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Dimensions of Student Learning Motivation in the Context of Online Learning in the Covid-19 Pandemic Era

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Abstract: This study aims to find the motivational dimensions of online learning and the relationship between these dimensions and student performance. Previous studies have studied and found many dimensions of student learning motivation. However, these studies, at least prior to the upcoming era of the covid-19 pandemic, focused on face-to-face learning contexts and not much on online learning contexts. Self Determination Theory (SDT) is used in this study. Data was collected using a questionnaire which was translated from the Motivational Scale based on SDT theory. Confirmatory Factor Analysis was used to analyze the data obtained from the student participants of the English Education Study Program at Universitas Muhammadiyah Jember. The results of this study indicate, first, that there are 3 dimensions or motivational factors for courageous learning: interest, usefulness, and perceived choice. These dimensions explain 69.141% of the measured motivation. Second, overall, these factors were significantly correlated with student performance, but not individually. These results were discussed in the context of SDT.

Keywords: Self-determination; motivation; confirmatory factor analysis; Indonesia

INTRODUCTION

The pandemic hit had shocked every element of society in every corner of the globe, including Indonesia. In addition to the economic sector, the education sector is the second highest impacted sector in Indonesia. The policy to move schools to online was not always a good idea, especially to students' motivation. Although it is safe to say that teachers and students can benefit from the online classroom for its flexibility, they need to be aware of the incoming negative impacts out of online class practices [1]. It is argued that although the decision for online classes was the result of an emergency, it is now time for reflecting on what we missed during the emergency learning.

The absence of direct interaction with teachers and peers may demotivate student's learning. [2] found the student's learning motivation dropped significantly. In their study, the respondents were asked about their learning motivation before and after the pandemic hit. This study, regardless the data collection technique, may suffer from limitations in both conceptual and methodological aspects. How respondents define motivation may seriously affect the validity and reliability of the data. Questioning about how their motivation was before the pandemic might be less appropriate. There is possibility that they forgot how they learned before the pandemic. Even more crucial, the responses could have been the manifestation of maintaining their self-esteem, that is when they described their motivation used to be high but not anymore due to the pandemic.

This question might justify the decline of motivation due to its situational nature, which is the pandemic. Further, this externalization will tend to protect the self-image of the person in question.

Regardless the debatable result on learning motivation, it is still an intriguing topic to discuss during the pandemic due to some reasons. Learning motivation is very likely to be influenced by external factors. First, the online learning is an emergency learning, therefore many teachers have not been well prepared to deliver their learning using the online tools [1]. Second, since the difference in delivery, online learning requires different learning methods and activities, which could also frustrate teachers [3] and demotivate students [4]. Therefore, it is crucial for teachers to invest in more time and effort to attract students into their teaching as well as focus their attention while learning online. Taking into account that online learning which uses the Internet connection via PCs, laptops, and mobile phones, students are very likely to get distracted by notifications or other websites. Indeed, an effective online learning may be achieved differently from that of conventional or face-to-face learning.

Viewing from the students' perspective, the pandemic has forced them to take the online courses. This type of learning requires different strategies and practices. It also needs different motivational skills; meaning that the motivation which used to work on face-to-face learning may not necessarily work here [5]. A study on comparing learning motivation in offline and online learning has been initiated by [5]. They found that to succeed online learning, it is crucial that students implement a more extensive motivational strategies and self-regulation skills. The explanation to this finding is rather because students need to manage themselves, whereas in the offline context, they could rely on their teacher. Also, they need to regulate their own motivation in order to avoid burnout and boredom while learning in isolation. Additionally, students also need to restrain the urge to do other irrelevant activities and to multitask, (learning on LMS while chatting, playing games, watching movies or videos, on the phone), which could lead to losing concentration and focus.

Furthermore, students as they enroll themselves in online courses need to explore certain characteristics in order to succeed the learning. [6] has concluded from the literature that these characteristics include having a strong self-academic concept in which they know what they want to learn and achieve with their academic, being technologically literate particularly for online learning tools, having fluent interpersonal and communication skills especially dealing with online communication, having internal self-locus of control, and having self-directed learning skills. Therefore, students need to consciously plan their learning so as to make it successful.

Motivation is key to successful learning, especially in the context of conventional learning as confirmed by many studies from various perspectives. Today, it is necessary to investigate the effect of learning motivation in online learning. One of the mostly used theories in investigating motivation in both learning contexts is Self-Determination Theory (SDT) by Ryan and Deci [7]. This theory places motivation within the spectrum of intrinsic and extrinsic motivation. Briefly defined, intrinsic motivation is the internal force with the absence of external factors. This involves feeling happy, determined and curious, self-efficacy, and usefulness. In the construct of SDT, this type of motivation is multidimensional. It encompasses aspects such as affective, cognitive, and behavior, or they could manifest in seven dimensions; interest/pleasure, competences, efforts, value/usefulness, pressure, choices, and relationship.

On the contrary, extrinsic motivation is perceived from the outer part of the students. Scores or achievement in a course is an example of extrinsic motivation which could play as a stimulus for better learning, as reported in many studies. Seen from SDT point of view, this motivation has four levels, namely (1) external regulation, referring to people who give reward and punishment, (2) introjection, which refers to the idea of doing something to achieve someone else's wishes, (3) identification that is one who performs his/her duty

because of its utility value, and (4) integration where one gets involved in certain activity because of its significance for his/her self-reward. The last two levels seem to have internal nature but still categorized as external because their purpose of doing is its values or benefits, not the activity of its own self. Further, the first two are classified as controlled extrinsic motivation, while the other two belong to the autonomous external motivation[8], [9].

Recently, many have tried to explore learning motiviation using the self-determination theory (SDT) for its multidimensionality. [10], for instance, highlight that in the context of online learning, SDT is excellent for some rationales, such as it emphasizes the dimension quality of the motivational factors, instead of only revealing how strong or weak certain factor is. By defining motivation as two dimensional variable, intrinsic and extrinsic, a SDT-based study may unveil that extrinsic motivation plays a more significant influence on learning achievement. Previous studies have also revealed how intrinsic motivation affected student participation in online discussion, that is the higher the intrinsic motivation, the more likely students involve themselves in online discussion [10], which will contribute to the learning achievement. The present study therefore formulated some hypothesis, as follows.

H1: In general, intrinsic motivation positively correlates with student learning achievement.

H2: Factors of intrinsic motivation, such as interest/pleasure, competences, choices, and pressure contribute significantly towards learning achievement.

H3: In general, extrinsic motivation correlates positively with student learning achievement.

The complexity of online learning needs to be untangled for us to better deal with it. Given that online learning is the future of learning, the findings of the study may become the fundamental of the development and improvement of quality online learning. Moreover, teacher's ability to anticipate motivational factors in his/her class is crucial to have an effective online course. This study, therefore, is meant to help provide the assistance by revealing the dimensions of student motivation when learning online.

METHOD

The present study used descriptive-correlational design to investigate the learning achievement variable (indicated by GPA and Perceptional Success) as dependent variable, and motivational factors as the independent variable. The conduct consists of two stages; (1) pilot study, which is to adapt the data collection instrument, and (2) data collection from the field to test out the hypotheses. The following will explain each stage of the study.

The first stage is the pilot study. The present study adapted the instrument of Intrinsic Motivation Inventory (IMI) which has been used by many for measurement in the field of education and psychology. In general, this instrument is used for cross-cultural study to find out how far culture influence, and also used for investigating the psychometric view from the tested instrument. The adaptation followed three phases, such as translating, validity and reliability test, and item analysis.

The translation phase was done in accordance with the pattern proposed by [11]. First, it should be translated to the mother tongue of the respondents, that is Indonesian. Second, back-translation was done to English. These phases were done by different doctors in the field of ELT who are expert in the language pair and have not read each other's translated instrument. Third, the translated files of both stages were evaluated to see whether or not they have represented the original inventory. This last stage was done by a different language expert. The result of this stage determined whether the cycle needs to be redone.

The second phase is validity and reliability test. This test was done through a try-out to 30 students and analyzed using SPSS 20. The last phase is choosing of the inventory items and perfect them. The Eigen-value of greater than 0,30 was used as the criteria of acceptance. Other data was collected from the students' GPA obtained in the odd semester of 2020-2021.

The total population for the study was students registered in the 2020-2021 year, the Faculty of Teacher Training and Education, Universitas Muhammadiyah Jember. The samples were 400 students from all study programs in the faculty, sampled using the stratified-proportional-random sampling because the population consists of students from different entry years.

Finally, to analyze the data this study employed several methods. The study first used the advanced statistics that is factor analysis as done to the instrument adaptation. The analysis was followed by the Cadrl Pearson correlation analysis to test the significance of alternative hypotheses H1 and H3. Finally, the regression analysis was done to test the H3 hypothesis.

RESULTS AND DISCUSSION

The data of students' motivation when learning online was analyzed using the factor analysis. This was done to investigate whether the number of factors contained in the inventory items abide its theory construct. The study particularly used the confirmatory factor analysis with the underlying rationale that three (3) factors of intrinsic motivation have been identified. The procedure, therefore, followed the stages as follows.

Initially, the sampling adequacy test was done using the KMO Bartletts test of Sphericity. This test resulted in the coefficient measure of sampling adequacy (MSA), as shown in Table 4.1.

Table 1 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.895
Bartlett's Test of Sphericity	Approx. Chi-Square	1992.810
	df	300
	Sig.	.000

Given that the MSA value of 0,895, which is greater than 0,500 coupled with the highly significant test result of Barlett's Test of Sphericity, the samples used in the study are considered appropriate for factor analysis. Next, the MSA was used to identify which items could take on the next analysis by observing the anti-image correlation. The items should be evaluated from its correlation value, which should be greater than 0,500. The result of analysis in the present study revealed that all items have satisfied all prescribed criteria, with the smallest correlation coefficient is at 0,690.

Following the stage is the extraction method using the Principal Component Analysis. The result of this step is depicted in Table 2. The table shows that the total variance explained from the 25 items is 69,141%. This percentage explains the magnitude of the learning motivation in the online learning. Meanwhile, the rest of it - 31% - is from other extraneous variables. Further, the table also shows that there are three components which possess Eigen values higher than 1, while the other 22 items show less than it. These three components further explain the variation of online learning motivation. See Table 3 for the component matrix.

Table 2 Total Variance Explained

Comp	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Var	Cum %	Total	% of Var	Cum %	Total	% of Var	Cum %
1	10,78	43,13	43,13	10,78	43,13	43,13	6,38	25,53	25,53
2	3,99	15,94	59,07	3,99	15,94	59,07	6,34	25,37	50,91
3	2,52	10,07	69,14	2,52	10,07	69,14	4,56	18,23	69,14
4	,97	3,89	73,03						
5	,85	3,38	76,41						
6	,73	2,92	79,32						
7	,61	2,43	81,75						
8	,53	2,13	83,88						
9	,47	1,90	85,78						
10	,41	1,63	87,41						
11	,39	1,54	88,95						
12	,30	1,20	90,15						
13	,29	1,18	91,32						
14	,28	1,13	92,46						
15	,27	1,07	93,52						
16	,25	,99	94,51						
17	,24	,97	95,48						
18	,21	,83	96,31						
19	,19	,77	97,07						
20	,17	,68	97,75						
21	,16	,65	98,40						
22	,13	,51	98,91						
23	,11	,43	99,34						
24	,09	,34	99,68						
25	,08	,32	100,00						

Table 3 Component Matrix[a]

Item	Component		
	1	2	3
K11	,779	,111	,420
K12	,816	,101	,296
K13	,806	,187	,397
K14	,783	,145	,432
K15	,509	,182	,507
K16	,813	,071	,361
K17	,837	,220	,310
K18	,794	,165	,379
K21	,782	,131	-,199
K22	,693	,212	-,215
K23	,773	,105	-,318
K24	,665	,010	-,299
K25	,519	,224	-,519
K26	,806	,094	-,267
K27	,737	,200	-,430
K28	,690	,023	-,464
K29	,701	,167	-,385
K31	-,166	,836	-,153
K32	-,413	,639	,068
K33	-,256	,778	,058
K34	-,306	,685	,056
K35	-,729	,361	,193
K36	-,564	,560	,086
K37	-,046	,784	-,191
K38	-,475	,595	-,034

Extraction Method: Principal Component Analysis.
a. 3 components extracted.

Continued...

The analysis result of the last row of Table 3 indicate that the three components can be extracted from the 25 items of online learning motivation. With the identified three factors above, it is further important to find the items containing each factor. To satisfy this need, the rotated factors was done using the varimax method, revealing the result in Table 4.

Table 4 Rotated Component Matrix[a]

	Component		
	1	2	3
K11	,847	,248	-,128
K12	,783	,360	-,145
K13	,866	,298	-,062
K14	,866	,249	-,096
K15	,740	,018	,017
K16	,820	,306	-,174
K17	,833	,387	-,039
K18	,840	,298	-,079
K21	,419	,695	-,098
K22	,365	,662	,006
K23	,324	,768	-,118
K24	,243	,664	-,178
K25	,036	,763	,073
K26	,380	,753	-,139
K27	,241	,842	-,015
K28	,147	,801	-,170
K29	,242	,779	-,037
K31	-,037	,157	,850
K32	-,092	-,205	,730
K33	,038	-,065	,818
K34	-,018	-,115	,743
K35	-,280	-,561	,553
K36	-,199	-,335	,698
K37	,006	,255	,767
K38	-,215	-,183	,708

Continued…

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The factors loaded in each item can be read in Table 4. K11 until K18 stands for Questionnaire item 11 to item 18, loading the factor 1, shown with the coefficient by 0,847 for the first item, and 0,840 for the eighth one. Moreover, factor 2 is loaded in K21 until K29, and K31 until K38 contain factor 3.

Based on the Intrinsic Motivation Theory, component or factor 1 is the sub motivation of interest, factor 2 is usefulness, and factor 3 is perceived choice. In conclusion, the factor analysis shows that the factor conforms the underlying theory used in the study, or in other words, the result of factor analysis supports the first hypothesis that online learning motivation consists of three factors.

Student's Online Learning Motivation

Online learning motivation as referred to in the study consists of four sections. The three of all sections include sub-scales of interest, usefulness, and perceive choice. The remaining section is the accumulation of the three sub-scales, or all in all, the online learning motivation. The descriptive analysis is presented in the following manner; it starts with the analysis of the general scale and followed by the sub-scales.

Online Learning Motivation Scale based on the Total Score

The accumulated data of students' online learning motivation can be seen in Table 5. The table revealed that the category with the highest frequency reflecting the online learning motivation is "fair" (38,9%), while the low categories (low and very low) will amount up to 35,8% if summed, whereas the high categories (high and very high) have the least frequency when summed, which is 25,3%.

Table 5 Frequency of Total Motivation Scale

Categories	Frequency	Percentage	Cumulative Percentage
Very low	4	4,2	4,2
Low	30	31,6	35,8
Fair	37	38,9	74,7
High	23	24,2	98,9
Very High	1	1,1	100
Total	95	100	

Interest Sub-Scale

The interest sub-scale reveals the data of how far students are interested or enjoy learning online. Some of the items are "While I was doing online learning," and "I was thinking about how much I enjoyed it. Online learning was fun to do." There are eight items in total, and this sub-scale has been analyzed and revealed the result as in Table 6.

Table 6 Sub Interest

Categories	Frequency	Percentage	Cumulative Percentage
Very low	21	22	22,1
Low	15	15,8	37,9
Fair	20	21,1	58,9
High	29	30,5	89,5
Very High	10	10,5	100
Total	95	100	

Unlike the total motivation data, the sub-scale of interest as shown in Table 6 shows a more balanced trend between the low, fair, and high. Therefore, the data can be read as follows; 37,9% of the respondents do not quite enjoy online learning. On the contrary, the students who are highly encouraged to learn achieve 41% (the data involved the percentage from high and very high categories).

Usefulness Sub-Scale

In this sub-scale, the researcher sought the data of how useful is online learning for the respondents. This sub-scale has 9 items, like "I believe that doing online learning is useful for improved concentration" and "Online learning was fun to do." The data of usefulness sub-scale can be seen in Table 7.

Table 7 Usefulness Sub-scale

Categories	Frequency	Percent	Cumulative Percent
Very low	5	5,3	5,3
Low	13	13,7	18,9
Fair	36	37,9	56,8
High	24	25,3	82,1
Very high	17	17,8	100,0
Total	95	100,0	

Table 7 reveals that the high and very high categories reach the percentage of 24% and 17%, respectively, when summed will total the most percentage of the sub-scale. This percentage increases because many of the students think that the online learning is fairly useful for them (36%). On the other hand, the low and very low category have reached the least percentage, 13,7% and 5,3%, respectively, or 18,9% when summed.

Perceived Choice Sub-Scale

The third sub-scale is perceived choice factor. The result of this sub-scale is presented in Table 8. This sub-scale is loaded in eight items which question how far the respondents involve themselves in online learning based on their own choice or preferences. Some examples of the items are "I believe I had some choice about doing online learning" and "I did this activity because I wanted to".

Table 8 Perceived Choice Sub-scale

Categories	Frequency	Percent	Cumulative Percent
Very poor	11	11,6	11,6
Very low	8	8,4	20,0
Low	15	15,8	35,8
Fair	51	53,7	89,5
High	9	9,5	98,9
Very high	1	1,1	100,0
Total	95	100,0	

As seen in Table 8, the category with the most percentage is "Fair" (53,7%), followed by low (15,8%) and very low as well as very poor which could total up to 20%. It means that if the low categories are summed, they will total up to 35,8%, or 36% of the total respondents get themselves involved in online learning not

because of their own will. However, it is worth to note that the study took place when students have no other alternatives than to take the online courses. Therefore, this finding could be biased.

Contribution of Online Learning Motivation towards Students' Performance

As aforementioned in this report, the contribution of motivation on students' performance is seen from the total score of online learning motivation scale and the result of each of the three sub-scales, namely interest, usefulness, and perceived choice. The scale and sub-scales play as the independent variables, while the students' performance, as seen from their average score is the dependent variable. The final result of the correlation analysis using the Product-Moment method is presented briefly in Table 9.

Table 9 Correlation Coefficient of Online Learning Motivation and Students' Performance

Sub-Scale	Average Score Obtained in an Online Course
Sub 1 Interest/Enjoyment	0.412**
Sub 2 Value/Usefulness	0,120
Sub 3 Perceived Choice	-0,084
Total Motivation Scale	0,073

**. Correlation is significant at the 0.01 level (2-tailed).

Table 9 describes that the interest sub-scale is the only variable which has significant correlation with the average score, with the score of 0,412. Meanwhile, the second and third sub-scale and the motivation scale do not show significant correlation.

Given the result of correlation analysis, this study interprets that online learning motivation has contributed to the students' performance through the interest/enjoyment sub-scale. From the correlation coefficient of 0,412 it is known that the determinant coefficient of the sub-scale particular contribution is 0,169 or 17%. In other words, 17% of the obtained score of the course can be explained from the online learning motivation, particularly from the interest sub-scale.

CONCLUSION

The three intrinsic motivation factors, namely interest/enjoyment, values/usefulness, and perceived choice, which can be extracted from the general learning motivation can be identified from online learning motivation, as investigated in this study. The findings have generalized the validity of intrinsic motivation, that not only for the conventional or face-to-face learning but also online. Using the instrument which has been evaluated using the factorial validity, the study obtained that online learning motivation of the students is within the fair category. This motivation has in fact contributed significantly towards the students' learning achievement or performance particularly from the interest/enjoyment factor, but not from the other two factors, namely value/usefulness dan perceived choice.

The findings imply that the instrument with three factors as used in this study has a strong factorial validity for the online learning context. Future studies are therefore encouraged to investigate the variable using the 4- or 5-factors instrument. The instrument used in this study could explain the contribution of online learning motivation towards students' performance but only from the interest factor. It is worth a study to know whether the use of 4- or 5-factors instrument can inform deeper understanding of the contribution of online learning motivation towards students' performance.

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