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How is the Relationship among Goals, Learning Strategies, and Perceived Competence? Structural Equation Modeling Approach

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Abstracts

This study aims to investigate the relationship between the three models of achievement goals, learning strategies, and perceived competence. The study was conducted with 506 university students participating in undergraduate programs in economics and business for the employee class in Yogyakarta, Indonesia. Data collection was carried out using a survey with distributing questionnaires. Furthermore, correlation analysis for testing the relationship between variables in accordance with the hypothesis was carried out after the questionnaire was declared valid and reliable. Also, a structural equation modeling with two-step approach was used to simultaneously test the relationship model. The model that was found to be the most appropriate was perceived competence mediated the relationship between achievement goals and learning strategies. In addition, the mastery approach was a dimension of achievement goals that consistently and positively influenced each other with deep learning strategies and perceived competence. The perceived competence also consistently and negatively influenced each other with surface learning strategies. The result indicated a consistent relationship and influence between mastery goals, deep learning strategies, as well as perceived competence or between performance-avoidance goals, surface learning strategies, and perceived competence. This study also strengthened the understanding that individuals with high perceived competence have a goal to outperform their peers, but are inconsistent in the selection of strategies. An in-depth discussion of the results along with their contributions and subsequent studies were presented at the end of this article.

Keywords: mastery approach goals, performance approach goals, performance avoidance goals, deep learning strategies, surface learning strategies, perceived competence

Introduction

Contemporary studies repeatedly showed that non-cognitive factors such as motivation affect performance (Lee & Stankov, 2013). This is because it plays an important role in predicting attitudes, strategies, and efforts to set goals for achieving high performance (Jiang et al., 2014). Jiang et al. (2014) showed that the motivational construct with the strongest effect on performance was achievement goals. Meanwhile, some studies showed that there was a relationship between achievement goals, perceived competence, and learning strategies (e.g., Kahraman & Sungur, 2013; Prat-Sala & Redford, 2010). Furthermore, these variables have a mutually influencing relationship and were also discovered to affect academic achievement (Herrmann et al., 2017; Soylu et al., 2017).

Motivation has been considered for a long time as the most important concept in education (Herath, 2015). Research teams still pay a lot of attention to motivation in the learning context, especially in developing student motivation. They also conducted studies with university students as participants for understanding their motivation in academic settings (e.g., Kahraman & Sungur, 2013; Linnenbrink-Garcia & Barger, 2014). Several views about the learning process are based on achievement goal theory (AGT), self-determination theory (SDT), and social cognitive theory (SCT) of motivation in various settings, including universities, and workplaces (Mesmer-Magnus & Viswesvaran, 2010). AGT has been the most widely used motivation theory for more than three decades. Goal theory places mastery goals orientation (MGO) and performance goals orientation (PGO) in influencing various educational outcomes (e.g., Chen & Wong, 2015; Huang, 2012; Steinmayr et al., 2011).

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Studies conducted on this subject in Western countries and Asian contexts have provided much and varied empirical support for using the framework (King & Ganotice, 2013).

In addition to achievement goals, perceived competence is also motivational variables. It is the main construct in social cognitive theory which refers to beliefs and considerations related to their ability for completing tasks (Azar et al., 2010). Perceived competence is mainly used when individuals find tasks or jobs difficult (Bong et al., 2010), while achievement goals are adopted in certain situations (Jiang et al., 2014). The results showed that there was a relationship between learning strategies, perceived competence, and learning outcomes (e.g., Herrmann et al., 2017; Richardson et al., 2012).

Meanwhile, learning strategy is a determining factor in academic performance and knowledge acquisition besides motivation (Cano et al., 2018; Everaert, et al., 2017; Garcia et al., 2016). It is also dynamic and used to achieve learning goals that can develop rapidly (Zlatovix et al., 2015). Student Approach to Learning (SAL) has proposed two different learning strategies, namely deep learning strategies (DLS) and surface learning strategies (SLS) (Fryer & Ginns, 2017; Richardson, 2015). The former prioritizes understanding of the material, while the latter prioritizes memorizing or repeating material (Cano et al., 2018; Heikkila et al., 2012).

The relationship between motivation, strategies in the learning process, and learning achievement has not been adequately examined since the existing study is limited to the western context (Cano & Berben, 2008). Empirical studies on this matter in the context of non-western culture are expected to provide added value that broadens understanding of the need for motivation and goals in student learning outcomes. This study aims to examine the relationship between achievement goals, learning strategies, and perceived competence to understand how students achieve academic performance. The question that arises is whether the students' learning goals and strategies have an effect on estimating their academic performance, or whether the strategy is chosen after the students know their academic performance. There are three models tested in this study. First, learning strategies mediated the relationship between achievement goals and perceived competence as perceived performance. Second, perceived competence mediated the relationship between achievement goals and two learning strategies. Meanwhile, the third model, achievement goals mediated the relationship between perceived competence and learning strategies.

Literature Review and Hypotheses Development

According to Hulleman et al. (2010), achievement goals orientation (AGO) is defined as future cognitive goals that direct competency-related behaviors in which individuals commit to approaching or avoiding the expected final state. It is also the core construct for motivation studies in achievement settings. The approach is conceptualized as cognitive-dynamic goals that focus on competence. Meanwhile, achievement experts define mastery goal orientation (MGO) as developing individual competencies and performance goal orientation (PGO) as showing individual competencies by outperforming their peers (Senko et al., 2011). Both goals are pursued by students during their learning process because they are not being mutually exclusive and do not contradict (Martinez-Monteagudo et al., 2018). Therefore, individuals may have two goal orientations and they can be characterized accordingly. They can provide principles that underlie strategies for learning. The multiple goals view states that students can simultaneously use multiple goals in school settings (Wormington & Linnenbrink-Garcia, 2017).

There are two main dimensions of achievement goals, each of which has an approach and avoidance dimension. AGO is divided into four dimensions, namely mastery-approach goal orientations (MApG), mastery-avoidance goal orientations (MAvG), performance-approach goal orientations (PApG), and performance-avoidance goal orientations (PAvG), they are independent but correlated with each other (e.g., Duchesne et al. 2017; Hackel et al., 2016). Several studies showed that approach and avoidance goals are associated with positive and negative outcomes respectively (e.g., Linnenbrink-Garcia et al., 2012; Zhou & Wang, 2019). MApG (motivate to master the material and increase knowledge) consistently tends to be associated with positive outcomes (Pantziara & Philippou, 2014; Scherrer et al., 2020). Meanwhile, PAvG (avoid looking like a failure) is consistently associated with less adaptive outcomes (Hall et al., 2016; Turner et al., 2021). PApG studies reported inconsistent results (Senko et al., 2013). Some studies stated that PApG (shows relative competence to others) was associated with positive outcomes (Senko & Dowson, 2017; Zhou & Wang, 2019) while some disagreed Daniels et al., 2009).

Furthermore, MAvG (avoid situations where the individual is unable to learn) is rarely used because it is difficult to conceptualize (Gore, 2014). Until now, it is still poorly understood how students interpret MAvG (Linnenbrink-Garcia & Barger, 2014). Usually, this goal orientation is associated with maladaptive outcomes

(Bjornebekk et al., 2013). Senko and Freund (2015) stated that MAvG is not always detrimental. It is chosen when the material to be studied is difficult, not well understood or students are still in the first semester of college (Turner et al., 2017). Previous studies suggested that adopting MAvG is not as important as adopting MApG (Baranik et al., 2010) or as important as PApG, and PAvG. Therefore, the MAvG dimension was not used in this study. It is not as prominent as the other achievement goals dimension because the construct and predictive validity of this dimension is relatively unknown (Baranik et al., 2010). The results of research by Baranik et al. (2010) also found that MAvG is always associated with negative outcomes

In addition to achievement goals which are motivational variables, learning strategy is a key factor influencing academic achievement (Chen et al., 2015). Studies on the relationship between learning strategies and achievement goals still need to be conducted. Achievement goals are sensitive to contextual influences on learning (Dinger & Dickhauser, 2013) and learning strategies (Paulick et al., 2013). The research team stated that the relationship between the two constructs was proven in empirical studies (e.g., Asikainen & Gijbels, 2017; Luftenegger et al., 2016; Martinez-Monteagudo et al., 2018). Each MGO and PGO has consequences. Individuals may pursue different achievement goals because they are driven by specific achievement motivations related to their culture (Abd-El-Fattah & Patrick, 2011). Individuals who adopt MGO generally have adaptive behaviors, such as having a large business and using deep or meaningful learning strategies (King & Ganotice, 2013).

Students learning strategies or approaches are divided into two general categories, namely low or surface-level strategies (SLS) and high or deep level strategies (DLS) (Kadioglu & Kondakci, 2014). They are both mutually exclusive strategies (Everaert et al., 2017). At DLS, students try to understand what is learned. This is carried out by involving thinking and integration between learning components and assignments. Furthermore, it includes deep motives, such as an interest in ideas or learning, while SLS includes motives for fear of failure and using rote learning strategies without using ideas (De la Fuente et al., 2017). DLS includes a rehearsal strategy, while the alternative includes elaboration and organization (Kadioglu & Kondaksi, 2014). It also requires a higher cognitive level and helps conceptual understanding, while SLS is used for simple tasks, such as remembering and repeating information until students remember (Luftenegger et al., 2016).

Logically, both learning strategies can comprehensively improve attainment grades (Cano et al., 2018; Everaert et al., 2017). Fox et al. (2010) affirmed that successful students will adopt both by combining an understanding of the material and organizing studies or awareness of assessment requirements. Motivation and learning strategies are related to one another, therefore, they can explain academic performance (Garcia et al., 2016). MGO is associated with a set of positive and adaptive affective processes, such as adopting DLS, whereas PGO is considered maladaptive and is associated with negative motivation and cognition like the use of SLS (Martinez-Monteagudo et al., 2018). Several studies indicated that there was a positive relationship between DLS and performance (e.g., Chen et al., 2015; Herrmann et al., 2017; Murayama et al., 2013; Shearer et al., 2015) or a negative relationship between SLS and performance (e.g., Baeten et al., 2010; Garcia et al., 2016; Yaratan & Kasapoglu, 2012). Meanwhile, Elias (2005) discovered no significant effect of DLS on performance but confirmed the negative relationship between SLS and academic achievement. Students with DLS and those with SLS aim to understand and reproduce the material respectively (Everaert et al., 2017).

Furthermore, a relationship between achievement goals, learning strategies, and perceived competence was also discovered (e.g., Mason et al., 2013; Pantziara & Philippou, 2014; Turner et al., 2021). Perceived competence is a belief that they can do well in an academic setting, feel comfortable, never give up, and perform better (Bandura, 1997). It refers to individuals' thoughts that they can successfully achieve a certain performance level (Pantziara & Philippou, 2014). It was also stated that high and low perceived competence were related to approach and avoidance goals respectively (Lee & Mao, 2016). Meanwhile, some studies showed that the perceived competence is antecedent achievement goals (Azar et al., 2010) however, some indicated that they were consequences of achievement goals Mentis-Koksoy & Aydiner-Uygun, 2018). Perceived competence is also influenced by DLS and SLS (Aydiner-Uygun, 2020; Cano et al., 2018).

Some studies concentrated on the relationship between AGO and learning strategies or grades in the class (e.g., Geitz et al., 2015; Koopman et al., 2014). As motivation variables, AGO also arouses individuals for choosing learning strategies or approaches (Chai et al., 2016; Rashid & Rana, 2019). Furthermore, culture influences the learning strategies used (McLaughin & Durrant, 2017). There is evidence that educational outcomes are related to learning strategies (e.g., Everaert et al., 2017; Senko et al., 2013; Wyn-Williams et al., 2016). In an educational concept, DLS relates to MGO, SLS to PGO (Aydiner-Uygun, 2020; Chen et al., 2015; Chotitham et al., 2014; Herrmann et al., 2017; Geitz et al., 2015; Ohrstedt & Lindfors, 2019), while PApGO and PAvGO relate to SLS (Abd-El-Fatta, 2018; Ferla et al., 2010).

High perceived competence is associated with MGO and PApG, but usually, only individuals with MGO use DLS, while SLS is associated with low perceived competence and PavG (Azar et al., 2010; Prat-Sala & Redfort, 2010).

Based on previous studies, there are three models of the relationship that can be developed between these variables. The first model is learning strategies mediating the relationship between achievement goals and perceived competence as perceived performance. In other words, achievement goals affect the selection of learning strategies used, while learning strategies affect perceived competence.

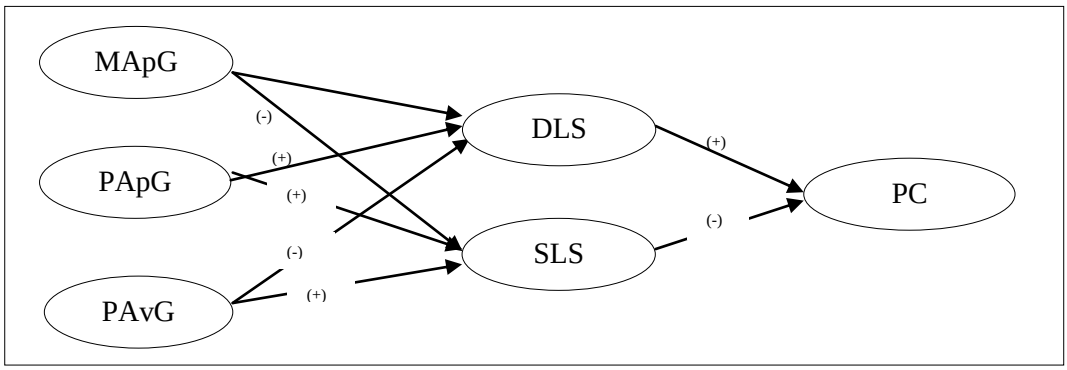

Figure 1. First Model: Learning Strategies Mediate the Effect of Achievement Goals on Perceived Competence

Zubkovic and Kolic-Vehovec (2014) stated that achievement goals are predictors of strategies used in learning. Students adopt learning strategies after setting achievement goals, hence, the right learning strategies can produce achievements. Empirical evidence showed that the goals pursued by students are related to the learning strategies used (e.g., Abd-El-Fatta, 2018; Everaert et al., 2017). Broadbent and Poon (2015) showed a relationship between motivation, strategy, and learning achievement. Learning strategies play a mediator role in the relationship between motivation and learning performance (Lin et al., 2017; Zhou & Wang, 2019). Lin et al. (2017) and Wang et al. (2013) explicitly stated that goal orientation affects performance through learning strategies.

The second model, perceived competence mediates the relationship between achievement goals and two learning strategies. Achievement goals have different effects on perceived competence (Hiver & Al-Hoorie, 2016; Turner et al., 2021). Furthermore, learning strategies selection is carried out after the students can perceive their academic abilities. Individuals who perceive high abilities will choose a deep learning strategy, while those who perceive low abilities will adopt a surface learning strategy (Ohrstedt & Lindfors, 2016).

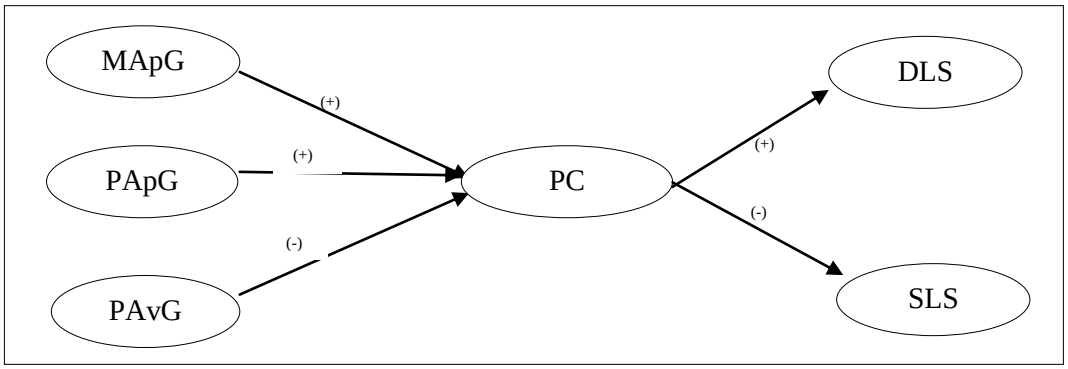

Figure 2. Second Model: Perceived Competence Mediates the Effect of Achievement Goals on Learning Strategies

The effect of goal orientation on academic achievement has been studied extensively (e.g., Huang, 2012; Zhou & Wang, 2019). Academic achievement is not only a grade point average (GPA) but can be a student's ability perception (perceived competence) which involves the perception of personal abilities to achieve the expected results (Bong & Skaalvik, 2003). Goal orientation uniquely affects perceived performance or perceived competence (Bipp & van Dam, 2014; Bjornehekk et al., 2013; Diseth & Kolbeltvedt, 2010; Scherrer et al., 2020). Generally, MApG and PAvG have positive and negative effects on perceived competence respectively (e.g., Mason et al., 2013; Mentis-Koksoy & Aydiner-Uygun, 2018; Senko et al., 2013).

The effect of PApG on perceived competence is inconsistent. Several studies showed that it had a positive effect (e.g., Chen & Wong, 2015; Honicke & Broadbent, 2016; Senko & Dowson, 2017). Students with MApG and PAvG usually use deep and surface learning strategies respectively (Shyr et al., 2017). In addition, individuals with high perceived competence prefer DLS to SLS (Gargallo et al., 2015).

The third model, achievement goals mediate the relationship between perceived competence and learning strategies. It shows that the achievement goals are based on students' perceptions of the goals to be achieved. Students will set goals to increase and deepen knowledge or show ability beyond their peers when they believe in their abilities. Meanwhile, they will set goals to avoid appearing incapable when indeed they feel that they are not capable.

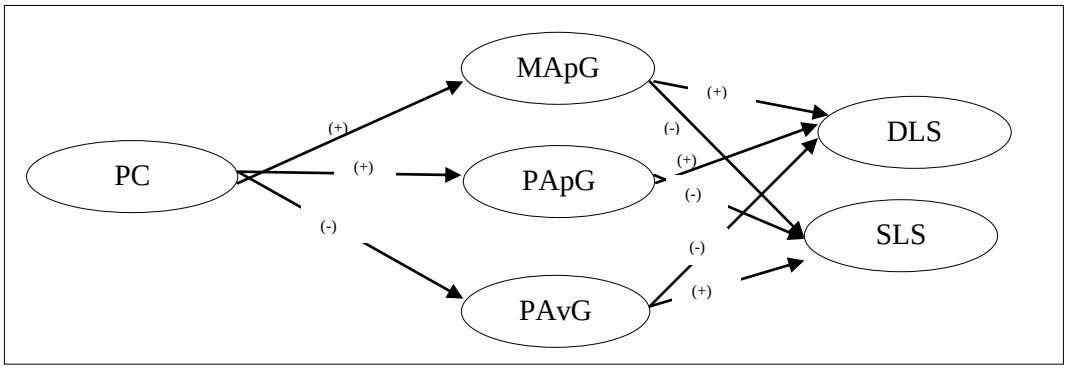

Figure 3. Third Model: Achievement Goals Mediate the Effect of Perceived Competence on Learning Strategies

When students believe that they can achieve high performance, they will choose higher goal achievement or set goals for mastery of the material (Honick & Broadbent, 2016; Jiang et al., 2014). Also, students with high perceived competence will adopt MApG and PApG, while those with low perceived competence will adopt PAvG (Liem et al., 2008; Kizilgunes et al., 2009). Meanwhile, MApG positively influences DLS (Azar et al., 2010), and in an educational context, MGO is associated with DLS and PGO with SLS (Shyr et al., 2017). Mastery goals can predict learning strategies while performance goals do not, because they are negatively correlated with achievement (Pantziara & Philippou, 2014). Mastery-oriented students process learning information at a deep level (e.g., Aydiner-Uygun, 2020; Koopman et al, 2014; Mason et al., 2013; Shyr et al., 2017; Soyer & Kirikkanat, 2018; Zubkovic & Kolic-Vehovec, 2014). Meanwhile, the PGO relationship is diverse and controversial (De la Fuente et al., 2017; Zhou &Wang, 2017). PApG relates to the use of SLS (e.g., Abd-El-Fatta, 2018; Hoffman et al., 2019; Koopman et al., 2014; Senko et al., 2013, Shearer et al., 2015) and DLS (e.g., Abd-El-Fatta, 2018; Geitz et al., 2015). However, according to other research teams, there was no relationship between PApG and the two levels of learning strategies (Elliot, 1999).

Methods

Participants

This study was conducted on students at the employee class who were actively studying at a private university in Yogyakarta, Indonesia. Students in this employee class are unique, because they generally study in the afternoon and evening while they work in government or private companies from morning to noon every day. The sample selection was carried out using a purposive sampling technique for eight months. Moreover, the respondents were students who have been studying for at least two years. This was because they are evaluated in the first two years for eligibility to be able to continue lecturing or not and also choose the field of specialization. This is in accordance with the provisions of the Ministry of Higher Education in Indonesia. The specialization reflects the students' motivation and the strategies they choose to complete college. In this study, 506 students participated as respondents from 1000 students who were given questionnaires (response rate = 50.6%). The number was determined based on multivariate criteria which required a minimum number of respondents equal to five times the number of question items used in this study. The questionnaires contained 30 items, therefore, the minimum sample was 150 people. In addition, confirmatory factor analysis was used as a tool to test the validity of the questionnaire. According to Hair et al. (2014), factor analysis requires a minimum of 300 respondents. Based on these considerations, 506 respondents were deemed sufficient to meet the requirements.

Measurement Scale

This study used a questionnaire adopted from Elliot and McGregor (2001) to measure the AGO dimensions and from Biggs et al. (2001) to measure two learning strategies.

Meanwhile, a six-item questionnaire used in measuring perceived competence was adopted from Kaplan and Maehr (1999). 5 items of MApG questions (for example, *It is important for me to understand this course material as completely as possible*, $\alpha = 0.866$), 5 items of PApG questions (for example, *It is important for me to perform better than other students,* $\alpha = 0.839$), and 4 items of PAvG questions out of 5 items used (for example, *I just want to avoid poor performance in class,* $\alpha = 0.722$) were valid and reliable. Meanwhile, for the learning strategy, 5 items of DLS questions (for example, *I spent a lot of free time to discover more about interesting topics that have been discussed in class,* $\alpha = 0.806$), and 5 items of SLS questions (for example, *I learned some things by memorizing repeatedly until I know it even though I don't understand it*, $\alpha = 0.702$) were valid and reliable. Finally, 6 perceived competence items (for example, *even though the coursework is difficult, I can do it,* $\alpha = 0.838$).

Procedures

This study used primary data through a questionnaire distributed to students who were still active for at least two college years. The questionnaire utilized a five Likert Scale which ranged from very disagree to strongly agree. A content validity test was conducted by asking an organizational behavior expert to evaluate the question items. Some students were also asked to read the questionnaires before distributing to the respondents.

Furthermore, the construct validity was tested with confirmatory factor analysis (CFA) and reliability with the internal consistency of the questionnaire after obtaining the questions. The validity test was carried out using CFA with a loading factor of more than 0.5 or practically significant (Hair et al., 2014). Meanwhile, reliability testing using Cronbach Alpha was at least 0.7 as suggested by Hair et al. (2014). Correlation analysis was conducted to test the relationship between the two variables used in this study. A two-step approach in structural equation modeling (SEM) using AMOS was used to test the four dimensions effect of AGO on two dimensions of learning strategies.

Results

Validity and Reliability Analysis

After testing the construct validity by factor analysis with a loading factor of more than 0.5 and reliability testing with a Cronbach Alpha of at least 0.7, subsequently, 14 from 16 question items used for AGO testing were declared valid and reliable. The loading factor ranged between 0.529 and 0.859. The five-question items in MApG had a loading factor from 0.624 to 0.856 and Cronbach Alpha of 0.866. The five-question items in PApG gave a loading factor from 0.569 to 0.845 and Cronbach Alpha 0.839. The four-question items in PAvG had a loading factor from 0.529 to 0.807 and Cronbach Alpha 0.722. Meanwhile, the 10 questions items used to test the learning strategies showed that all the items were declared valid and reliable. The loading factor for the ten items in question ranged from 0.601 to 0.805. The five-question items in DLS showed a loading factor from 0.615 to 0.805 and Cronbach Alpha of 0.806. The five-question items in SLS gave a loading factor between 0.601 and 0.706 and Cronbach Alpha 0.702. Moreover, the six question items in perceived competence showed a loading factor from 0.582 to 0.830 and Cronbach Alpha of 0.818.

Descriptive Statistics

After the questionnaire was declared valid and reliable, correlation testing was conducted to examine the relationship between variables used and to test multi-collinearity between independent variables when the correlation between independent variables was more than 0.8. In addition, the mean was required to analyze the goals being pursued, the students' learning strategies, and the perceived competence. Standard deviation was also needed to analyze deviations that may arise when the calculation is repeated. Descriptive statistics and correlation results are presented in Table 1.

Tabel 1. Mean, Standard Deviation, Reliability, and Correlations between Variables

	1	2	3	4	5	6
Performance-Avoidance Goals (1)	1.000	0.312**	0.091*	0.053	0.426**	0.001
Performance-Approach Goals (2)		1.000	0.495**	0.346**	0.156**	0.347**
Mastery-Approach Goals (3)			1.000	0.562**	- 0.044	0.423**
Deep Learning Strategies (4)				1.000	- 0.067	0.503**
Surface Learning Strategies (5)					1.000	- 0.154**
Perceived Competence (6)						1.000
Mean	3.4570	3.6379	4.0040	3.5621	3.3004	3.7289
Standard Deviation	0.6638	0.6530	0.5960	0.5729	0.6021	0.6015
Cronbach Alpha	0.722	0.839	0.866	0.806	0.702	0.838

Notes: **p < 0.01 level (2-tailed)
*p < 0.05 level (2-tailed)

Table 1 showed that there was no correlation between the two learning strategies used by students. DLS was significantly and positively related to MApG as well as PApG and was not significantly related to PAvG. Meanwhile, SLS was significantly and positively related to PAvG and PApG. There was no correlation between SLS and MApG. The three dimensions of AGO were positively correlated, except between MApG and PavG. Furthermore, perceived competence was positively correlated with PApG, MApG, as well as DLS, and was negatively correlated with SLS. Meanwhile, PavG was not significantly correlated with perceived competence. The average DLS and perceived competence were high (more than 3.67), while the other four variables were moderate (between 2.34 to 3.66). Moreover, all the variables in this study had a high standard deviation (more than 0.50), which indicated that the respondents independently filled out the questionnaire.

Simultaneous Model Testing Results

Based on the testing results, the three relationship models proposed in this study are shown in Table 2, 3, and 4. The first model was not modified, but not all effects were significant. Meanwhile, the second and third models were modified according to the existing theory or data, and there were some insignificant effects.

Table 2. First Model Testing Results: Learning Strategies Mediate the Effect of Achievement Goals on Perceived Competence

	Std. Regr. (□)	Critical Ratio CR)
MApG → DLS	0.571*	9.919
PApG → DLS	0.162**	2.658
PAvG → DLS	-0.057	-1.121
MApG → SLS	-0.133	-1.888
PApG → SLS		-0.038
PAvG → SLS		10.069
DLS → PC	0.582**	12.370
SLS → PC	-0.243**	.812
Chi-square = 15.204		
GFI = 0.990 AGF		CFI = 0.982
NFI = 0.977 TLI = 0.9		IFI = 0.983
RMR = 0.009 ERMSEA = 0.074		

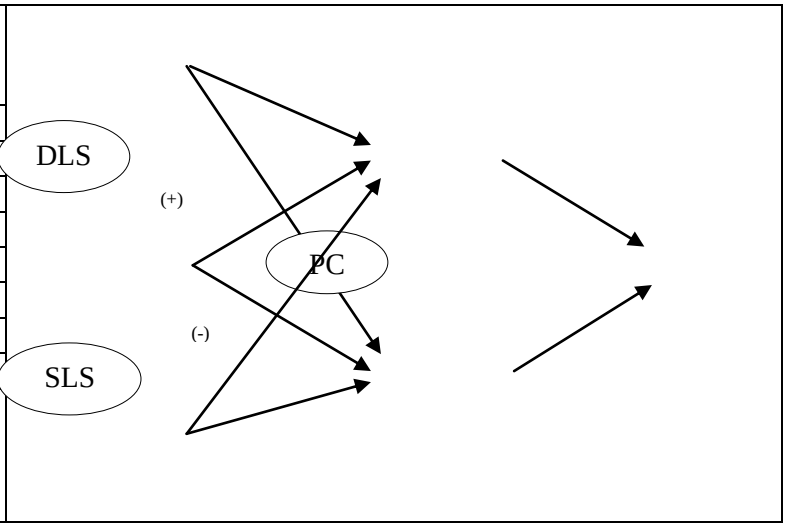

Table 2 showed the testing results of the first model, which indicated that DLS was positively affected by MApG and PApG, while SLS was positively affected by PAvG. This is consistent with previous studies (e.g., Diseth, 2011; Koopman et al, 2014; Zubkovic & Kolic-Vehovec, 2014). Furthermore, DLS can increase perceived competence, while SLS can reduce perceived competence. This is consistent with previous studies (e.g., Garcia et al., 2016; McInerney et al., 2012; Ohrstedt & Lindfors, 2016). DLS that emphasizes understanding and experience, with an emphasis on critical thinking and knowledge needs to be supported by the goals pursued by students, both the goal of mastering knowledge and the demonstrating more abilities than others. Meanwhile, SLS is supported by the goal of students who do not want to appear less capable or less successful.

This fear encourages students to use memorization strategies without understanding the material being studied. The first model test results were consistent with the previous studies that learning strategies mediate the relationship between motivation and perceived competence (e.g., Lin et al., 2017; Zhou & Wang, 2019). The positive effect of DLS and the negative effect of SLS on perceived performance also confirmed previous results (e.g., Chen et al., 2015; Everaert et al., 2017; Garcia et al., 2016; Murayama et al., 2013; Shearer et al., 2015; Zheng et al., 2018). According to the second model testing, some modifications were supported by theory and match the existing data. The second model discovered a direct effect of MApG on DLS and PAvG on SLS. The modification results are presented in Table 3.

Table 3. The Second Model Testing Results: Perceived Competence Mediate the Effect of Achievement Goals on Learning Strategies

	Std. Regr. Weights	Critical Ratio (CR)
MApG → DLS		10.244
MApG → PC	0.308**	3
PApG → PC	0.245**	3.635
PAvG → PC	**	2.051
PAvG → SLS		).97(
PC → DLS	0.359**	7.314
PC → SLS	-0.203**	2.904
Chi-square = 1.708 df =		
GFI = 0.999 AGFI =		FI = 1.000
NFI = 0.997 TLI = 1.016		IFI = 1.005
RMR = 0.001 RMSEA = 0.000		

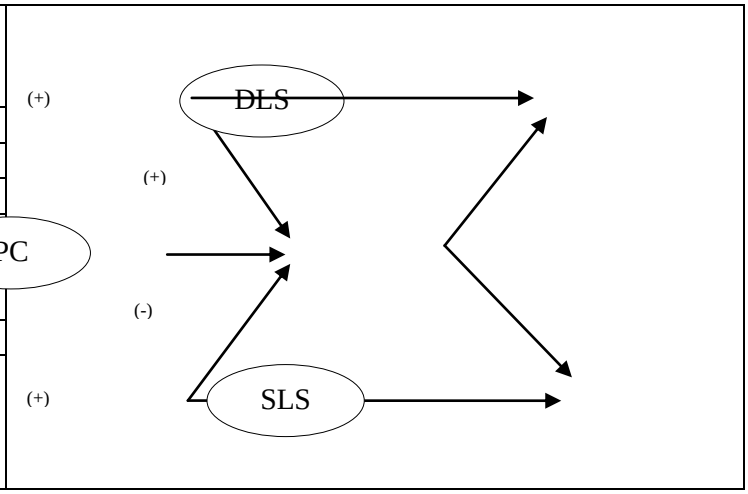

Table 3 showed that approach goals positively influenced perceived competence, while avoidance goals had a negative effect. The testing results of this model were consistent with previous studies (e.g., Mason et al., 2013; Soylu et al., 2017; Turner et al., 2021; Zafarmand et al., 2014). High or low perceived competence was influenced by the goals to be achieved. Generally, approach goals can increase confidence that is capable of obtaining certain achievements. Meanwhile, avoidance goals will reduce perceived competence. Perceived competence positively influenced DLS and gave a negative effect on SLS. High perceived competence encourages individuals to choose learning strategies that prioritize material deepening, while individuals with low perceived competence tend to memorize material without understanding it properly (Geitz et al., 2016; Shen et al., 2016; Kulakow, 2020). Furthermore, MApG and PAvG affected DLS and SLS respectively. The direct influence of achievement goals on this learning strategy was consistent with previous studies (e.g., Diseth, 2011; Koopman et al., 2014; Shyr et al., 2017; Zubkovic & Kolic-Vehovec, 2014).

Furthermore, the third model required the most modifications because there was no match between theory and existing data. This can be seen in the modified index and the difference between the goodness-of-fit index (GFI) as well as the adjusted goodness-of-fit index (AGFI). The third model modification results are presented in Table 4.

Table 4. Third Model Testing Results: Achievement Goals Mediate the Effect of Perceived Competence on Learning Strategies

		Std. Regr. Weights (□)	Critical Ratio (CR)
PC → MApG		0.266**	5.463
PC → PApG		0.390**	7.862
PC → PAvG		-0.173**	-3.811
MApG → DLS		0.492**	10.193
PApG → SLS		[illegible]	0.270
PAvG → SLS		[illegible]**	0.948
PApG → MApG		0.468**	9.732
PApG → PAvG		0.344**	5.627
PC → DLS		0.351**	7.049
PC → SLS		-0.204**	-3.805
	Chi-square = 5.750 df = 5 GFI = 0.996 AGFI = 0.984 CFI = 0.999 NFI = 0.991 TLI = 0.996 IFI = 0.999 RMR = 0.003 RMSEA = 0.017		

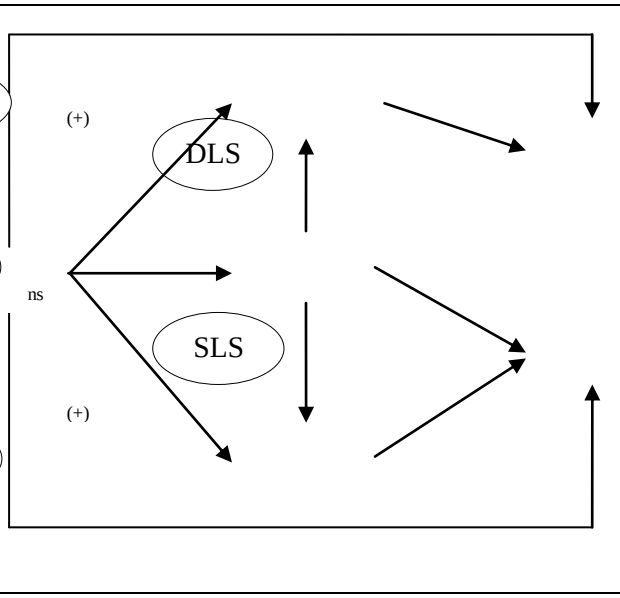

Table 4 showed that perceived competence only positively influenced approach goals and showed a negative effect on PavG. Individuals with high perceived competence will set higher goals, both to increase knowledge and to outperform their friends. This is consistent with previous studies by researchers (e.g., Azar, 2010; Bruning et al., 2013; Lee & Mao, 2016). MApG and perceived competence consistently influence DLS. Meanwhile, PAvG consistently had a positive effect on SLS. The existence of a relationship or influence between perceived competence, motivation, and learning strategies was consistent with previous studies. Besides being influenced by PAvG, SLS was also influenced by perceived competence. Perceived competence decreased the use of learning strategies by memorizing. In this third model, PApG influenced MApG dan PAvG. In other words, the superior desire compared to others encourages individuals to increase their knowledge. In addition, individuals who want to show their prowess also don't want to appear failed or incapable. This is in line with previous studies which reported that the combination of mastery and performance goals can motivate individuals more (e.g., Pantziara & Philippou, 2014; Senko et al., 2011; Wormington & Linnenbrink-Garcia, 2017).

Among the three relationship models based on the theory and previous studies, the model that most aligned with the theory and previous results or mostly appropriate to the existing data was selected. As a comparison, various criteria were chosen. The comparison of the model's test results is presented in Table 5.

Table 5. Model Fit Index

	Chi-Square/DF	**GFI**	**AGFI**	**CFI**	**RMR**	**RMSEA**	**NFI**	**IFI**	**TLI**
Model 1	3.801	0.990	0.948	0.982	0.009	0.074	0.977	0.983	0.934
Model 2	0.342	0.999	0.995	1.000	0.001	0.000	0.997	1.000	1.000
Model 3	7.425	0.968	0.904	0.924	0.016	0.113	0.920	0.930	0.848

GFI = Goodness of Fit Index
AGFI = Adjusted Goodness of Fit Index
CFI = Comparative Fit Index
RMR = Root Mean-square Residual
RMSEA = Root Mean Square Error of Approximation
NFI = Normed Fit Index
IFI = Incremental Fit Index
TLI = Tucker-Lewis Index

The model testing results showed that the three models were in accordance with the theory and data based on absolute fit indices criteria (GFI > 0.95, AGFI > 0.95, RMR < 0.08 according to Hooper et al., 2008 suggestion). However, based on Chi-square/DF criteria as proposed by Hooper et al. (2008), the second model

which had the smallest Chi-square/DF value was the best. Likewise, with the criteria for RMSEA < 0.07, only the second model met the absolute suitability requirement (Steiger, 2007).

However, based on the criteria for NFI > 0.95, comparative fit index or CFI > 0.95, and TLI > 0.95 as suggested by Hooper et al. (2008), the third model did not meet the NFI requirements. Therefore, the second model was the best as it met the requirements of conformity in SEM.

Discussion

The main objective of this study was to examine the relationship and influence of the three dimensions of achievement, two learning strategies, and perceived competence as perceived performance. The results showed that approach goals were significantly positively related to perceived competence and learning strategies. DLS was positively related to the approach dimensions (MApG and PApG). In line with previous studies (e.g., Aydiner-Uygun, 2020; Geitz et al., 2015). SLS had a positive relationship with both PApG and PAvG. This results support previous studies (e.g., Abd-El Fatta, 2018; Chan et al., 2012; Hoffman et al., 2019; Lee et al., 2016; Senko et al., 2013).

Furthermore, the results supported most previous studies, such as the positive relationship between DLS and MApG (e.g., Aydiner-Uygun, 2020; Azar et al., 2010; Geitz et al., 2015; Hulleman et al., 2010; King et al., 2014). DLS was associated with PApG. This was in line with Geitz et al. (2015) and Lee et al. (2016), and contrary to Chan et al. (2012) and Senko et al. (2013) which stated that DLS was unrelated to PApG. The role of PApG in learning strategies was less clear because it was positively related and on the other hand, it was related to maladaptive processes, however, it was also discovered that this goal orientation was not related to learning strategies (Lee et al., 2016). The results showed that the dimensions of the achievement goals were different, but there was a correlation. This is consistent with previous studies (e.g., Gonida et al., 2008; Huang, 2012). In addition, there is no approach which states that the three dimensions in the achievement goals should be used together or separately (Senko & Tropiano, 2016; Winberg et al., 2019). In line with previous studies, the correlation between all AGO dimensions was low to moderate (e.g., Fernandez-Rio et al., 2017; Korpershoek et al., 2014).

This was supported by previous studies which stated that the correlation between mastery and performance goals differed between Western and Eastern cultures. Studies conducted in Western countries showed that both goals were negatively correlated (Litalien et al., 2017). Meanwhile, they were significantly positive for the same study in eastern countries (Liem et al., 2008). This is in accordance with Zusho and Clayton (2011) who stated that culture influences the types of goals that energize behaviors related to achievement. The correlation between dimensions of achievement goals orientation showed that the use of more than one goal orientation can encourage maximizing individual motivation.

It was also indicated that there was no relationship between DLS and SLS. The results were consistent with previous ones which indicated that the two learning strategies were independent and can be used together (e.g., Cano et al., 2018; Maciejewski & Merchant, 2016; Zakarya et al., 2020). DLS was related to individual internal factors and is an adaptive process, while SLS was related to external factors, therefore, it is a maladaptive process (e.g., Koopman et al., 2014; Lee et al., 2016; Linnenbrink-Garcia & Patall, 2016). Perceived competence was positively and negatively correlated with DLS and SLS respectively. This is consistent with the previous studies (e.g., Borgonovi & Pokropek, 2019; Shen et al., 2016; Trigwill et al., 2013; Zakariya et al., 2020). Perceived competence was not correlated with avoidance goals, although PAvG was proven to reduce perceived competence or vice versa, therefore, individuals with low perceived competence adopted this goal orientation (Azar et al., 2010; Liem et al., 2008).

Model testing results using SEM with a two-step approach showed that perceived competence mediate the effect of achievement goals on learning strategies. MApG had a direct effect on DLS, while PAvG directly influenced SLS. DLS was only influenced by MApG, not PApG (e.g., Aydiner-Uygun, 2020; Azar et al., 2010; Kadioglu & Kondakci, 2014). Meanwhile, SLS was influenced positively and significantly by PAvG. This is in accordance with Abd-El-Fatta, 2018, Aydiner-Uygun (2020), Everaert et al. (2017), McLaughlin & Durrant (2017), and King et al. (2014).

SLS was positively influenced by PAvG but negatively affected by MApG. In other words, students who don't want to be judged badly by others choose memorization strategies in their learning. However, those who want to master learning material will not choose memorizing strategies in learning. In addition, the results supported the need for a combination of MGO and PGO to improve learning (e.g., Abd-El-Fatta, 2018; Senko & Tropiano, 2016). This study reinforced that approach goals affected positive outcomes and avoidance goals on

negative results because DLS was seen as more positive than SLS in learning (e.g., Everaert et al., 2017; Linnenbrink-Garcia et al., 2012).

Meanwhile, perceived competence was only correlated with approach goals, mastery or performance, and was also related to both learning strategies. According to this study, learning strategies were correlated with perceived competence (e.g., Chen et al., 2015; Herrmann et al., 2017; Richardson et al., 2012). The results of testing the relationship model with a two-step approach in SEM showed that perceived competence affected learning strategies. This is support the previous studies (e.g., Geitz et al., 2016; Kulakow, 2020; Shen et al., 2016).

The mean calculation result of AGO four dimensions showed that the highest MApG average was compared to other dimensions. This condition is consistent with previous studies (e.g., Baranik et al., 2010; Fernandez-Rio et al., 2017; Ratelsdorf et al., 2010) and also indicated that MGO was stronger than PGO. The higher level of MGO compared to PGO was because this study was conducted at the beginning of the semester like Senko et al. (2011). Students still have the desire to understand and master the learning material they receive in class. In addition, the average approach goal was higher compared to the avoidance goal. These results were in line with previous studies (e.g., Huang, 2012; Tuominen-Soini et al., 2011) and contradicted by Anderman and Anderman (1999) who stated that during adolescence, students tended to focus on PGO. Therefore, this indicated that generally, students want to understand and master the material and want to be judged better than others compared to the fear of not mastering the material, and the worries are considered worse than others.

Conclusion

Although MGO and PGO are mutually exclusive dimensions, this study indicated that they were correlated, although not all of them. Some students can be high in one dimension and low in another, while there are students who are high in both. According to the results, MApG positively influenced DLS but consistently had a negative effect on SLS. Competency development combination, mastery of new material, demonstrating competence, and obtaining positive assessments from others influence students' efforts to understand what is learned, understand or work with learning concepts and ideas, without memorizing learning material. MApG is an achievement goal orientation dimension that influences DLS either directly or indirectly through perceived competence. Likewise, PAvG consistently increased the use of SLS as it was chosen by individuals with low perceived competence.

Achievement goals, learning strategies, and perceived competence are indeed three variables that influence each other. Each of them can be as antecedents and consequences. However, the most appropriate relationship model with existing theory and data is that achievement goals affect the determination of learning strategies mediated by perceived competence. Learning strategies which are performance predictors were proven to be influenced by perceived competence and achievement goals. Students' goals, perceived competence, and learning strategies are three important factors that influence each other in improving performance.

This study provided several contributions. By paying attention to MGO on learning strategies, teachers can provide challenging assignments, help students discover new skills, control the learning process or make decisions about it. Moreover, they help students to develop MApG, support the use of higher-order strategies, and enhance their learning. Goals are most effective when consistent or in context. PGO becomes adaptive when applied to educational contexts. The influence of MGO and PGO varies depending on the context. Therefore, future studies need to include social relations factors as independent or moderating variables.

This study had some limitations. Firstly, the data were obtained through self-report measurement at a time from several universities and grade levels, hence, there was a social desirability bias and a common method variance that can increase beta values. Furthermore, future studies need to separate the appraisers of independent and dependent variables to overcome these problems. Secondly, this study could not make a causal explanation because it only looks at one moment for the variables. Therefore, longitudinal study is needed to observe the causal relationship between the variables.

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