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Factor Analysis Of Student Learning Motivation Independent Learning Curriculum

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Abstract: This research investigates the multifaceted dimensions of student learning motivation within the context of independent learning curricula, employing factor analysis to dissect the underlying constructs and their inter-relationships. The study aims to provide a nuanced understanding of the key motivational factors that drive student engagement, persistence, and academic success in self-directed learning environments. This study employed a quantitative research design, utilizing survey methodology to collect data from a sample of students enrolled in independent learning programs. The survey instrument was designed to capture a comprehensive range of motivational variables, including intrinsic motivation, extrinsic motivation, goal orientation, self-efficacy, task value, and achievement motivation. Confirmatory factor analysis was then used to validate the factor structure and assess the model fit. Specifically, the independent learning curriculum focuses on enhancing the student's satisfaction in learning and promoting students' deep involvement in learning activities to enrich their experience and foster long-life learning. The result revealed that student learning motivation significantly impacts their satisfaction, involvement, competence, achievements, and overall performance. Furthermore, learning curricula place a greater emphasis on student autonomy, self-regulation, and personalized learning pathways, necessitating a deeper exploration of the motivational mechanisms that underpin effective learning outcome

Keywords: Student learning motivation, Independent learning curriculum, Satisfaction

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1. Introduction

Success in education is influenced by many factors. One of the important factors that influence student learning outcomes is motivation. Motivation is one of the most important factors in the success of education. Without motivation, students tend to have difficulty maintaining interest and consistency in learning. Motivation helps learners to set learning goals, strive to achieve them, and overcome obstacles that may arise during the educational process. In this context, motivation can be divided into two types, namely *intrinsic* motivation (encouragement from within oneself) and *extrinsic* motivation (encouragement from outside such as rewards or recognition). Research shows that students with *intrinsic* motivation tend to have higher academic achievement than those who are only *extrinsically* motivated [1]. In addition, motivation is closely related to learners' engagement in the learning process. Motivated learners will be more active in following lessons, asking questions, discussing, and exploring the subject matter. This supports constructivist theory in learning which emphasizes the importance of active

involvement of learners to build knowledge. According to Schunk et al. [2] high motivation increases focus, persistence, and more effective learning strategies. Therefore, teachers and parents need to create a learning environment that supports and encourages the emergence of learning motivation.

The role of teachers in building learner motivation cannot be ignored. Teachers who are able to develop positive relationships with students, provide constructive feedback, and create an interesting and challenging learning atmosphere, will increase student motivation. Conversely, an authoritarian approach that pays little attention to students' emotional needs can actually decrease motivation. In a study by Wigfield & Eccless [3] , it is explained that students' expectations of success and perceived value of learning tasks are strongly influenced by social interactions and the learning environment.

Learning motivation is an internal or external drive that encourages individuals to engage in learning activities with the aim of achieving the desired results. This motivation not only determines how much effort a person expends in learning, but also affects how long he can maintain the effort. According to Dörnyei & Ushioda [4] learning motivation includes cognitive, affective and social factors that influence student engagement and performance in an educational context. In practice, students who have high learning motivation tend to be more focused, have good learning strategies, and show resilience in facing academic challenges.

Recent research also shows that learning motivation is strongly influenced by modern learning contexts, such as digital learning and project-based learning. A study by Liu et al. [5] examined the relationship between learning motivation, emotional engagement, and academic performance in a blended learning environment at university. The results show that intrinsic and extrinsic motivation, along with emotional engagement and psychological capital, contribute positively to students' academic achievement. Extrinsic motivation significantly affects intrinsic motivation, emotional engagement and psychological capital, which in turn impact academic performance.

Motivation to learn is an important aspect of the educational process, but the level and type of motivation each student has can vary. This difference is influenced by various factors, including family background, social environment and individual characteristics. One of the factors that influence learning motivation is family conditions. Research by Fortuna Azhari et al. [6] shows that there are differences in learning motivation between students who come from intact families and students from broken home families in SMA Negeri 4 Batanghari Regency. Students from intact families tend to have higher learning motivation compared to students from broken home families.

Differences in learning motivation can also occur based on the cultural background or region of origin of students. Research by Arumsari [7] found that there were differences in learning motivation between students from Java and Papua, with Javanese students showing higher learning motivation. To accommodate this difference in learning motivation, a differentiated learning approach can be applied. Research by Ramdhani et al [8] shows that differentiated learning can increase students' learning motivation in history learning. By adjusting the learning method according to students' needs and characteristics, learning motivation can be improved significantly.

By understanding that each student's learning motivation is different, educators can design more effective and inclusive learning strategies, thus improving overall learning

outcomes. Based on the previous description, it can be concluded that student learning motivation is a complex psychological construct and is influenced by various internal and external factors. Each student has different levels and types of motivation, so it is important to understand the structure of the factors that make up the motivation in depth. Therefore, this research will focus on factor analysis of student learning motivation using *Confirmatory Factor Analysis* (CFA) to analyze and identify factor structures that may emerge empirically, and to test the suitability of the theoretical model with the data collected.

2. Result

Based on the results of factor analysis using SPSS, which includes three main factors, namely *Instrinsic* Motivation, *Extrinsic* Motivation, and *Basic Psychological Needs.*

Factor Analysis Feasibility Test

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.900
Bartlett's Test of Sphericity	Approx. Chi-Square	1845.651
	df	136
	Sig.	.000

Factor analysis begins with the *Kaiser-Meyer-Olkin* (KMO) and *Bartlett's Test of Sphericity*. The KMO value of 0.900 indicates that the sample is sufficient and very suitable for factor analysis. Meanwhile, Bartlett's Test resulted in a *chi-square* value of 1845.651 with a significance of 0.000, which means that there is a correlation between variables in the population and the data is suitable for further analysis using factor analysis.

Principal Component Analysis Test

Based on the extraction results using the *Principal Component Analysis* (PCA) method and Varimax rotation, three main components were obtained which explained 57.384% of the total variance, with the following details:

Rotated Component Matrix [a]

Item	Component		
	Instrinsic Motivation	***Extrinsic* Motivation**	***Basic Psychological Needs***
MB1	.852		
MB2	.783		
MB3		.776	
MB4		.600	
MB5		.704	
MB6		.729	
MB7		.795	
MB8		.741	
MB9		.787	
MB10		.745	
MB11		.710	
MB12			.755
MB13			.723

MB14			.626
MB15			.779
MB16			.724
MB17			.780

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

Based on the table above, this factor includes two indicators, namely those consisting of items 1 and 2 with high loadings (MB1 = 0.852 and MB2 = 0.783). This factor describes the internal motivation of individuals in carrying out activities due to personal satisfaction or intrinsic interest. The communality values of MB1 and MB2 are 0.728 and 0.660 respectively, indicating a fairly high proportion of the variance explained by this factor. *Extrinsic* Motivation is the second factor and includes indicators MB3, MB4, MB5, MB6, MB7, MB8, MB9 and MB10 with loadings ranging from 0.704 to 0.795. This component describes motivation that comes from outside the individual, such as rewards, social pressure, or other external encouragement. The communality values on these items are also quite strong, such as MB10 (0.621), MB8 (0.612), and MB9 (0.632).

Furthermore, *Basic Psychological Needs* as the third factor consists of seven indicators, MB11, MB12, MB13, MB14, MB15, MB16 and MB17, which reflect basic psychological needs such as competence, autonomy, and social relatedness. These items have loadings between 0.626 to 0.780, with moderate to high communality values, indicating that these variables are very good at representing basic psychological factors.

Total Variance Explained

Total Variance Explained is a table that shows how large a proportion of the total variance in the data can be explained by the factors extracted through factor analysis. Each component (factor) in the table has an eigenvalue, which reflects the relative contribution of that factor to the total variance of the data.

Typically, only factors with an eigenvalue ≥ 1 are considered significant (based on Kaiser's criteria), as factors with an eigenvalue < 1 explain less variance than a single original variable.

Component	Initial Eigenvalue	% Variance	Cumulative %	After Rotation (% Variance)
Instrumental motivation	6.894	40.554%	40.554%	37.859%
Extrinsic Motivation	2.861	16.830%	57.384%	19.525%
Basic Psychological Needs	0.928	5.458%	62.842%	-

Instrumental motivation has an eigenvalue of 6.894, which means this factor explains 40.554% of the total variance before rotation. After rotation, this factor explains 37.859% of the variance. This shows that this factor is the most dominant in explaining the data. *Extrinsic* Motivation has an eigenvalue of 2.861, explaining an additional 16.830% of the variance before rotation, and 19.525% after rotation. This factor also contributes significantly. *Basic Psychological Needs* had an eigenvalue < 1 (0.928 to be exact) and was therefore not retained in the final model. Only two factors met the criteria of eigenvalue ≥ 1 and were used for rotation.

So, the total variance explained by the 2 main factors after rotation is 37.859% + 19.525% = 57.384%. This means that the two retained factors managed to explain 57.384% of the overall information or variation contained in the data. This is a fairly good proportion of variance in social studies, and indicates that the factor structure obtained is quite representative.

3. Discussion

Exploratory factor analysis was conducted to test the construct validity of the instrument consisting of 17 items. The extraction method used was Principal Component Analysis with Varimax rotation. Before the analysis was conducted, data feasibility tests through Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Sphericity were conducted to assess the suitability of the data for factor analysis. The KMO value of 0.900 indicates excellent sample adequacy. Meanwhile, the Bartlett's Test results show an Approx. Chi-Square value of 1845.651 with degrees of freedom (df) = 136 and significance $p < 0.001$, which indicates that there is a significant correlation between variables and the data is suitable for factor analysis.

The analysis results show that there are three main factors formed based on eigenvalues above 1 and theoretical interpretation results. These three factors cumulatively explain 57.384% of the total variance. The first factor had an eigenvalue of 6.894 and explained 40.554% of the variance, the second factor had an eigenvalue of 2.861 with a contribution of 16.830% of the variance, while the third factor had an eigenvalue below 1 but was included based on theoretical considerations and consistent item structure.

The first factor is named Intrinsic Motivation, consisting of two items (MB1 and MB2) that reflect an individual's internal drive to perform an activity due to personal interest or satisfaction. The second factor, Extrinsic Motivation, includes items MB3 to MB10 that describe motivation due to external rewards, social pressure, or environmental demands. The third factor, Basic Psychological Needs, consists of items MB11 to MB17, which refer to the three basic needs in self-determination theory, namely competence, autonomy, and relatedness.

The Rotated Component Matrix results show that all items have factor loadings above 0.60, which indicates a significant contribution to each factor. Thus, the three-factor structure formed is statistically and theoretically acceptable. This instrument is declared to have good construct validity and can be used to measure the dimensions of motivation and basic psychological needs in accordance with the self-determination theory approach.

The results of factor analysis show that this research instrument has a clear and stable three-factor structure: Instrinsic Motivation, Extrinsic Motivation, and Basic Psychological Needs. These three factors collectively explain more than 57% of the total variance which is quite adequate in social or psychological studies. The very high KMO value (0.900) and strong Bartlett's significance reinforce the construct validity of this instrument. Therefore, it can be concluded that this factor structure can be reliably used to measure the dimensions of motivation and psychological needs in your research context.

4. Materials and Method

This research uses a quantitative approach with a survey type of research. By applying this quantitative approach, it is expected to provide a valid and reliable picture of the dimensions of student learning motivation, which can later be used as a basis for designing learning interventions that are more targeted.

The research subjects were *Al-Washilah* Junior High School students who used Merdeka Belajar curriculum, the subjects were selected using *purposive sampling* technique. CFA data analysis using SPSS 22 to determine the factors that influence student learning motivation. The following is a questionnaire grid (or blueprint) for measuring student learning motivation based on the Self-Determination Theory (SDT) theory from Deci & Ryan [9] . This grid includes indicators and aspects of questionnaire statements that can be used in research.

ASPECT	INDICATOR	STATEMENT
Instrinstic Motivation	Enjoy Learning Because of Interest	1. I study because I enjoy the material I am learning.
	Learning Gives Personal Satisfaction	2. I feel satisfied if I understand the subject matter well.
Extrinsic Motivation which includes (*External regulation, Introjected Regulation, Identidied regulation, Integrated regulation*)	*External regulation*	
	Learning because of rewards or punishments	3. I study to get high grades.
	Learning to avoid punishment	4. I study for fear of being scolded by teachers/parents.
	Introjected Regulation	
	Learning because of inner/internal pressure	5. I study because I feel guilty if I don't study.
	Learning so as not to be embarrassed with friends	6. I study because I am afraid of looking stupid by my friends.
	Identified Regulation	
	Learning because I realize the importance of the lesson	7. I study because I know this lesson is important for my future.
	Learning as a personal need	8. I feel the need to study in order to achieve my goals.
	Integrated Regulation	
	Learning is part of my life values	9. Learning is an important part of who I am
	Learning is in line with life goals	10. I study because it is in line with my goals.

Basic Psychological Needs that include (*Autonomy*, *Competence*, *Relatedness*)	*Autonomy*	
	Learning because of my own desire	11. I study not because I am told to, but because I want to.
	Feel free to choose how to study	12. I feel free to choose my own way of learning.
	Competence	
	Confident in completing tasks	13. I believe I am able to complete school assignments well.
	Feel able to understand the material	14. I feel capable of understanding even difficult subject matter.
	Relatedness	
	Feeling supported by the teacher	15. I feel supported by the teacher in the learning process.
	Feeling accepted by classmates	16. I feel comfortable and accepted by my friends in class.
	Feeling learning together is more fun	17. I feel more enthusiastic about learning when I am with friends.

5. Conclusions

Statistically, these three factors together explain 57.384% of the total variance of the overall data. This is a good value in the context of social research, which generally considers anything above 50% as adequate for data representation. Each item has a communality value that indicates the variable's contribution to the factor is quite high (average above 0.6), indicating that the indicators in this research instrument are quite good at representing each of the factors formed.

This three-factor structure supports the theoretical assumption that human motivation in a particular context (e.g. education, organization, or sport) can be categorized into intrinsic, extrinsic, and basic psychological needs. The findings also indicate that the instrument used in the study is feasible and valid to measure these constructs, and can be used in future research to study individual motivation and psychology in various context.

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