# Achievement Goal for Indonesian Students of Mathematics Education Program: Issues of Gender and Academic Yeal Level

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Abstract: Previous study has suggested that a consensus might exist regarding the academic year level and gender distinction in the achievement goals in higher education. The current study examines the level of the goals of achievement for students of mathematics education program in Indonesia. In addition, we analyse gender and academic year level as factors that might influence students' achievement goals. The research adheres a survey research design to probe the differences in the achievement goals for mathematics education program students. Participants involve 538 mathematics education program students. The statistical program SPSS is employed for computing correlation matrix, mean values, and standard deviations and one-way MANOVA for making comparison. Indonesian students of the mathematics education program apply other-avoidance and self-approach goals. No significant distinction was noticed between male and female pupils in all goal of achievement sub-dimensions. However, significant disparities were noted based on academic year levels, particularly in relation to self-avoidance and other-approach goals.

## 1 INTRODUCTION

Recently, complex arrangements of achievement goals have been evidenced to gauge students' goals in pursuing their academic aims. For example, (Elliot and McGregor, 2001) developed a new framework of achievement goals that involve task-, self- and other-based competences. To date, numerous studies have confirmed that goals of achievement are progressively recognized as having a important role in academic results (Lower and Turner, 2016; Mascret et al., 2017; Wynne, 2014), especially for resolving complicated problems (Maretasani et al., ). Endorsing students' task- and self-based competences rather than their other-based competence is pivotal because these competences are connected to positive learning results (Pahljina-Reinić and Kolić-Vehovec, 2017). However, prior studies have discovered that Indonesian pupils tend to utilize performance goal orientation or other-based competence and mastery-avoidance goals (Liem and Nie, 2008). In terms of gender, the differences of achievement goal levels between female and male students found in extant literature are also highly questionable (Musa et al., 2016; Rashidi and Javanmardi, 2012; Remedios et al., 2008; Wang et al., 2008; Wu,

2012). Interestingly, previous investigations have also recommended that a consensus might exist regarding the academic year difference in achievement goals (Alrakaf et al., 2014; Lieberman and Remedios, 2007; Remedios et al., 2008) although similar education levels have been studied.

To our knowledge, the level of achievement goals in higher education in Indonesia involves the latest framework suggested by Elliot et al. (2011), and analysis based on gender and academic year level has not been conducted. Accordingly, the study aims to assign the nature of the goals of achievement for a mathematics education program students in Indonesia with attention to the gap pertaining to gender and academic year level. The research questions guiding the study are as follows:

- What is the nature of the goals of achievement across a mathematics education program students in Indonesia?

- Is there any gender-based difference in achievement goals amongst mathematics education program students in Indonesia?

- Is there any difference in the achievement goals amongst mathematics education program students in Indonesia based on their academic year levels?

## 2 LITERATURE REVIEW

### 2.1 Achievement Goals

As mentioned, goals of achievement cover the aims (Ames, 1992). Ames (1992) argued that a goal of achievement contains the aims of achievement behaviour. Likewise, goal of achievement concentrates on the kinds of goal aim or reason (Ames, 1992; Maehr and Zusho, 2009; Pintrich, 1999) dictating achievement-connected behaviour. Achievement goal deciphers the idea of pupils' adaptive and maladaptive reactions to performance defiance (Dweck, 1986; Nicholls, 1984). Adaptive reactions are emphasized to promote the formation, preservation and performance of privately challenging and personally appreciated goals of performance. Maladaptive reactions are truly associated with the default to generate plausible, appreciated aims, keep potent fighting towards those aims or attain appreciated goals that are potentially within one's scope (Dweck, 1986). The main objective of achievement goal theory has been categorized into two distinct attentions, namely, mastery goal orientation and performance goal orientation (Dweck, 1986; Nicholls, 1984). Mastery goal orientation (adaptive) are reflected by defiance-seeking and great, potent persistence in the face of barriers. Students who indicate this scheme usually savor undertaking effort in the chase of problem mastery. Conversely, performance goal orientation (maladaptive) are categorized by defiance avoidance and minimal persistence in the face of adversities. Pupils with performance goal orientation are more likely to depict negative effect (like discomfort) and negative self-cognitions when facing hurdles.

(Elliot and McGregor, 2001) suggested the recent model of achievement goal, which is the $3 \times 2$ achievement goal model. The suggested model is evolved from the $2 \times 2$ mastery–performance design, distributing from the mastery–performance distinction. Under the $3 \times 2$ model, for example, mastery-approach and -avoidance goals focus on the accomplishment of task–based competence or self-based competence and incompetence, successively. By contrast, performance-approach and -avoidance goals concentrate on the accomplishment of other-based competence and incompetence, respectively. The inquiry of interest is whether task- and self-based abilities have same or distinct goal dimensions. Therefore, a $3 \times 2$ goals of achievement model (Elliot et al., 2011) is the latest model employed in the present work.

(Elliot and McGregor, 2001) asserted that task- and self-based goals have been regarded as falling under a sole construct where both have an evaluative criteria, such as mastery goal orientation. It is clearly accurately interconnected between the task-based goal of understanding new subject material and the self-based goal of broadening one's insight base. Nevertheless, (Elliot and McGregor, 2001) also depicted that task- and self-based competences are not corresponding for all conditions; moreover, dividing them into two entities is occasionally important depending on particular surroundings. Many real-world samples are connected to task- and self-based competences. Pupils who work on a crossword puzzle (i.e., task-based goal) may simply be fighting to discover all of the words in the puzzle while not caring about improving their logic capabilities (i.e., self-based goal; Elliot et al., 2011). Conversely, other-based goals are direct analogues of performance goals. Competency in mastery and performance is conceptualized as approach or evasion. Mastery goals (i.e., mastery goal orientation and performance goal orientation) are connected to positive academic outcomes; meanwhile, avoidance goals (i.e., mastery- and performance-avoidance goals) often affect negative results (Liu et al., 2017).

### 2.2 Academic Year and Gender Factor in Achievement Goals

Prior works have suggested that Indonesian students hold social-oriented performance and performance-approach orientation and mastery-avoidance goals orientation (Liem and Nie, 2008). Moreover, they are prone to follow values underlining conformity and togetherness. They also perceive safety from attaining the academic goals decided by parents or teachers. Interestingly, (Go, 2017) examined students' personal achievement goal orientation in relation to the National Exam in Indonesia. The results indicated no significant distinctions between the exam and non-exam groups in the achievement goals involving personal mastery and performance-approach goal orientations. Qualitative analysis confirms that pre-service teachers in Indonesia who enrolled at secondary science and mathematics education have diverse goals of achievement in diverse circumstances based on vital factors, including ability, course regulation, educators, subject and community (Aziz et al., 2017). For instance, they are more inclined to hold other-avoidance goal orientation in terms of the subjects, have task-avoidance goal in terms of completing high stakes coursework or taking

non-preferable courses, and indicate self-approach goals in terms of scoring greater than the classroom average value in the initial exam.

Moreover, in a comparison of students according to academic year level, several international studies have revealed differences in the achievement goals amongst higher education students. Alrakaf, Sainsbury, Rose, and Smith (2014) found that third-year students were oriented less strongly towards performance and mastery goals than their first-year counterparts. Interestingly, the research also confirmed that performance-goal-oriented students obtained higher scores in their course than their fellow students who adopted any other type of achievement goals. First-year students in psychology and nursing departments were less likely to want to dominate their courses than students in years 2, 3 and 4 (Lieberman and Remedios, 2007). The study also found that students in years 2, 3 and 4 were focused on grades and their enjoyment towards subjects substantially decreased. Similarly, Remedios, Kiseleva and Elliott (2008) indicated that Russian students' degrees of mastery were substantially lower after semesters 1 and 2. Therefore, we hypothesized that amongst mathematics education program students significant differences exist for achievement goal sub-dimensions.

Females apply masculine gender roles and males apply feminine gender roles; thus, they probably possess different goal orientations. (Remedios et al., 2008) found similar results for students in the sport field. In comparison with male students, female students indicated lower ego orientation and were less likely to declare that they engaged in an ego-oriented environment. Conversely, males were less likely to feel a task- oriented environment than the females. Meanwhile, (Wu, 2012) examined gender differences across cultures in achievement goals in Taiwan. Chi-square tests revealed that no gender distinctions were present in the pattern of achievement goals for junior high school and elementary students. Similarly, at a higher education level, no significant differences were found in achievement goals between male and female students (Wang et al., 2008). To our knowledge, however, no extant research has concentrated on the differences of achievement goal sub-constructs among students in a mathematics education program.

## 3 RESEARCH METHODOLOGY

The present study follows a survey design (Creswell, 2012). The population of the present study was a mathematics education program in Indonesia. (Fraenkel and Wallen, 2009) indicated that cluster random sampling was selected since this work selected groups rather than individuals. The research participants were 538 students of a mathematics education program in Riau Province, Indonesia. 483 (89.8%) of participants were woman participants were , whereas 55 (10.2%) of participants were man participants. Targeted participants involved those from the first until the fourth year during AY 2017– 2018. Nevertheless, this work only included the first-year participants, second-year participants and third-year participants, because the fourth-year participants were conducting their teaching training sessions. To measure goal of achievement, we employed The $3 \times 2$ Achievement Goal Questionnaire (Elliot et al., 2011). It consisted of six sub-dimensions; task-approach goal, task-avoidance goal, self-approach goal and self-avoidance goal, other-approach goal and other-avoidance goal. Cronbach's alpha score was discovered to be .95 for all the sub-constructs.

### 3.1 Data Analysis

The SPSS 24.0 software was employed in the current research for descriptive analysis. The MANOVA factorial analysis was employed to gauge the distinction in pupils' achievement goal. Cronbach's alpha coefficients are computed to assign the questionnaire reliability (total and sub- constructs). As for Hair et al., (2010), alpha scores of 0.60 to 0.70 in exploratory research are satisfactory.

## 4 RESULTS

### 4.1 Analysis of Descriptive Statistics

To present foremost insights into the data, we computed correlation matrix, mean values, and standard deviations for all measures employing SPSS (Table 1).

Table 1 provides the mean values for goals of achievement, which varied between sub-constructs (M = 4.87 and SD = 1.16 for task-approach goal; M = 5.46 and SD = 1.26 for task-avoidance goal; M = 5.57 and SD = 1.09 for self-approach goal; M = 5.20 and SD = 1.17 for self-avoidance goal; M = 5.14 for and SD = 1.29 for other-approach goal; and M = 5.58 and SD = 1.07 for other-avoidance).

Table 1: Correlation Matrix, Mean and Standard Deviation

| Variable | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| 1. Task-approach goal | 1 | .54** | .51** | .47** | 58** | .48** |
| 2. Self-approach goal | | 1 | .55** | .59** | .57** | .55** |
| 3. Task-avoidance goal | | | 1 | .59** | .52** | .56** |
| 4. Self-avoidance goal | | | | 1 | .51** | .51** |
| 5. Other-approach goal | | | | | 1 | .56** |
| 6. Other-avoidance goal | | | | | | 1 |
| Skewness | -.15 | -1.07 | -.98 | -.90 | -.60 | -1.05 |
| Kurtosis | -.07 | 1.49 | .80 | 1.24 | .09 | 1.23 |
| M | 4.87 | 5.57 | 5.46 | 5.20 | 5.14 | 5.58 |
| SD | 1.16 | 1.09 | 1.26 | 1.17 | 1.29 | 1.07 |

## 4.2 Differences in Achievement Goal Sub-constructs based on Gender

One-way MANOVA analysis was calculated to assign the distinction in the achievement goals between male and female participants. Prior to the one-way MANOVA test, the variance homogeneity test was calculated employing Levene's test of equality of error variances, which exhibited the variances of the variables scattered equally with the $F$ value = 1.47 and sig = .075 ($p > .05$). This outcome revealed that one-way MANOVA could be computed to determine the differences in the students' achievement goals. Table 2 depicts the mean and standard deviation of pupils' achievement goals based on gender.

Table 2: Mean and Standard Deviation of Students' Achievement Goals Based on Gender

| Dependent Variable | Male | Female |
|---|---|---|
| Task-approach goal | 4.94 ± 1.23 | 4.86 ± .93 |
| Self-approach goal | 5.53 ± 1.28 | 5.61 ± .94 |
| Task-avoidance goal | 5.33 ± 1.26 | 5.43 ± 1.00 |
| Self-avoidance goal | 5.22 ± 1.32 | 5.29 ± 1.03 |
| Other-approach goal | 5.03 ± 1.34 | 5.08 ± 1.07 |
| Other-avoidance goal | 5.71 ± 1.20 | 5.58 ± .90 |

Table 2 reveals that females had higher achievement goals compared with males. By contrast, males had higher other-avoidance goals (M = 5.71 and SD = 1.20) than females (M = 5.58 and SD = .90). Females had higher self-approach goals (M = 5.61 and SD = .94) than males (M = 5.53 and SD = 1.28). The lowest mean values were for the task-approach goal (males: M = 4.94 and SD = 1.23, females: M = 4.86 and SD = .93). Table 3 lists the results of the one-way MANOVA of gender in achievement goals.

Table 3 lists the findings of the one-way

Table 3: One-Way Manova Results on the Difference in Students' Achievement Goals Based on Gender

| Dependent Variable | df | Mean Square | F | Sig. | Partial Eta Squared |
|---|---|---|---|---|---|
| Task-approach goal | .333 | 1 | .333 | .354 | .552 | .001 |
| Self-approach goal | .297 | 1 | .297 | .305 | .581 | .001 |
| Task-avoidance goal | .482 | 1 | .482 | .454 | .501 | .001 |
| Self-avoidance goal | .270 | 1 | .270 | .238 | .626 | .000 |
| Other-approach goal | .140 | 1 | .140 | .114 | .735 | .000 |
| Other-avoidance goal | .816 | 1 | .816 | .923 | .337 | .002 |

MANOVA analyses on gender. Overall, no significant difference was found between male and female students' task-approach goal (F= .354, p= .552), self-approach goal (F= .305, p= .581), task-avoidance goal (F= .454, p= .501), self-avoidance goal (F= .238, p= .626), other-approach goal (F= .114, p= .735) and other-avoidance goal (F= .923, p= .337).

## 4.3 Differences in Achievement Goal Sub-constructs based on Academic Year Level

Table 4 reveals the mean and standard deviation of students' achievement goals based on academic year level.

Table 4: Mean and Standard Deviation of Students' Achievement Goals Based on Academic Year Level

| Dependent Variable | Year 1 | Year 2 | Year 3 |
|---|---|---|---|
| Task-approach goal | 4.94 ± .98 | 4.89 ± 1.02 | 4.78 ± .88 |
| Self-approach goal | 5.78 ± .87 | 5.56 ± 1.03 | 5.52 ± .99 |
| Task-avoidance goal | 5.46 ± 1.01 | 5.43 ± 1.09 | 5.39 ± .95 |
| Self-avoidance goal | 5.51 ± .97 | 5.25 ± 1.09 | 5.17 ± 1.06 |
| Other-approach goal | 5.29 ± 1.06 | 4.99 ± 1.20 | 5.02 ± .98 |
| Other-avoidance goal | 5.76 ± .82 | 5.52 ± .97 | 5.57 ± .96 |

Table 4 reveals that first-year (M = 5.78 and SD = .87) and second-year (M = 5.56 and SD = 1.03) students had the highest self-approach goals. Third-year students had the highest other-avoidance goal (M = 5.57 and SD = .96). The lowest mean value was for the task-approach goal of third-year (M = 4.78 and SD = .88), second-year (M = 4.89 and SD = 1.02), and first-year (M = 4.94 and SD = .98)

students. Overall, first-year students had higher task-approach goal, task-avoidance goal, self-approach goal, self-avoidance goal and performance goals (including other-approach goal and other-avoidance goal) than second- and third-year students. Table 5 shows the results of the one-way MANOVA of academic year in achievement goals.

Table 5: One-Way Manova Results on The Difference in Students' Achievement Goals Based on Academic Year Level

| Dependent Variable | Type-III Sum of Squares | df | Mean Square | F | Sig. | Partial Eta Squared |
|---|---|---|---|---|---|---|
| Task-approach goal | 2.142 | 2 | 1.071 | 1.140 | .321 | .004 |
| Self-approach goal | 5.944 | 2 | 2.972 | 3.078 | .051 | .011 |
| Task-avoidance goal | .441 | 2 | .221 | .207 | .813 | .001 |
| Self-avoidance goal | 9.649 | 2 | 4.825 | 4.323 | .014 | .016 |
| Other-approach goal | 8.112 | 2 | 4.056 | 3.350 | .036 | .012 |
| Other-avoidance goal | 5.042 | 2 | 2.521 | 2.871 | .057 | .011 |

Table 5 reveals the findings of the one-way MANOVA analyses of achievement goals based on academic year level. Overall, significant univariate main effects for academic year level were obtained for the percentage of self-avoidance goal [F= 4.323, (p= .014, $p < .05$)] and other-approach goal [F= 3.350, (p= .036, $p < .05$)]. To identify the difference in the students' achievement goals, the post-hoc Scheffe test was also evaluated. The analysis was conducted to examine the difference in the achievement goals based on academic year level (i.e., first-year students, second-year students and third-year students. The outputs of the post-hoc Scheffe test are indicated in Table 6.

Table 6: Post-Hoc Scheffe Test Results on The Differences in Achievement Goals Based on Academic Year Level

| Dependent Variable | Mean Difference | | | |
|---|---|---|---|---|
| | Academic Year | Year 1 | Year 2 | Year 3 |
| Self-avoidance goal | Year 1 | - | .26 | .34* |
| | Year 2 | -.26 | - | .08 |
| | Year 3 | -.34* | -.08 | - |
| Other- approach goal | Year 1 | - | .30* | .26 |
| | Year 2 | -.30* | - | -.03 |
| | Year 3 | -.26 | .03 | - |

Table 6 indicates significant difference in the level of self-avoidance goals between first- and third-year students, with mean difference of .34 $p < .05$). The mean score reveals that first-year students had higher self-avoidance goal than third-year students. Moreover, a significant difference was found in the other-approach goals of first- and second-year students, with mean difference of .30 ($p < .05$). The mean score reveals that first-year students had higher self-avoidance goal than second-year students. Findings also indicate that no significant difference existed in the task-approach, self-approach, task-avoidance and other-avoidance goals among all groups.

## 5 DISCUSSION

The study aims to assign the nature of the goals of achievement across mathematics education program students in Indonesia. Our findings reveal that the mathematics education program learners in Indonesia appreciate generally in terms of their other-avoidance goals and self-approach goals. Interestingly, learners in Indonesia report higher degrees of self-based goals and other-based goals than task-based goals. The Indonesian students of the mathematics education program tend to use other-avoidance and self-approach goals for their competency. Evasion-based goals are based on default or avoiding from this negative likelihood, whilst approach-based goals are based on success and preserving a positive likelihood. Therefore, pupils who have other-avoidance goals evade making worse than their counterparts, whilst those holding self-approach goals also focused on the attainment of self-based competence (i.e., making better than previous). Likewise, the findings of the present study appear to be corresponding with previous studies (David, 2012; Liem and Nie, 2008), which indicate that Indonesian pupils are more likely to apply social-oriented achievement and performance-approach orientation and mastery-avoidance goal orientation. This outcome can be attributed to social views, social affiliation and social agreement mediating goals of achievement (Bernardo and Ismail, 2010). The findings spotlight the interest of maintaining goals of achievement for students of the mathematics education program in Indonesia in terms of enlarging their achievements by promoting task-based goal orientation and self- based goal orientation orientation rather than other- based goal orientation.

In terms of gender comparison, analysis of one-way MANOVA indicate no significant distinctions between man and woman in goals of achievement. The findings of the current research are consistent with several previous studies (Musa et al., 2016; Rashidi and Javanmardi, 2012; Wang et al., 2008; Wu, 2012) that revealed no gender

distinctions in the pattern of achievement goals in higher education levels. Social goals cause this non- significant differences of achievement goal sub- constructs. (Bernardo and Ismail, 2010) stated that social goals constitute a contributing factor that affects the achievement goals adopted in higher education. Moreover, aside from encouraging competition based on ability and effort, the higher education system in Indonesia have also concentrated intensely on examinations to fulfil particular requirements for upcoming semesters. Hence, obtaining the best result and fulfilling the expectations of lecturers are the main contributing factors towards the same social goals between genders. This circumstance significantly influences the students' achievement goals in higher education.

The present study also confirms that a significant difference exists in achievement goals, particularly the self-avoidance and other-approach goals based on academic year level. First-year students tend to adopt higher self-avoidance goals than third-year students, and they also hold greater other-approach goals than second-year students. We may infer that first-year students often approach success by doing better that their counterparts while they define success as avoiding failure or doing worse than they have achieved before. Our findings appear to corroborate with those from previous studies (Alrakaf et al., 2014; Lieberman and Remedios, 2007; Remedios et al., 2008), which indicate that first-year students are more strongly oriented towards performance and mastery goals. One possible reason for this outcome was explained by Alrakaf, Sainsbury, Rose, and Smith (2014) as arising from the competitive secondary school milieus from which freshmen recently emerged. They contend that such environment is the main reason why first- year students adopt greater performance-approach goals compared to second- or third-year students.

# 6 CONCLUSION AND RECOMMENDATIONS

The present study shows that mathematics education program students in Indonesia hold various achievement goals, namely other-avoidance and self-approach goals. Surprisingly, no significant distinction was found between man and woman learners in all achievement goal sub-dimensions. However, significant disparities were confirmed based on academic year levels for the self-avoidance and other-approach goals. Freshmen tend to apply greater self-avoidance goals than third-year

students and have higher other-approach goals than second-year students. An important limitation of the present study involves its small sample size. As a result, we cannot compare differences in achievement goal sub-constructs between male and female students in every academic year level. Therefore, future research should explore the effect of the interaction between gender and academic year level towards goals of achievement. Further investigation of other factors, like socioeconomic background or levels of accomplishment, is also necessary.

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