WHY DO I STUDY? THE MEDIATING EFFECT OF MOTIVATION AND SELF-REGULATION ON STUDENT PERFORMANCE

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Abstract. The present study is designed to improve understanding of personal and situational effects on academic performance. This study examines relationship between flexible assessment system and academic performance mediated by self-regulation and academic motivation. This study also investigates moderated gender as a variable on the relationship models. A sample of 326 students of economics and business program were participated in the current study. The results indicate that academic motivational construct is a strong predictor of students' self-regulation in learning and academic performance. Self-regulation mediates relationship between students' academic motivation and students' academic performance. Academic motivation and self-regulation also mediate the relationship between flexible assessment system and self regulation. The results also indicate that flexible assessment system does not have a direct relation with performance. These results are discussed with regard to the relevance of flexible assessment system, academic motivation, and self-regulation in increasing academic performance.

Keywords: flexible assessment system, academic motivation, self-regulation, student performance, self-efficacy, cognitive motivation theories.

JEL Classification: M12, I23, M14, M53.

1. Introduction

Motivation is seen as a key factor affecting learning outcomes. High learning achievement is often associated with high motivation and learning environment and affects high motivation (Chen 2001). Recently, research on students' academic motivation seems to be the core of research in the context of learning. Noe (1986) stated that students' academic motivation indicates the need for students to study the substance of learning programs. Academic motivation is indicators of cognitive, emotional, and behavior of students, as well as a devotion of education (Tucker *et al.* 2002). However, it is actually hard to understand what motivates the students to learn.

Academic motivation is a key determinant of selection of students to be bound in the learning process. Academic motivation is presented in the learning process, and bonded actively in learning activities. Previous researchers suggest that academic motivation is a robust predictor of learning outcomes such as academic performance and is affected by individual and situational characteristics (Noe 1986; Tannenbaum, Yukl 1992). Previous study also indicates that there is strong positive correlation between academic motivation and academic performance or learning outcomes (Noe, Schmitt 1986; Colquitt *et al.* 2000). The research results of Klein *et al.* (2006) stated that academic motivation is also associated with satisfaction in the learning and assessment methods used. Previous research conducted in the context of learning stated that motivation plays an important role in learning (Shiu, Lin 2012). According to Tucker *et al.* (2002), some researchers claim that only motivation that directly affects academic performance, meanwhile, other factors will affect the academic performance only through its influence on motivation. In other words, academic motivation is an important factor for student achievement and become mediating of various independent variables that affect academic performance.

Students with a positive attitude and have high academic motivation will demonstrate learning independent, will have high achievement, and they will have high academic performance (Green *et al.* 2006). Academic motivation and self-regulation are interconnected and can predict whether students will perform well (Paulsen, Gentry 1995; Zimmerman 2002). Academic motivation is an important factor in self-regulation (Hong, O'Neil 2001). Therefore, academic motivation and self-regulated learning as two interrelated constructs and affects academic performance.

Besides academic motivation, self-regulation or self-regulated learning can indeed direct the academic learning process (Zimmerman 1986, 1990). Self-regulation is a condition in which individuals can use social processes to regulate their behavior and ability to form a learning environment through feedback (Hong, O'Neil 2001). A strong relationship between academic motivation and self-regulation have been investigated in various studies (Bandura 1993; Zimmerman 1990; Zimmerman *et al.* 1992; Pintrich, De Groot 1990; Fadlelmula *et al.* 2015; Lichtinger, Kaplan 2015). Students with high self-regulation are also likely to use his skills and become self-efficacious, and be able to increase their effort in a learning situation and be better than individuals with low self-regulation (Hong, O'Neil 2001). In this study, the self-regulation construct is a compounding of self-efficacy and effort. In addition, self-regulation is affected by the assessment system and may mediate the relationship between academic motivation and academic performance.

Self-efficacy can affect an individual's belief in the ability that is shown in his academic performance (Bandura 1993; Mulkey, O'Neil 1999). A previous study presents a significant correlation between self-efficacy and students' academic performance (Barrows *et al.* 2013). Individuals who do not perceive that he is competent will lose motivation to complete their tasks that are heavy and just focus on the negative results

(Barrows *et al.* 2013). Previous research suggests a strong correlation between academic motivation, self-efficacy, and self-regulation (Hong, O'Neil 2001). Both self-efficacy and academic motivation are important factors for self-regulated learning and have an influence on self-regulated learning.

According to Pacharn *et al.* (2013), flexible assessment system allows students to learn self-regulated learning skills so that students can choose the tasks and participate in it. As well as curricula and teaching methods, assessment system is a part of the learning context. Assessment system is more affecting student learning than learning styles (Gibbs, Simpson 2004). Assessment system can increase students' learning motivation (Pacharn *et al.* 2013). Cook (2001) states that the flexible assessment system could relieve stress of students in the examination.

This study is built to find a relationship model between flexible assessment system, self-regulation, academic motivation and student performance. In general, this study also examines the influence of personal factors and situational or environmental toward academic motivation that energizes and directs students' behavior or to achieve better performance. This study tests academic motivation and self-regulation as mediating variables on positive relationship between flexible assessment system and academic performance. This is due to two things are interrelated and equally affect student performance. This study uses a self-report questionnaire to assess students' academic motivation, flexible assessment system, self-regulation, and academic performance.

2. Literature review and hypothesis development

2.1. Academic motivation and academic performance

In higher education, research on the learning process, student achievement, and students' academic motivation play important role in learning and academic performance. Motivation is a popular issue for researchers and academicians. Motivation indicates the conditions in which individuals intensified informal, direct, and sustain behavior (Green *et al.* 2006). In the context of student learning, academic motivation is used to increase the effort and enthusiasm in the attachment, performance, and persistence in learning. Motivation is the desire and control to achieve a particular action or behavior (Cortright *et al.* 2013). Motivation is a psychological process resulting from the interaction between individual factors and environmental factors.

Academic motivation is also an important and significant factor for academic learning. Academic motivation regarding doing tasks, effort and persistence in academic tasks and understanding all subjects that is elected. Motivation has positive impact on learning by supporting, encouraging, and providing direction on learning activities (Mubeen *et al.* 2013). Although motivation is a confusing topic in organizational science, but organizational researchers present motivation as a basis for the development of effective theory (Steers *et al.* 2004). The social cognitive models stated that students

are motivated in different ways, either by intrinsic factors (cognitive) and extrinsic factors (social and cultural) (Dweck, Leggett 1988). Failure in academic performance is considered as a result of low academic motivation.

Academic motivation can be understood by using motivational theories such as self-determination theory, attribution theory, academic self-concept, need for achievement, expectancy theory, and self-efficacy theory. Self-determination theory emphasizes the electoral behavior intentionally, while the attribution theory emphasizes the explanation of the causes of individual behavior internally and externally (Hartman *et al.* 2013). Meanwhile, academic self-concept is a general view of individuals' academic competence that can drive the success academically (Bong, Clark 1999). McClelland states that need for achievement is a desire for achievement that emphasize on what directs the hope of success and fear of failure (Robbins, Judge 2011). Expectancy theory and self-efficacy theory are motivation theories that are most often used which emphasizes individual expectations for the competence or confidence in the ability to perform their duties and bound to certain desires, especially in learning activities. Furthermore, self-concordance theory identifies two reasons for achieving their goals, which is the reason that expressed a desire long-term (Sheldon, Elliot 1999) and the grounds were prompted by circumstances or by others (Gore, Rogers 2010).

Motivation is referred to as the cognitive processes that occur in the personality then motivation is expressed into the social environment. Motivation can be characterized as a model of thought that drive the behavior of individuals (Achakul, Yolles 2013). The internal process can be influenced by personal and environmental factors associated with attachment to the activity and administration of reward and punishment on the student attachment. In general, the goal of motivational research was to examine the influence of personal and environmental factors to the internal processes as to provide energy and can drive behavior (Chen 2001). In the field of education, academic motivation research is tied to how personal and environmental factors in the learning process can affect student learning. Academic motivation is an important element in the learning process, although at the same time that element is not enough for students to achieve performance or better performance (Barrows *et al.* 2013).

2.2. Self-regulation and academic performance

Self-regulation is important because educational objectives are to achieve expertise in lifelong learning. Self-regulated learning is an inherent aspect of cognitive learning, which includes knowledge, belief, and the skills learned (Kadhiravan 2012). Social Cognitive Theory provides a theoretical basis for the development of independent learning model within the individual, where contextual and behavioral factors interact to give the learners an opportunity to control the learning outcome. In this study, contextual factor is flexible assessment system, whereas behavioral factor is academic motivation.

Self-regulatory trait is one of the personality characteristics that influence motivation. However, self-regulation also presents the personal beliefs or individual's confidence of his ability in a particular task (Yusuf 2011). Zimmerman and Martinez-Pons (1986) proved the closeness of the relationship between nature and perception of students' independence on their academic self-efficacy. In other words, self-regulation is positively related to students' academic self-efficacy and students' performance. Students with high self-efficacy are motivated to achieve high academic performance. According to Pintrich and De Groot (1990), students with high self-regulation are more motivated to use strategies such as planning, organizing, and self-monitoring strategies than students with low self-regulation. Pintrich and De Groot (1990) also suggests that there is a correlation between academic motivation and self-regulation in learning, as well as positive influence of academic motivation and self-regulation to students' academic performance.

Students who have high self-regulation will have great ideas about how and why certain learning strategies used. Self-regulation combines motivational process such as self set goals and performance, maintain a positive belief about the ability of individuals, assessing learning and know the results, as well as experiencing a positive feeling as proud or satisfied with the efforts that have been made (Schunk 2005). Hong and O'Neils' (2001) research results showed that one-dimensional self-regulation is the motivation. The dimensions of motivation in this study include self-efficacy and effort. Positive relationship between self-efficacy and self-regulation in the academic field has been extensively tested in the previous study (Zimmerman *et al.* 1992; Malpass *et al.* 1999).

Self-regulation is seen as a condition or trait (Hong, O'Neil 2001). Conditions show a relatively volatile individual who showed variability in individuals who are subject to change. Meanwhile, the nature of the individual condition showed stable or fixed from time to time. According to Zimmerman (1990), self-regulated learners presented a high sense of efficacy in their ability for influencing knowledge and expertise in goals setting and its commitment to meet the challenges. Non self-regulated student was not involved in learning (Yusuf 2011). Individuals who do not have self-regulation will have low academic performance (Zimmerman 1986).

The impact of students' perceived self-efficacy on self-regulation has not been tested directly (Zimmerman *et al.* 1992). Research results of Zimmerman *et al.* (1992) suggested that students' self-belief of efficacy against the strategically regulate learning is an important factor in academic motivation. Individuals with low self-efficacy will have a negative mindset towards task demands and that task is seen as a threat and not as a challenge (Yusuf 2011). They will also set goals lower. In addition, students who perceive themselves were able to organize its activities in the long term is students who believe on their ability to understand the lessons and were able to achieve better performance (Zimmerman *et al.* 1992).

Without academic motivation, self-regulation is difficult to achieve (Zumbrunn *et al.* 2011). Individuals with high self-regulation will be able to achieve high academic performance (Zimmerman 2008; Schunk, Zimmerman 2007; Wolters, Hussain 2015). Students that are motivated to learn will use their time and energy to learn and implement self-regulation. When students successfully apply self-regulation, they will be motivated to accomplish the learning tasks (Zimmerman 2000). In general, self-regulation and academic motivation supports each other in explaining student learning and student performance in the classroom.

Self-regulation can encourage students' intrinsic motivation for enhancing student learning (Cheng 2011). Zimmerman and Martinez-Pons (1986) also believe that the self-regulated ability was the best predictor of student learning performance. Boekaerts (1995), Corno (1986), as well as Pintrich and De Groot (1990) state that students' academic motivation is an important component of self-regulation. In other words, academic motivation affects students' self-regulation. However, self-regulation can improve or enhance the learning motivation. Chengs' research results (2011) showed that self-regulation can enhance student learning. His research results showed that learning performance related to academic motivation and self-regulation.

2.3. Flexible assessment system and academic performance

Flexible assessment system allows students to learn independently and indicates their involvement (Pacharn *et al.* 2013). The assessment can affect the motivation through its influence on the orientation of students to learn. The assessment system is an attempt to get information about the performance of the students and become the primary teachers' responsibility. Several previous studies have shown their strength of assessment system that can support or encourage learning and student motivation (Harlen, Crick 2003; Natriello 1987).

Flexible assessment system can increase students' involvement in the learning activities and improve the students' independence in learning. Involvement in learning will encourage individuals to participate actively so that it can drive motivation and learning behavior (Zimmerman, Martinez-Pons 1986). Flexible assessment system will encourage students to assess their strengths and weaknesses, designing studies that can increase motivation, and evaluate learning approaches in the past to choose a more appropriate learning strategy. Ames (1992) states that academicians can use a mastery goal orientation approach for their students, including the engagement in learning and feel the establishment that may affect the achievement or academic performance.

Pacharn *et al.* (2013) stated that the flexible assessment system can be more effective in increasing student motivation and affect academic performance. Self-determination theory stated that students need a sense of competence, have autonomy or independence, and can communicate with others (Singh, P., Singh, N. 2013). According to Alkharusi

et al. (2014), there is relationship between motivation and students' perceptions of assessment. This is because the perception of the assessment system is likely to affect students' perception of his ability to complete a task.

2.4. Relationship between flexible assessment system, academic motivation, self-regulation, and academic performance

Although a lot of research on education is effective teaching methods, but research on the relationship of assessment methods, academic motivation, self-regulated learning, and academic performance or student achievement remains to be examined carefully. Assessment methods is a method of teaching practice that is used to assess students in the classroom based on variety of matters specified as the basis for the assessment by teachers, students, friends, and so on (Smimou, Dahl 2011). The assessment method determines how students perform in the classroom based on multiple measurements as a determinant of educational system. Flexible assessment system will encourage student achievement through learning motivation and setting learning strategy. The assessment system will encourage the students put learning objectives, moving the students reach the learning objectives, and encourage students to choose the best strategy to achieve these objectives.

Research regarding self-regulation and learning motivation indicates relationship between these two constructs (Schunk 2005). Students who have high self-regulation tend to have higher academic motivation compared to other students who do not have self-regulation (Pintrich 2003). Academic motivation shows students' interest and effort achieve their goals and contribute to the academic success (Dweck, Leggett 1988). Academic motivation is an important factor in student learning. Self-regulation is the process whereby individuals set goals, monitor, manage, and control motivation, cognition, and behavior (Rakes, Dunn 2010). Associated with motivation, self-regulated learners have orientation on purpose and have high self-efficacy in learning.

Students' competence and expertise did not explain fully the students' academic achievement (Schunk, Zimmerman 2007). There are several other factors that play an important role in students' academic performance, namely academic motivation (Areepattamannil *et al.* 2011). Academic motivation was positively related to learning strategies and academic performance (Rakes, Dunn 2010). This presents that academic motivation affects academic performance through self-regulation. In other words, self-regulation mediates the effect of academic motivation on academic performance. Results of previous studies state that academic motivation and self-regulation are directly related to academic performance (Pintrich, De Groot 1990; Zimmerman, Martinez-Pons 1990; Van Den Hurk 2006; Fadlelmula *et al.* 2015). Based on social learning theory, there is significant relationship between academic motivation, self-regulation, and academic performance.

Previous research also states that self-regulation is an important predictor for students' academic motivation and students' academic performance (Pothukochi *et al.* 2014). Self-regulation usually mediates the relationship between learner and environment and affects the students' performance or students' academic achievement (Schunk 2005). According to Schunk (2005), academic motivation is actually followed self-regulatory learning but academic motivation is a construct that is separated from the self-regulatory learning. This study aims to examine the relationship models between flexible assessment system, academic motivation, self-regulation and academic performance. This study also examined the models using self-regulation and motivation as mediating variable.

This study did not examine the effect of flexible assessment system directly to the academic performance. This study examined the effect of flexible assessment system in the academic performance mediated by academic motivation and self-regulation. It is based on research results Pacharn *et al.* (2013) which states that flexible assessment system did not directly affect the academic performance, but effect of flexible assessment system on academic performance ss mediated by academic motivation and self-regulation.

Furthermore, previous studies claims that there are differences between men and women motivation (Vansteenkiste *et al.* 2005; Kusurkar *et al.* 2013). The gender differences issue in education in fact has been well documented in recent years and is still doing research to date (Baker 2002; Britner 2008; Meece *et al.* 2006). Velayutham, Aldrige, and Fraser (2012) suggest that there is gender influence in student's academic motivation and self-regulation. According to Meece and Eccles (1993), compared to men, women have lower self-perceptions of their academic ability, but they perform better than men. Pajares and Viliante (2001) also proved in his research on the gender differences in academic motivation and self-regulated learning. Based on a variety of such explanation, the hypotheses that can be arranged are:

H1: Flexible assessment system affects academic motivation.

H2: Flexible assessment system affects self-regulation.

H3: Academic motivation affects self-regulation.

H4: Academic motivation affects academic performance.

H5: Self-regulation affects academic performance.

H6: Academic motivation mediates the effect of flexible assessment system on self-regulation and academic performance.

H7: Self-regulation mediates the effects of flexible assessment system and academic motivation in academic performance.

H8: Gender moderates the relationship model of flexible assessment system, academic motivation, self-regulation, and academic performance.

3. Research methods

3.1. Samples and procedures research

Research was conducted on students' undergraduate program on economics and businesses who were studying in Yogyakarta. Yogyakarta city was chosen because Yogyakarta is known as the first student city in Indonesia. Students from all over Indonesia went to Yogyakarta as their learning goals. Yogyakarta is a city of learning destination of Indonesian people; especially those living on the Java Island are occupied by half the population of Indonesia. In addition, the academic climate is still felt in Yogyakarta. The selection of the research setting was based on previous research. The previous research stated that students will perform well if there is a challenge, curious, and want to do the work independently. This study also examined the relationship model between flexible assessment system, academic motivation, self-regulation, and academic performance.

This study used a survey method using questionnaires carried out its own distribution. The questionnaires were distributed to students as respondents of this study. Respondents were students of undergraduate program on economics and business that is still as active students in Yogyakarta. The survey was conducted about three months (September – November 2015). There are four types of primary data collection methods, especially that using questionnaires. Several methods that can be used in the survey are interviews with direct face to face, a questionnaire was sent or by correspondence, questionnaires were read over the telephone, questionnaires via electronic media, or combination of survey methods (Cooper, Schindler 2008; Neuman 2006; Sekaran, Bougie 2010). Primary data collection method using questionnaires survey conducted by researcher is the best method (Cooper, Schindler 2008; Neuman 2006; Sekaran, Bougie 2010). Research on students' academic motivation is important because academic motivation significantly affect learning in school. In addition, academic motivation has been identified as one of the important and consistent predictors of learning outcomes such as academic performance.

Research used the individual as the unit of analysis requires samples with specific criteria or characteristics. Undergraduate students of economic and business program were selected as respondents because self-regulation is one of the hidden curriculum to prepare students to become independent entrepreneur. Characteristics of the sample were used to convey the characteristics of the sample relative to the population. Research with individuals as the unit of analysis used the sample selection criteria. Sample selection method used in this study was non probability sampling, particularly purposive sampling. Requirement for selected sample was students who were active of undergraduate program on economic and business for four semesters. Students who have been through college for two years and declared free drop out selected as respondents. In addition, this study used self-assessment methods with anonymity. It is intended that students are willing to fill in the questionnaire honestly. The sample consisted of 326 students (with a response rate of 93.14%) of the 350 students. Respondents who were

students of undergraduate program on economics and business who were studying in Yogyakarta received a survey using a pen and paper questionnaires. Respondents were assured anonymity and guaranteed confidentially their answers by researcher completed the survey during study hours in campus.

3.2. Measurement

The instruments were designed for the individuals as unit of analysis. Each of the respondents in this study was asked to complete four measurements, namely flexible assessment system, academic motivation, self-regulation, and academic performance. Questionnaires regarding flexible assessment system was taken and developed by previous researchers, namely Pacharn *et al.* (2013). Academic motivation construct was measured using questionnaires from Nichols and Ultesch (1998). Self-regulation questionnaires were taken from the study Hong and O'Neil (2001), while the academic performance questionnaires were taken from the research of Dyne *et al.* (1994) which had been adapted for educational setting in Indonesia. The questionnaires were adopted with little modification to fit local needs and research setting in Indonesia in the field of academic research. Modifications were made in the questionnaires translated from English into Bahasa Indonesia. Furthermore, the questionnaire was translated back into English (back translation) and adjusted to the learning system in Indonesia.

All item questionnaires measured using Likert scale with 5-point starting from the number 1. This study used factor analysis as a way to examine the construct validity. The testing reliability of the research instrument with internal consistency test was used Cronbach's alpha. Validity test used the varimax rotation with loading factor of at least 0.4 as suggested by Hair *et al.* (2006). Reliability test used Cronbach's alpha with the alpha value at least 0.7 as suggested by Hair *et al.* (2006). Furthermore, before testing the model by using structural equation modelling, researcher used correlation to examine the relationship among all constructs. Next, to examine the relationship model of flexible assessment system, academic motivation, self-regulation, and academic performance was used structural equation modelling (SEM) using AMOS program. Meanwhile, to examine gender as moderating variable was used multigroup SEM. In addition, this study also using independent sample t test to complete the testing of gender differences.

4. Results

4.1. Analysis of validity and reliability

Collecting data in this study used questionnaires that have been developed by some previous researchers. Questionnaires were then translated into Bahasa Indonesia. Testing validity used in this study was content validity and construct validity. Content validity was done by discussing with experts. In accordance with the opinion of Sekaran and Bougie (2010), the questionnaires were also tested to students who have the same characteristics as respondents for improving the questionnaires.

Construct validity testing was done by using the factor analysis technique with orthogonal and varimax rotation. Extraction factor was determined by taking eigenvalue more than one. This study used a loading factor above 0.4 as suggested by Hair *et al.* (2006) indicated that results of testing the construct validity is practically significant. Factor loading recorded value between 0.420 and 0.774. Given all the items noted above extracted 0.4, there were some items that turned out to be removed because these items did not valid. Items that had construct validity based on the results of the factor analysis were then tested for reliability.

Items of questionnaires that have been qualified by construct validity were tested reliability. Reliability testing in this study used internal consistency with Cronbach's alpha values more than 0.7. Based on the results of testing the reliability, instruments that were valid and reliable used in subsequent testing in descriptive statistics. Cronbach's alpha values as the reliability tests measuring instrument in this study resulted in a score of 0.803 for flexible system assessment construct, 0.828 for academic motivation construct, 0.886 for self-regulation construct, and 0.808 for academic performance construct. Cronbach's alpha values of all variables used in this study were above 0.7.

Table 1. Valid and Reliable Questionnaires, Loading Factor, and Cronbach Alpha

Questionnaires	Flexible Assessment System	Academic Motivation	Self Regulation	Performance
Flexible Assessment System3	.574			
Flexible Assessment System4	.503			
Flexible Assessment System7	.500			
Flexible Assessment System9	.420			
Flexible Assessment System10	.566			
Flexible Assessment System11	.666			
Flexible Assessment System12	.612			
Flexible Assessment System13	.507			
Flexible Assessment System14	.595			
Flexible Assessment System15	.672			
Flexible Assessment System16	.637			
Flexible Assessment System19	.527			
Academic Motivation1		.548		
Academic Motivation2		.622		
Academic Motivation3		.532		
Academic Motivation6		.545		
Academic Motivation7		.645		
Academic Motivation8		.662		
Academic Motivation9		.570		

End of Table 1.

Questionnaires	Flexible Assessment System	Academic Motivation	Self Regulation	Performance
Academic Motivation11		.712		
Academic Motivation12		.686		
Academic Motivation13		.572		
Academic Motivation14		.576		
Academic Motivation18		.437		
Self-Regulation1			.642	
Self-Regulation2			.669	
Self-Regulation3			.736	
Self-Regulation4			.743	
Self-Regulation5			.767	
Self-Regulation6			.708	
Self-Regulation7			.497	
Self-Regulation8			.555	
Self-Regulation9			.696	
Self-Regulation10			.774	
Self-Regulation11			.692	
Self-Regulation14			.462	
Self-Regulation16			.475	
Self-Regulation17			.450	
Performance1				.531
Performance2				.480
Performance3				.497
Performance4				.513
Performance5				.450
Performance8				.519
Performance9				.584
Performance10				.588
Performance11				.547
Performance12				.636
Performance13				.617
Performance14				.589
Performance16				.457
Performance20				.483
Cronbach Alpha (α)	.803	.828	.886	.808
N of items	12	12	14	14

Based on the results of the reliability testing, researcher stated that the reliability of the measuring instrument of this study was far above the cut-off line reliability as recommended by Hair *et al.* (2006). Results of testing the validity and reliability with many items that valid and reliable questionnaire presented in the Table 1.

4.2. Descriptive statistics

For performing statistical analysis, the researcher used a series of analysis the relation-ship among all constructs or research variables using bivariate correlation analysis. Correlation between two constructs or variables used in this study was significantly positive. Standard deviation, reliability scale, and correlations among all study variables are presented in Table 2.

Table 2. Mean, standard deviation, DAN correlations between research variables

	Mean	SD	α	1	2	3	4
Flexible Assessment System (1)	3.913	0.2024	0.803	1.000			
Academic Motivation (2)	3.787	0.3286	0.828	0.533**	1.000		
Self-Regulation (3)	3.846	0.1673	0.886	0.508**	0.597**	1.000	
Performance (4)	3.704	0.2665	0.808	0.367**	0.387**	0.559**	1,000

Notes: correlation is significant at the 0.01 level (2-tailed).

Based on Table 2, the mean of three variables was moderate (mean values between 3.704 and 3.913) and the standard deviation was relatively small (standard deviation values between 0.1673 and 0.3286). In addition, all correlations were obtained quite strong. Correlation between flexible assessment system and academic motivation was positive significantly ($r = 0.533$, $p < 0.01$). Correlation between flexible assessment system and self-regulation was positive significantly ($r = 0.508$, $p < 0.01$). Correlation between flexible assessment system and academic performance was positive significantly ($r = 0.367$, $p < 0.01$). Correlation between academic motivation and self-regulation was positive significantly ($r = 0.597$, $p < 0.01$). Correlation between academic motivation and academic performance was also positive significantly ($r = 0.387$, $p < 0.01$). Meanwhile, the correlation between self-regulation and the performance was also positive significantly ($r = 0.559$, $p < 0.01$). That is not too strong correlation between these variables is likely due to the characteristics of the variables in this study.

4.3. Hypothesis testing results

Application of exploratory and confirmatory factor analysis of the data collected was used to test the validity and reliability of measuring instruments. This was due to ex-ploratory factor analysis developed theories about the constructs that make up the meas-uring instrument that was understood by the respondents as samples. Exploratory factor analysis is a statistical method used to found the underlying structure of construct.

Exploratory factor analysis is a technique within factor analysis for identifying the relationships between measured constructs. Meanwhile, confirmatory factor analysis confirmed the theory is built. Exploratory factor analysis is also used to extract a set of relevant factors, whereas confirmatory factor analysis is used to test the model.

Confirmatory factor analysis is also used to examine the discriminant validity of the constructs. Specifically, researcher tested four constructs in the relationship model of flexible assessment system, academic motivation, self-regulation, and academic performance as different latent factors. The strength of the relationship between flexible assessment system, academic motivation, self-regulation, and academic performance were examined through Structural Equation Modelling (SEM). One of the major advantages of SEM is that this model relationships at the item level and explicitly accounting for measurement error (Byrne 2001). Anderson and Gerbing (1988) recommended for analyzing separately the measurement models and structural models. The measurement model was used to confirmatory factor analysis for determining the items used in the study load on constructs. The structural model was used to examine relationships among constructs.

This study used previously published scales to collect data that were relevant for this study. Results of the testing model suggested that there was significant effect of academic motivation and self-regulation as independent variable on the academic performance as dependent variable. Meanwhile, flexible assessment system was not examined directly effect on academic performance, but was mediated by academic motivation and self-regulation. Furthermore, in addition academic motivation also affected self-regulation and both affected academic performance. One of the objectives of this study was examination the influence of academic motivation and self-regulation as mediating variables in the relationship model between flexible assessment system and academic performance. Table 3 describes the results of the mediating test of the model using structural equation models with two-stage approach.

Structural equation model in this study was designed and tested using AMOS 4.0 software Program (Byrne 2001). The structural model determined by allowing each item of every measurement fit on the latent factors. At first, the researcher conducted dimensional analysis using confirmatory factor analysis, which covers all measures to examine the relationship between the unobserved variables and observed variables that serve as indicators of them. Furthermore, the test results of mediation model of academic motivation and self-regulation on the relationship between flexible assessment system and academic performance presented in Table 2. The results showed that the hypothesized model fit to the data ($\chi2 = 6.052$; df = 1, p = 0.014; GFI = 0.991, AGFI = 0.909, CFI = 0.946).

Based on the results of the model testing, flexible assessment system influenced academic motivation and self-regulation positively and significantly (hypothesis 1 and hypothesis 2 were supported). Impact academic motivation on self-regulation and academic performance was also positive significantly (hypothesis 3 and hypothesis 4 were

Table 3. Analysis of mediating model

	Beta (β)	Critical Ratio
Flexible Assessment System à Academic Motivation	0.220	3.602
Flexible Assessment System à Self-Regulation	0.127	2.164
Academic Motivation à Self-Regulation	0.371	6.354
Academic Motivation à Performance	0.150	2.258
Self-Regulation à Performance	0.243	3.668

GFI = 0.991
AGFI = 0.909
CFI = 0.946
p = 0.014
Chi Square = 6.052
Df = 1

supported). Meanwhile, self-regulation had positive effect on academic performance (hypothesis 5 was supported). Based on Table 3, it can be stated that academic motivation mediated the effect of flexible assessment system on academic performance and self-regulation (hypothesis 6 was supported). While self-regulation also mediated the influence of flexible assessment system and academic motivation on performance (hypothesis 7 was supported). This study used a 0.9 for goodness of fit index (GFI), adjusted goodness of fit index (AGFI) and comparative fit index (CFI) as recommended by Byrne (2001). Testing hypotheses 1 through 7 were supported by the goodness of fit index or GFI that is above 0.90. Changes in chi-square test were used to evaluate the best model fit to the data (Byrne 2001). Meanwhile, to test the hypothesis 8 that evaluated the effects of gender differences in this research model used multigroup structural equation modelling (multigroup SEM). The test results of gender as a moderating flexible relationship model assessment system, academic motivation, self-regulation, and performance presented in Table 4.

Based on the results of multigroup SEM in Table 4, chi square (χ^2) for unconstrained models was 4.481 with a degree of freedom 2, while constrained models were 11.130 with a degree of freedom 7. The gender moderating generated chi square value 6.289 and the degree of freedom is 5. The results then compared with the χ^2 table with a significance level of 5%. Based on χ^2 table, chi square value with the degree of freedom 5 was 11.0705. Because the χ^2 value was less than the χ^2 table, the difference was not significant. In other words, gender did not moderate the relationship model flexible assessment system, academic motivation, self-regulation and performance (hypothesis 8 was not supported).

Structural model in Figure 1 shows that academic motivation and self-regulation mediates the effect of flexible assessment system on academic performance. Meanwhile, gender does not moderate the relationship models. This means there is no difference between male and female students in the model of the relationship.

Table 4. Results of Testing Gender as Moderating Variable Using Multigroup SEM

Multigroup SEM Unconstrained Model				
	Pria		Wanita	
	B	CR	B	CR
Flexible assessment system → academic motivation	0.235	2.692	0.222	2.591
Academic motivation → Self-regulation	0.369	4.342	−0.352	4.317
Flexible assessment system → Self-regulation	0.102	1.206	0.165	1.999
Academic motivation → Performance	0.280	2.953	0.051	0.569
Self-regulation → Performance	0.104	1.113	0.422	4.689
GFI = 0.993 Chi-Square = 4.841 df = 2				

| Multigroup SEM Constrained Model				
	Pria		Wanita	
	B	CR	B	CR
Flexible assessment system → academic motivation	0.240	3.714	0.213	3.714
Academic motivation → Self-regulation	0.351	6.119	0.368	6.119
Flexible assessment system → Self-regulation	0.140	2.274	0.130	2.274
Academic motivation → Performance	0.131	2.249	0.163	2.249
Self-regulation → Performance	0.257	4.316	0.305	4.316
GFI = 0.983 Chi-Square = 11.130 df = 7				
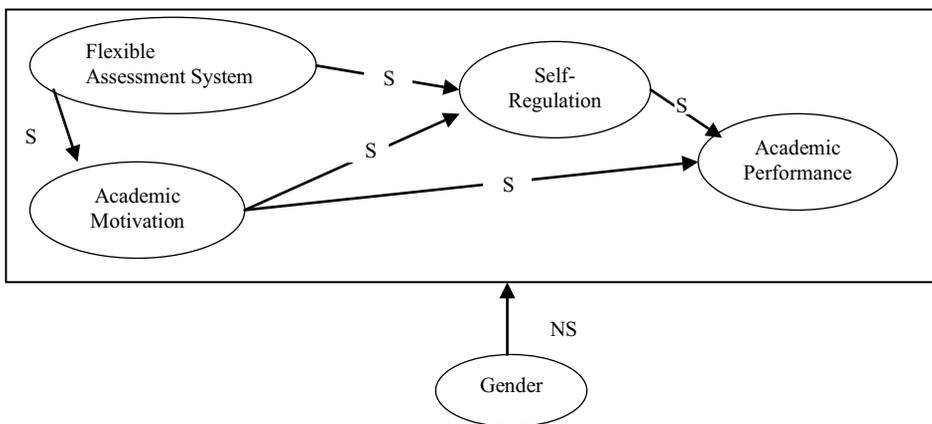
Fig. 1. Relationship model among research variables

Furthermore, the researchers conducted further analysis of gender differences in academic motivation, self-regulation, flexible assessment system, and academic performance. The respondents of this study consisted of 161 males and 165 females. Tests carried out using independent sample t test. The results are presented Table 5.

Table 5. Test Results Gender Differences

		Levene's Test for Equality of Variances		t-test for Equality of Means							
		F	Sig.	t	Df	Sig. (2-tailed)	Mean Diff.	Std. Error Diff.	95% Confidence Interval of the Difference	
									Lower	Upper
ACAD. MOTV.	Equal variances assumed	.036	.851	−.876	324	.382	−.04257	.04858	−.13813	.05300
	Equal variances not assumed			−.877	323.902	.381	−.04257	.04855	−.13808	.05295
FLEX. ASS.	Equal variances assumed	.464	.496	−1.867	324	.063	−.08906	.04771	−.18291	.00479
	Equal variances not assumed			−1.865	320.826	.063	−.08906	.04775	−.18300	.00488
SELF– REG.	Equal variances assumed	.348	.555	−2.362	324	.019	−.11380	.04818	−.20858	−.01902
	Equal variances not assumed			−2.360	322.072	.019	−.11380	.04821	−.20864	−.01895
PERFM.	Equal variances assumed	.412	.522	−.017	324	.987	−.00070	.04242	−.08416	.08276
	Equal variances not assumed			−.017	321.966	.987	−.00070	.04245	−.08422	.08282

Based on test results using independent sample t test it appears that there was no difference between males and females in academic motivation and self-regulation in learning (hypothesis 8 was not supported). In addition, perception of males and females in flexible assessment system was no different. Academic performance between males and females was also no difference. In other words, there was no gender difference among students in Yogyakarta as student city in Indonesia on academic motivation, self-regulation in learning, academic performance, and their perceptions of flexible assessment system.

5. Discussion

Previous research has shown that motivated students were the key to success in the classroom (Pajares 2001; Velayutham, Aldrige 2013). With these motivations, the students' academic achievement will be increased through the increasing students' attendance in the classroom, participation actively in class, ask and explain his opinion, doing the task of individuals or groups, and add time to study. The results of this study present that both academic motivation and self-regulation affect performance. This is consistent with previous studies (Hong, O'Neil 2001; Nonis, Hudson 2006; Kanfer *et al.* 2010; Barrows *et al.* 2013; Pintrich, De Groot 1990). According to Pintrich (2000), many previous studies have examined the relationship between self-regulation, motivation, and performance and the results also showed the same thing.

The results of this study indicated those students' academic motivation influence positively learning strategies and academic performance. This is consistent with the research result of Vansteenkiste *et al.* (2005) and the research results of Sobral (2004). This study also presented that the motivation encourage students doing for self-regulation in accordance with the results of Pintrichs' research (2004). From the review of the research results conducted by Pintrich (2003) concluded that students are more motivated academically will show higher self-regulation in learning. In general, students who have self-regulation were likely to have a high academic performance (Pintrich 2003). Academic motivation is seen as an important factor that encouraged individuals to be bound in self-regulation (Wolters, Hussain 2015). The relationship between students' academic motivation and students' academic performance have been studied regularly in the literature (Ames 1992; Green *et al.* 2006; Peklaj *et al.* 2006; Colquitt *et al.* 2000). Motivation indeed been recorded in education as the variables that affect academic performance through the study effort as a mediator (Vansteenkiste *et al.* 2005). Research results of Kusurkar *et al.* (2010) showed that motivation correlates significantly with good learning strategies and good learning effort.

Meanwhile, flexible assessment system did not have direct effect on academic performance. Flexible assessment system was a system or method of assessment. According Smimou and Dahl (2011), assessment methods determine how well students have performed in class based on various measures as determined by the teacher on the education system. In this study, flexible assessment system affected academic perfor-

mance through academic motivation and self-regulation. This was consistent with the research results of Pintrich (2000) and the research results of Boekaerts and Corno (2005) which stated that self-regulation may mediate the relationship between individual and contextual factors influencing the student achievement or academic performance. Flexible assessment system did not directly affect the students' academic performance. This system actually affected the students' motivation and students' learning strategies. This means that flexible assessment system affected academic performance through academic motivation and self-regulation. Self-regulation is the ability of individuals to control their behavior to achieve the goal. The results of this study indicated that self-regulation affects performance. The results of this study were consistent with the research results of Velayutham *et al.* (2012) which stated that self-regulation in learning are important factors that affect the results of the learning process and determinant of students' academic success.

The researchers acknowledged that learning in school involves the cognitive processes or simple information exchange (Pintrich *et al.* 1993). The variables which are affect learning for example personal choice, individual needs, and motivational beliefs (Pintrich, De Groot 1990). Researchers generally make the motivation as core of learning research. Motivation will encourage the students to be active, to control, to set goals, and doing self-regulation (Pintrich 2004). Students must actively do the learning activities in order to achieve better academic performance. Motivation also encourages self-regulation to control, monitor, and regulate various aspects. Self-regulation is done by determining the objectives, criteria, and standard assumptions. This is what will encourage individuals achieve goals. The results of this study are consistent with the research results of Zimmerman (2002). Zimmerman's (2002) self-regulated learning theory emphasizes the role of motivation in achieving and maintaining students' self-regulation in learning.

This result was consistent with the results research of Pintrich (2004) which states that self-regulation is a mediator between the personal characteristics which in this case is the academic motivation and contextual which in this case is the flexible assessment system. Students who have self-regulation will have higher academic achievement (Velayutham *et al.* 2012; Dunn *et al.* 2012; Cleary, Zimmerman 2004). Furthermore, the linkage of students in the learning process depends on students' self-efficacy beliefs, the perception of the ability to do the work and the results obtained. Other variable in the self-regulation is the effort. Students can arrange their effort will be able to learn better than students who are not able to regulate their effort (Pintrich 2003). Self-regulation is an effortful process that can encourage student achievement. The results of this study indicated that self-regulation is influenced by academic motivation. This was consistent with the research results of Wolters and Hussain (2015) which stated that academic motivation is a factor that encourages individuals to be bound in self-regulation. The results of this study are also in line with the research results of Pintrich and De Groot (1990), which showed a strong relationship between motivation and self-regulation.

The results of this study indicated that there is no difference between men and women in the relationship model proposed in this study. This means that students' academic motivation, self-regulation, academic performance, and perception of flexible assessment system between male and female are not different. The results of this study also indicated that there was no statistically significant mean difference among academic motivation, self-regulated learning, academic performance, and perception of flexible assessment system with respect to gender. The results of this study provide empirical support for the theoretical relationship between cognitive evaluation theories and self-regulated learning strategies in the context of the classroom.

6. Conclusions

Psychologists claim that when people experience a sense of fit between the various important aspects of themselves and environmental aspects, the results or positive and adaptive responses will occur (Rodriguez *et al.* 2013). In the academic achievement domain, fit between students' academic motivation, self-regulation, and the learning environment associated with students' academic performance. The results of this study indicate that academic motivation and self-regulation are powerful influence on academic performance. Learning environment which is in this study shown as a flexible assessment system affects academic performance through academic motivation and self-regulation. The findings of this study highlighted the importance of self-regulation and academic motivation in improving academic performance. This study found that gender had not an impact on the motivation and learning strategies used by undergraduate program on students of economics at private university in Yogyakarta. Based on the results of this study, it can not be recommended that females should be treated differently in courses in comparison to males and vice versa.

Although this article provides empirical support for the proposed model trough seven hypotheses were supported, overcoming the potential limitation of this study provides guidance for further research. One limitation to the present study is the self-report nature of all variables. The use of self-report to assess academic motivation and self-regulation may limit to students' subjective perception. The shared variance inherent in this method suggests that the relations found here may be overstated and bounced beta. Another limitation is the difficulty in making a causal statement or conclusion without longitudinal analysis. This study used cross sectional data that can not be used for examining mediating model. Future research that assessed the flexible system, academic motivation, self-regulation, and academic performance using other valid method should provide useful insights. The third limitation is the use small amounts of data led to this study can not be generalized even for the same research setting. Further research should be able to use the data in larger quantities.

One of the strengths of my study is that we used structural equation modelling approach and have found a well-fitting model for the relationship between flexible assess-

ment system, academic motivation, self-regulation, and academic performance. Despite these limitations, the present study provides a substantial contribution as a preliminary study that links flexible assessment system, academic motivation, self-regulation, and academic performance within an academically and ethnically diverse population of college students. These research findings have implications for both practitioners and academicians, because they demonstrate that assessment system can improve motivation and learning strategies that can ultimately improve performance. One recommendation that can be given to teachers is that teachers can improve student learning through how to teach learning awareness. Learning awareness can not be transformed to the learner but teachers can affect the motivation of the students by interacting with the students and determining appropriate assessment system.

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