems, think analytically and collaboratively, and collaborate in solving problems. Everyone, including students, must have critical thinking skills, knowledge and digital literacy, information literacy, media literacy skills and mastering information and communication technology [5], [6].

Universitas Terbuka (UT) is establishing itself as a cyber university with various innovations that support the learning process. One of the ways of utilizing information technology in learning is online tutorial, an internet-based tutorial service or web-based tutorial. The online tutorial is followed by students via the internet network and is one of the tutorial forms held by UT. The objectives of organizing the online tutorial are optimizing the utilize of the internet network to provide learning assistance services to students, allows the distance learning process in a more communicative and interactive link design, and providing alternative options for students who have access to the internet network to obtain optimal learning assistance services. Students are expected to actively read initiations, respond by asking questions or giving responses, discussing and doing assignments, and taking summative tests at the end of the online tutorial session. The purpose of the online tutorial indicates that the online tutorial service provides opportunities for students to organize themselves independently to learn. This independent self-regulation is known as self-regulated learning. According to Zimmerman [7] in general, self-directed learning has motivation, metacognition, and active behaviour in their own learning processes. These learners individually start and direct their own efforts to acquire knowledge and skills rather than relying on teachers, parents, or other colleagues to achieve academic goals based on perceptions of self-efficacy. Without self-directed learning skills, students are at greater hazard for dropping out or failing because of their learning problems and lack of ability [8]–[10].

The importance of online tutorial services as a learning service for students requires the need for quality tutorial materials as well as an online tutorial approach. It is to ensures the achievement of the goals of online tutorial learning services, such as self-directed learning and student learning outcomes. Especially in strategic management of education and training course, this is a course with the output of students being able to design strategic management training in schools, colleges, and training providers. The most noteworthy aspects in the interactive learning procedure is that the students are given the opportunities to interact [11]. This can be completed between students and students, between students and facilitators or tutors, and between students and e-learning materials. However, based on the results of interviews and analysis of the online tutorial implementation process, it was found that only 79% of students were actively involved in online tutorials. The involvement in tutorial online is the participation of students in answering discussion questions, responding to their friends' discussion answers, and submits the assignments on time. The developed online tutorial material was still limited to material from modules and in the form of text. The less attractive online tutorial material is one of the reasons why students are less interested in participating in online tutorial activities. The use of online tutorial that is charily designed should improve the students' learning activity, as well as the students' independence to initiate associates, discussions, and reflection to advance their learning outcomes. It can be stated that technology-rich learning environment can provide students with great opportunities and abilities to be self-regulated in their learning as it warrants the students to be not only knowledgeable about the pertinent resource selection, but also the management and appropriate usage of the information [12] although the findings show that there are 43% of students who are late in uploading assignments due to difficulties in managing time. In fact, as adult learners, students should already have the self-directed aspects of learning (the choice of what, when, and how long to study) which social media and other technologies provide have significant repercussions in the effectiveness of the user's learning efforts [13].

Several attempts have been made to develop the quality of online tutorials, including research developed by Said and Syarif [14] which aims to evaluate the online tutorial program design by applying problem-based learning. The results of this study show that the design of the online tutorial program involving the problem-based in the research methods course can be regarded as an eligible program in terms of the criteria which are in accordance with the defined research objectives. A number of findings and arguments ranging from the contextual and affective to cognitive factors, are presented to elucidate the incongruity of results e.g. some researchers have argued that the use of such technologies by students does not necessarily entail that they use them for their academic activities [13], [15], [16]. Along similar connections, Paretta & Catalano [17] declared that in-depth observations of students' technology-based practices suggest them to be sometimes of little academic relevance. Observing 730 individual behaviors of students in the library, the result indicated that though 60% of overall behavior was study related; however, 73% of those working on a computer were considerably more likely to be engaging in a non-study behavior like checking e-mails, visiting Facebook, or other websites. Additionally, Hong *et al*. [18] recommended that 'cognitive failure' may also reflect a decrease in the efficiency of perceptual levels of Internet learning. It has been suggested that self-directed learning could provide a more direct route into understanding the actual dynamics of and relationships between learning and technologies [19]. Regardless of a significant level of agreement about the influence current technology affordances could have on self-directed learning (SDL), as is evident from the review of literature, not much empirical evidence is available regarding the impact of technology use on self-directed learning. The present study aims to address the gap by examining the impact of a variety of technologies on SDL, in addition to the students' academic performance and student

engagement. Using a path model to test the interrelationships, the study would add an innovative dimension to the existing body of literature.

The development of strategic management of education and training online tutorial apply the principles of adult education (andragogy), meet the learning needs of students as mature students, and equip students who attend online tutorials to be able to design strategic management training in schools, colleges, and training providers. In that online tutorial, students will learn the strategic education and training system and the application of competency-based training in organizations, especially training institutions. Based on the previous reseraches, they representing both positive and negative correlations of online tutorial with the academic's performance and sel-directed learning. Researchers are interested in developing online tutorial services that help students to obtain independent learning services that help students organize their cognition and attitudes to get maximum learning outcomes.

2. RESEARCH METHOD

This research was a developmental study using the analysis, design, development, implementation, and evaluation (ADDIE) model [20]. Online tutorial materials were developed consist of teaching materials, syllabus, discussion materials, formative test questions and tasks questions. The data source of this research was the second-year students of faculty of teacher training and education of Kupang Region, Indonesia. The instruments used in this study were: i) Online tutorial material validation guidelines; ii) Syllabus and tutorial activity plan validation guidelines; iii) Discussion questions validation guidelines; iv) Multiple choice questions validation guidelines; v) Tasks questions guidelines; vi) Students' self-directed learning questionnaire; vii) Students' self-directed learning questionnaire validation guidelines; viii) Online tutorial formative test questions; and ix) Online tutorial formative test questions validation guidelines.

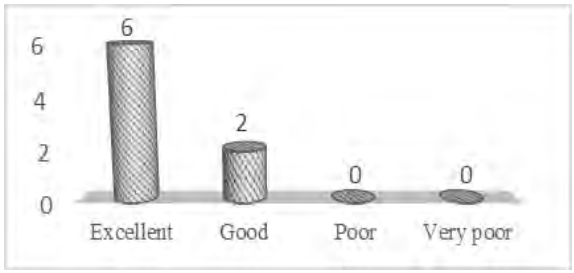
The data obtained in this study were in accordance with the number of instruments used. Data analysis techniques in this study were qualitative descriptive to analyse assessments, suggestions and comments from validators and students' responses. The results of expert validation in the form of ordinal data were analyzed descriptively to see the tendency of assessing the content and structure of the online tutorial as well as students' views of the online tutorial; quantitative descriptive to analyzed student learning outcomes data, and self-directed learning. The results of this quantitative descriptive analysis are presented in tables and diagrams with the rating based on qualitative categorization, and inferential statistical test to test the improvement of student learning outcomes and self-directed learning after attending the online tutorial. The execution of online tutorial is considered to be effective if it meets two predetermined effectiveness indicators, namely: i) The learning outcomes test reach a minimum of 75 or has an average that significantly higher than 75 based on the statistical tests; and ii) The students' self-directed learning reach a minimum score of three or have the average that significantly higher than three based on the statistical tests.

3. RESULTS AND DISCUSSION

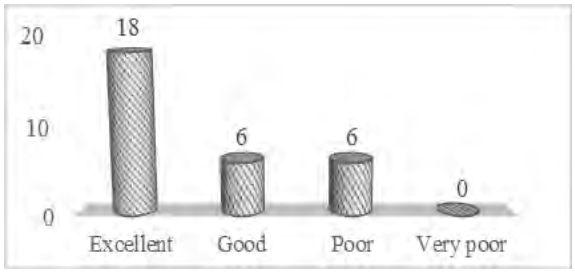
3.1. Development stage

Online tutorial material of strategic management of education and training has the following structure: i) Pre-Session online tutorial materials consisting of pre-session introductions, introductory forums and a space to upload tutorial activity designs. This initial part contains the identity of the course, greetings and introductions of the tutor as well as orientation of the course, description of the course, objectives and learning outcomes of the course, a summary of online tutorial activities and the design of tutorial activities; ii) Online tutorial material sessions 1-8. Each session contains general learning outcomes formulation, specific learning outcomes formulation, general learning resource information, a brief explanation of the material to be studied, exposure to essential concepts/competencies, supporting/enrichment material in the form of links, discussion material, and formative.

The online tutorial materials that have been developed are validated internally by experts. Internal validity testing is done by asking for suggestions and opinions of experts related to the validity of the material, media, syllabus and tutorial activity plan, discussion items, multiple choice items, task items, and the description items. Validation of material, media, syllabus and tutorial activity plan, discussion items, multiple choice items, task items, and the description items was carried out by two experts using an online tutorial material validation sheet. The number of statement items is 28 statements with four answer choices on a Likert scale. The results of the online tutorial material validation and the syllabus validation are presented in the Figure 1(a) and (b).



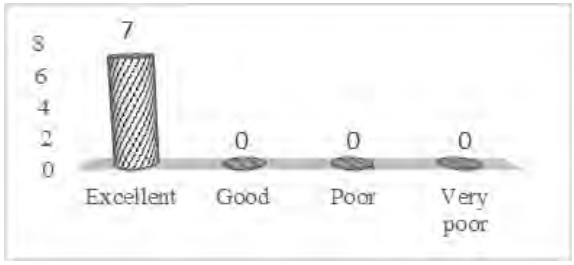
(a)



(b)

Figure 1. Results on (a) online tutorial material validation and (b) syllabus validation

The results of the material validation show (Figure 1a), there are 18 out of 30 items (60%) in the excellent category, six items (20%) are in the good category, and six items (20%) get poor rating. Some remedial notes submitted by the validator are: i) Apperception is not clearly seen yet. In addition, please provide a link between the previous and the next online tutorial material; ii) Regarding material items that are accompanied by examples, please clarify with a case example; iii) Present the discussion material at the level of analysis and evaluation to develop students' self-directed learning. The results of the syllabus validation show (Figure 1b), there are six out of eight question items (75%) in the excellent category and six items (25%) are in the good category. Overall, the syllabus is already good with general conclusions that can be used without revision. The results of the tutorial activity plan validation and discussion questionsvalidationare presented in the Figure 2(a) and (b).



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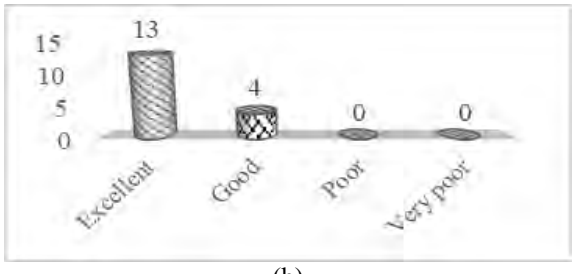
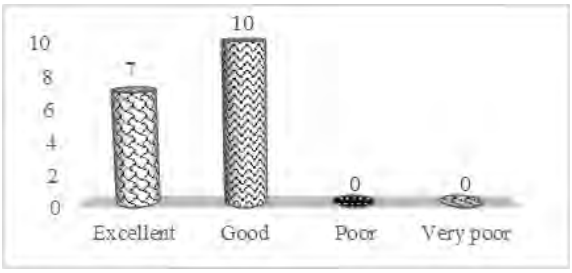


(b)

Figure 2. Results on (a) tutorial activity plan validation and (b) discussion questions validation

The results of the tutorial activity plan validation show (Figure 2a) that there are 13 out of 17 question items (76.5%) in the excellent category and four items (23.5%) are in the good category. Some improvement notes submitted by the validator are; it is recommended that before the tutors give an explanation, students are directed to access material from modules or other learning resources. So that tutors do not find difficulties in giving explanation and students easier to understand the material explained by the tutors. Overall, the tutorial activity plan is already good, with general conclusions that can be used with minor revisions. The results of the discussion questions validation show (Figure 2b) that all items are in the excellent category which indicates the questions have been carefully arranged both in terms of suitability with indicators, meanings, and using Indonesian language well. The discussion material has qualified as a good discussion material that is able to stimulate students' way of thinking to express ideas genuinely. Based on these ratings, the discussion questions were concluded very well and can be used without revision. The results of the validation of multiple-choice questions and task questions validation are presented in the Figure 3(a) and (b).

The results of the multiple choices questions validation show (Figure 3a), in terms of material, construction and language, the questions already have reasonable criteria to be used as formative test questions to measure the achievement of student learning outcomes after attending the online tutorial. The questions are in accordance with the indicators compiled with the correct choice of answers and correct and logical deception. From the construction aspect, the questions are formulated briefly and clearly and contain question words that correspond to the available answer choices. From the language aspect, the questions do not have multiple meanings or interpretations, and use good and correct Indonesian language. Based on these ratings, the discussion questions were concluded very well and can be used without revision.



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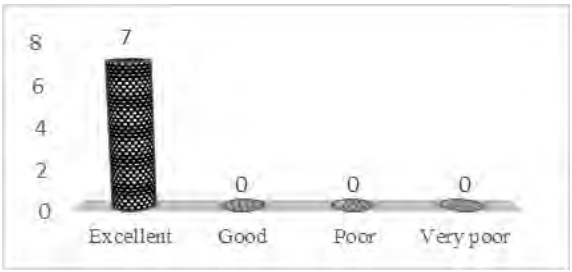

(b)

Figure 3. Results on (a) multiple choice questions validation and (b) task questions validation

The results of the task questions validation show (Figure 3b) that all question items were assessed in the very good category which indicated that the assignment questions had been prepared well, where the assignment questions were in accordance with the indicators, had clear instructions, used good and correct Indonesian language, did not contain multiple meanings/interpretations and were communicative. Based on this assessment, it is concluded that the assignment questions are in the very good category and can be used without revision. Furthermore, the learning independence questionnaire consists of aspects of goal setting, motivation, analysis of learning difficulties, self-efficacy, strategy selection, metacognition, and resource management. From these seven aspects, 70 statement items were developed which were validated theoretically by experts and empirical validation to measure their validity and reliability with 30 students as the subject of Kupang Region students <0.05 so it can be said that all statement items are valid while reliability testing gets Cronbach's Alpha value of 0.823 or reliable.

3.2. Implementation stage

The result of expert validation becomes an improvement record for the material of strategic management of education and training online tutorial which then continued with a limited test. This trial involves ten subjects (S1–S10) with the teacher's background. The trial was done to improve the potential for increased learning outcomes and self-directed learning after learning the online tutorial material. The results of the subject formative test are presented in Table 1 and Figure 4.

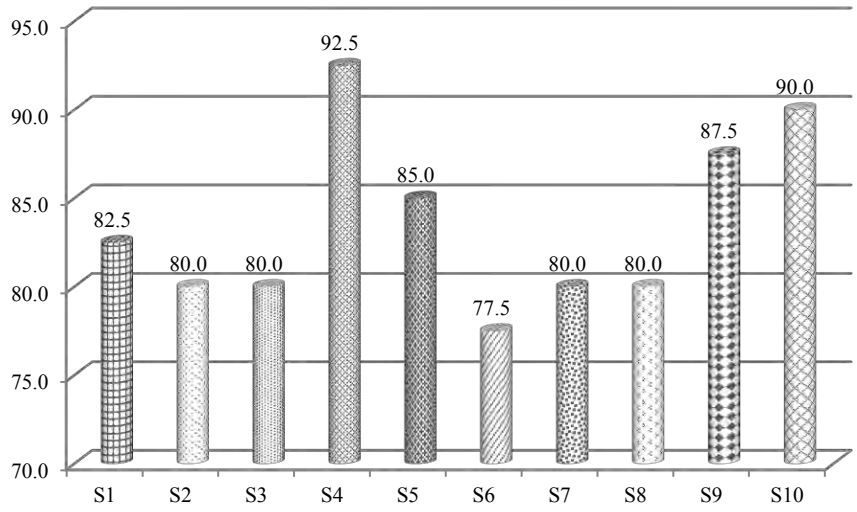

Figure 4. Formative test value bar chart

Table 1. Formative test results

No	Subject	Value
1	S1	82.5
2	S2	80.0
3	S3	80.0
4	S4	92.5
5	S5	85.0
6	S6	77.5
7	S7	80.0
8	S8	80.0
9	S9	87.5
10	S10	90.0
Average		83.5

From the Table 1 and Figure 4, it seems that the results of the formative test of the subject are in good and excellent category. Normality test is conducted further as a prerequisite test for the statistical selection of hypothesis testing. With the criteria, if the probability value (sig.)>0.05 then the H_0 is accepted means that the sample comes from a population with a normal distribution. Normality test result with Kolmogorov-Smirnov obtained the probability value (sig.) for the achievement of the learning outcomes is greater than 0.05 so that H_0 is received which means that the students' achievement of learning outcomes comes from the normal distribution population. Based on the normality test data, the statistics used for the significance testing of the online tutorial learning outcomes used a one-sample t test. With criteria if the value of probability (sig.)<0.05 then H_0 is rejected. Furthermore, the result of one sample t-test of formative test result can be seen in Table 2.

Table 2. The result of one sample t-test of formative test result

	Test value=75					
	t	df	Sig. (2-tailed)	Mean difference	95% confidence interval of the difference	
					Lower	Upper
Value	5.35	9	.000	8.5	4.90	12.10

The probability value (sig.)<0.05 so H_0 is rejected; the average achievement of student learning outcomes in the strategic management of education and training online tutorial is not at the grade of 75. Based on the learning achievement data, the minimum value of formative subject tests is 77.5 with normally distributed data, so it can be concluded that the average value of the student achievement in the strategic management of education and training online tutorial is greater than 75. The students' self-directed learning scores from the questionnaire are presented in Figure 5. The self-directed learning scores of ten subjects is 210 at the lowest and 263 as the highest. The results of self-directed learning scores for each aspect are presented in Table 3.

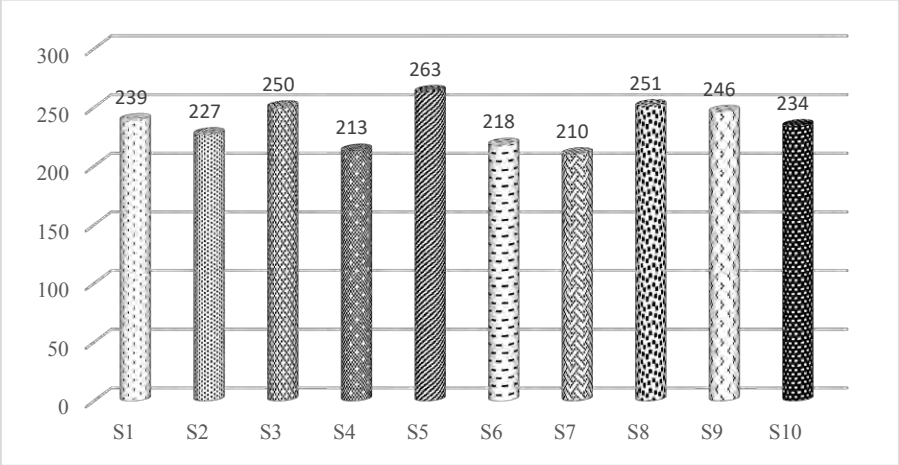

Figure 5. Questionnaire results bar chart

Table 3. The results of students' self-directed learning questionnaire

No	Subject	Score of each aspect										Total score
		GS	M	ALD	SE	SS	MT	RM	PE	UE	SSA	
1	S1	36	56	19	22	33	7	15	35	10	6	239
2	S2	29	49	20	23	32	7	15	36	9	7	227
3	S3	35	53	21	25	36	8	17	38	10	7	250
4	S4	30	45	18	21	30	6	15	33	9	6	213
5	S5	34	58	23	27	38	7	18	39	11	8	263
6	S6	30	47	18	24	30	6	15	33	9	6	218
7	S7	27	45	18	21	30	6	15	33	9	6	210
8	S8	31	54	21	27	36	8	18	39	11	6	251
9	S9	30	52	21	25	36	8	16	39	12	7	246
10	S10	32	49	20	23	32	6	16	37	11	7	234
Average		31.40	50.80	19.90	23.80	33.30	6.90	16.00	36.20	10.10	6.60	
Average of each aspect		3.49	3.39	3.32	3.40	3.33	3.45	3.20	3.29	3.37	3.30	3.36

(GS: goal setting, M: motivation, ALD: analysis of learning difficulties, SE: self efficacy, SS: strategy selection, MT: metacognition, RM: resource management, PE: performance evaluation, UE: understanding evaluation, SSA: self satisfaction)

Theaverage score of self-directed learning of each aspect is above 3.00 and in total has the average of 3.36; acquisiton score for each aspect of self-directed learning and overall are in the good category. Normality test result of students' self-directed learning with Kolmogorov-Smirnov obtained the probability value (sig.) is greater than 0.05 so that H_0 is accepted. Based on the normality test data the statistics used to test the significance of the average of online tutorial self-directed learning use a single sample t test. With criteria if the value of probability (sig.)< 0.05 then H_0 is rejected. The results of the one sample t-test test are presented in Table 4.

Table 4. The result of one sample t-test of self-directed learning

	Test value=3.00					
	t	df	Sig. (2-tailed)	Mean difference	95% confidence interval of the difference	
					Lower	Upper
Value	14.71	10	.000	.35	.30	.41

From Table 5, value of probability (sig.)<0.05 so that H_0 is rejected, which means the average of students' self-directed learning in the online tutorial is not equal to 3.00. Based on the data of students' self-directed learning in the online tutorial with normally distributed data, it can be concluded that the average value of students' self-directed learning achievement in the online tutorial is greater than 3.00. This shows that the strategic management in the education and training online tutorial can increase the students' self-directed learning. Furthermore, a broad trial involving two classes as an experimental class and a control class in a quasi-experimental design. The results of the formative tests in the broad pilot activity are presented in Table 5.

Table 5. The result of descriptive statistical result of formative test

	N	Range	Minimum	Maximum	Mean		Std. Deviation	Variance
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
Eksperiment	29	12.00	75.00	87.00	80.9655	.72173	3.88663	15.106
Control	33	10.00	75.00	85.00	78.9697	.49330	2.83378	8.030

Normality test is conducted further as a prerequisite test for the statistical selection of hypothesis testing. With the criteria, if the probability value (sig.)>0.05 then the H_0 is accepted means that the sample comes from a population with a normal distribution. Normality test showed that the probability value (sig.) for the achievement of the learning outcomes is greater than 0.05 so that H_0 is received which means that the students' achievement of learning outcomes comes from the normal distribution population. Based on the normality test data, the statistics used for the significance testing of the online tutorial learning outcomes used anindependent sample t-test. With criteria if the value of probability (sig.)<0.05 then H_0 is rejected. We can see the result of independent sample t-test of formative test result in Table 6.

Table 6. The result of independent sample t-test of formative test result

		Levene's test for equality of variances		T-test for equality of means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean different	Std. error differenc	95% confidence interval of the difference Lower	Upper
Eksperiment	Equal variances assumed	4.255	.043	2.329	60	.023	1.99582	.85684	.28189	3.70975
	Equal variances not assumed			2.283	50.608	.027	1.99582	.87421	.24045	3.75119

The probability value (sig.)<0.05 so H_0 is rejected; there is a significant difference in the average achievement of students in the experimental class and the control class. Based on the average data, the average value of the experimental class is higher than the control class, so it can be concluded that the average experimental class is better than the control class, which means the strategic management of education and training online tutorial can improve student learning outcomes. Next is the measurement of the student's self-directed learning. The descriptive statistics of the self-directed learning of the two classes are presented in Table 7.

Table 7.Descriptive statistic of students' self-directed learning questionnaire

	N	Range	Min	Max	Mean	Std. Deviation	Variance
SDL_Eksp	29	108.00	156.00	264.00	242.000	20.03568	401.429
SDL_Control	33	28.00	230.00	258.00	242.575	7.18084	51.564

Normality test is conducted further as a prerequisite test for the statistical selection of hypothesis testing. The result of normality test of formative test obtained the probability value (sig.)<0.05 then the H_0 is rejected means that the sample comes from a population with a non normal distribution. Based on the normality test data in the table, the statistics used for the significance testing of the online tutorial learning outcomes used Mann-Whitney U-test. With criteria if the value of probability (sig.)<0.05 then H_0 is rejected. The results of the Mann-Whitney U-test are presented in Table 8.

Table 8. Mann-Whitney U-test of formative test result

	SDL
Mann-Whitney U	385.000
Wilcoxon W	946.000
Z	-1.321
Asymp. Sig. (2-tailed)	.186

The probability value (sig.)>0.05 so H_0 is accepted, meaning that there is no significant difference in the average SDL of students in the experimental class and the control class. At the needs analysis stage, problem identification, and potential and source analysis, it was found that there was a need to develop strategic management of education and training online tutorial materials. From the design stage, the research instruments and online materials were developed consisting of; course competency maps, tutorial or syllabus for the entire online tutorial, tutorial activity plan for eight sessions, and online tutorial material for eight sessions consisting of an introduction in every beginning of the session, presentation of concepts, supporting material or enrichment, discussion materials, formative tests, and assignments for the first, third, and fifth session. The development of materials and supporting instruments is guided by the rules for developing online tutorial materials by the UT, particularly Faculty of Teacher Training and Education.

The results of expert validation show that in general the material, syllabus, tutorial activity plan, discussion questions and assignment materials are in the very good category. This shows that the online tutorial material uses clear language and illustrations, links and sources to facilitate students to learn topics or materials accompanied by concrete examples from other sources easily so that students can easily understand the topics in each session. Discussion questions and assignments that have been carefully arranged both in terms of suitability with indicators, meanings, and using Indonesian language well. The discussion and task material have qualified as a good discussion material that is able to stimulate students 'way of thinking to express ideas genuinely and encourages students' higher order thinking skills. Based on the results of expert validation, the researcher also made improvements according to the input of the experts, such as provide a link between the previous and the next online tutorial material in order to make a clear view of apperception, clarify the materials with a case example, and present the discussion material at the level of analysis and evaluation to develop students' self-directed learning.

To prove that the instruments and materials that have been developed are truly good and have the potential to improve learning outcomes and learning independence, then the implementation stage is carried out. Based on the trial results limited to the sample, it was found that the strategic management of education and training online tutorial was able to improve student learning outcomes. This is because the online tutorial is in accordance with specific learning outcomes, is developed accurately and follows the times, and encourages student curiosity. The online tutorial materials are presented in clear and clear language, accompanied by illustrations, and concrete examples with the support of information from other learning sources to help students learn concepts and models of strategic management, strategic management in human resource development, strategic environmental analysis, strategic planning training, vision, mission, and objectives of the education and training. This finding also prove that the integration of Internet technologies will potentially augment student connectivity in distance education and strengthen the learning environment [20]–[22]. Collaborating in open forums, and in asynchronous mediums such as discussion boards, has been widely accepted as a positive avenue for engaging in deeper understanding [23] and knowledge building [24], [25]. It also confirms that the use of learning technologies has different impacts on students' learning outcomes which may be caused by contextual and cognitive factors [18]. Furthermore, using online course material can enhance student intellectual development [26]. On the other hand, some students reported that their course grades decrease as they spend too much time on online course material. These diverse research results reveal the interest and importance of exploring the readiness for learning technologies and its influences on students' perceptions and behaviors.

The results of the independent learning questionnaire analysis showed that the strategic management of education and training online tutorial was able to increase students' learning independence. This is because the online tutorial material developed is able to help students set goals and targets to be achieved with the existence of a course competency map, making students interested in learning strategic management with illustrations and concept supporting materials, facilitating students trying to overcome difficulties, focusing on solving problems, and discuss with friends and lecturers when solving problems or discussion questions and assignments, as well as allowing students to learn from various sources through supporting or enrichment materials. As we can see that technology can sustain lifelong, self-directed learning beyond the regular classroom. There has been a great rise in the use of information and communication technologies (ICT) in education, owing to the spread of education among masses across the world, where due to the ready availability of ICT enabled tools, self-directed learning can be enhanced. The context of self-directed

learning has now changed with online learning, greater access to technology, personalized learning experiences, and access to information sources that were not available earlier [27]. The online course setting provides an open communication environment for students, which allows the students to express themselves socially and emotionally through communication [28], [29]. Students can interact with each other and with teachers through online learning platforms. Social presence provides the cohesion to sustain students' participation and focus. It also creates a sense of belonging, supporting freedom of expression [30]. The communication among student group members during collaborative activities contributes to students' systematic and critical thinking, which is the hallmark of effective higher education. Instructor expertise, instructor support, and students' self-efficacy influence student satisfaction [31]. The formative test questions at the end of each session help student's measure understanding, assess learning progress, and measure the achievement of their learning goals.

3.3. Obstacles in developing the strategic management of education and training online tutorial

There are several obstacles that researchers encountered in this research activity, including; i) The limitation of source book on strategic management in the education and training. The only source book that the researches easily encountered and used in this study is the module of the education and training; ii) There are quite a lot of difficulties in compacting the content of strategic management in the education and training; and iii) Difficulties in developing material or discussion questions at the evaluation level of higher order thinking skills. Tobe a critical thinker, one needs to be self-directed; and conversely, to be a self-directed learner,one needs to be a critical thinker [29] and it indicates a positive relationship between critical thinking (CT) and SDL. Although, simply transplanting a text-based resource to an online setting by itself does not provide an effective online learning environment [13].

3.4. Solutions to overcome obstacles in the development of online strategic management tutorial

Although there are several obstacles in planning and conducting research, the authors have been able to overcome these obstacles with the following solutions; i) Researchers utilize open educational resources that have been provided by Universitas Terbuka; ii) Researchers create concept maps of all subjects and remain guided by general and specific learning achievement in developing online tutorial tools, online tutorial material, including in developing formative and summative evaluation questions of online strategic management tutorial in the education and training; and iii) Researchers continue to practice making questions samples and consult the questions that have been made with experts, in this case the validator of the questions. Web-based delivery such as online tutorial has influenced the learner's ability to access self-directed learning materials, and with the use of tracking and user-analysis software, it has also brought with it the ability for academics to monitor the degree of student interaction with these activities [32]. Making course resources available online can be a great advantage, especially when distance is an issue [11].

4. CONCLUSION

The strategic management of education and training online tutorial meets the aspects of validity in the excellent category. Strategic management of education and training online tutorial meets the aspects of effectiveness in both categories, based on the results of the questionnaire for students' self-directed learning and student learning outcomes tests. Based on the data of students' self-directed learning in strategic management of education and training online tutorial with normally distributed data, it can be concluded that the average value of students' self-directed learning in the strategic management of the education and training development tutorial online is greater than 3.00. This shows that the online tutorial can increase the students' self-directed learning. Based on the data of learning outcomes achievement, the minimum value of formative subject tests is 77.5 with normally distributed data, so it can be concluded that the average value of student achievement is greater than 75 it means can improve student learning outcomes. Furthermore, when viewed from the comparison with the control class, it can be concluded that online tutorials can improve student learning outcomes but do not have a significant effect on increasing SDL.

Some of the obstacles that researchers encountered in this research were: i) The limitation of source book on strategic management in the education and training; ii) The difficulty in compacting the content of strategic management in the education and training; and iii) The difficulty in developing materials or discussion questions at the evaluation level. Solutions to overcome obstacles in the development of online strategic management tutorial, such as:i) Researchers utilize open educational resources (OER) that have been provided by UT; ii) Researchers make concept maps of all courses and remain guided by general and specific learning achievementin developing the strategic management in the education and training online tutorial; and iii) Researchers continue to practice make question samples and consult the questions that have been made with experts.

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