

A SURVEY ON MATHEMATICS ACHIEVEMENT GOALS ORIENTATION AMONG MALAYSIAN STUDENTS: APPLICATION OF RASCH MEASUREMENT

Mohd Rustam Bin Mohd Rameli¹ and Azlina Binti Mohd Kosnin²

Motivation is a fundamental learning construct that could trigger and boost one's achievement behaviour. Achievement goals orientation is one of the motivational variables focusing on learning aims in specific learning situation. In the context of mathematics learning, the learning orientation of the students is very important to be identified especially for the teacher as many students perceived mathematics is a very tough subject. Moreover, the assessment pressure experience by the students is also the significant determinant of adopting specific achievement goals orientation in learning mathematics. Align with that, this study aims to explore the type(s) of achievement goals orientation adopt by the students in the Malaysian settings. This survey study was conducted to 976 secondary schools students which selected from three state in Malaysia. Achievement Goal Questionnaire was adapt as the instrument tool. All the collected data were analysed descriptively to identify the frequency and mean value for each types of achievement goals orientation. Findings of result showed that the goal orientation with the highest mean was mastery goal orientation and followed by performance-approach goal orientation and performance-avoidance goal orientation. This study implied that the adoption of mastery goals orientation should be retain and not let external factors such as social and exam pressure affects it.

Keywords: Achievement Goals Orientations, Mastery, Performance-Approach, Performance-Avoidance.

1. BACKGROUND OF STUDY

In the context of school setting, all kind of behaviour showed by the students whether it is positive of negative action are closely related to the elements of motivation. Elements of motivation always been use to give an explanation to the behaviour showed not only by the human but also animals (Md Yunus dan Wan Ali, 2009). Therefore, it is significant to consider the elements of motivation in the learning environment as motivation is referred to student's willingness, needs and desire to engage and achieve success in the learning process.

There are a lots of existing study conducted to identify the relationship between motivation with the students achievement in mathematics learning. The dominated results were element of motivation show positive and significant relationship with student's mathematics performance (Khoush, Bakht dan Kayye, 2005; Md Yunus dan Wan Ali; 2009; Middleton dan Spanias, 1999).. The findings could be best explain with the argument that motivation possess by a student will affect student's

¹ Universiti Teknologi Malaysia, *E-mail: mohdrustam98@gmail.com*

² Universiti Teknologi Malaysia, *E-mail: p-azlina@utm.my*

behaviour by guiding the student's intention and desire to execute related specific action (Reeve, 2005). Align with the learning context, student who has great desire to achieve the best learning performance will must put an efforts to achieve what has been targeted.

Elements of motivation are one of the important knowledge branch to be mastered not only by the students but also by the parents and teachers in school. This is essentials as the knowledge on student's motivation could encourage student's engagement in learning activities, enhance student's potential and talent and also assist teacher to create effective classroom and teaching environment which could support student's learning needs (Reeve, 2005). Elements of motivation are not only initiate one's behaviour but also strengthen it. Students who are motivated in learning process consistently show interest, high spirit, highly engaged and less depend on teacher. However, demotivated students will tend to not show interest and avoid in the learning activities. Motivation towards academic achievement lead to the action for learning and achievement such as executing a task in specific context until succeed (Masaali, 2007). Specifically, achievement motivation that focus on mastery orientation will make student to be more engage in class activities, homework and manage time effectively (Luo *et al.*, 2011). In the Malaysian educational context, there is declining of student's performance for the last previous year in terms of achievement in national examination result for Mathematics subject (MOE, 2014). This situation is not only happen to the primary school students but also to the secondary school students as the transformation of education focus shift to the higher-order thinking skills acquisition. As achievement goal orientations could be served as predictor of students' performance thus, the exploration of adoption of specific achievement goals orientation is significant.

The Learning is a dynamic process which each students will go through development phase in the aspects of knowledge, learning method, challenges etc. Therefore, motivation and self-development should go align in education process so that the elements in the development phase could be balanced. Atkinson and Rogner (1978) in their article entitled "Personality, Motivation and Achievement" stated that achievement motivation could be divided into two main motives which are motive to achieve success and motive to avoid failure. The usage of fear appeals elements by teachers in facing assessment by stating the benefits for future education and career prospectus will motivate lazy students (Putwain, 2009). According to Martin (2001), students will keep putting their efforts in learning and highly motivated when their perceived a high value to the task or activities that their need to complete. This situation clearly showed that achievement motivation adopt by the students are determine by certain factors. Based on the above mentioned statement, this study aims to explore the achievement goals orientation adopt by Malaysian students in mathematics leaning.

2. RESEARCH METHODOLOGY

This study was applied survey research design to gather information regarding students' achievement goals orientation in mathematics learning. A total of 976 secondary school students from three state and 20 schools in Malaysia were involved as the respondents of this study through cluster-stratified sampling. Besides, all the students were form four students (age = 16 years old) who are study in daily national school.

Achievement Goal Questionnaire (Elliot dan Church, 1997) was used as the measuring tools. The questionnaire consists of 13 items which measure student's achievement goals orientation in mathematics. The item from the original version of the instruments has been specify in mathematics subject in order to map the item with the research questions. Specifically, four item measure mastery goals orientation (reliability coefficient = 0.78) while four and five items. Item reliability and validity has been confirmed by applying Rasch analysis. Result found that the item reliability was high (0.99) with item separation 11.40. All the collected data was analyse by identifying the measure rank for the three achievement goal orientations. The three mean measure value was compared and ranked.

3. RESULTS

Result of analysis showed that 3 out of 4 items measuring mastery approach has negative measure value while 1 item has low positive measure value that less than 1. This imply that majority of the students adopt mastery goal orientation which focus on desire to enhance self competency. Meanwhile, 3 out 5 items measuring performance-approach has negative measure while the rest two items has measure value less than 1.0. This situation showed that students are also tend to adopt performance-approach goal orientation which focus on desire to show their competency. For performance-avoidance goal orientation, only 1 item has negative measure value. This imply that students less adopt on performance-avoidance goal orientation which focus on desire to avoid showing incompetency in learning Mathematics.

Based on the measure value for each goal orientation, performance-avoidance goal orientation has higher measure value which is 0.46 and is placed on the top of the hierarchy. Meanwhile, performance-approach and mastery goal orientation is placed on the middle and the bottom of the hierarchy with measure value -0.35 dan -0.37 . This result is supported by item distribution on item-person map where the item measuring mastery and performance-approach is distributed close to each other and close to zero.

Results of measure value for each items showed in Table 1.

TABLE 1: ITEM MEASURE ANALYSIS

<i>Achievement Goals Orientation</i>	<i>Item</i>	<i>Measure Value</i>
Mastery	It is important for me to understand the content of mathematics subject as thoroughly as possible	-1.06
	In the mathematics, I prefer material that really challenges me so I can learn new things	0.34
	My aims in mathematics learning is to enhance my mathematics skills	-0.49
	I desire to completely master the material presented in mathematics class	-0.28
	Overall Mean Measure	-0.37
Performance-Approach	My goal in mathematics class is to get a better grade than most of the students	-0.18
	I am motivated by the thought of outperforming my peers in the mathematics class	0.09
	It is important to me to do better than the other students in mathematics subject	-0.09
	It is important to me to do well compared others in mathematics subject	-0.50
	I want to do well in mathematics class to show my ability to others	0.33
Overall Mean Measure	-0.35	
Performance-Avoidance	My fear of performing poorly in mathematics class is often what motivates me	0.13
	I just want to avoid doing poorly in mathematics class	0.68
	I worry about the possibility of getting a bad grade in mathematics class	-0.10
	I am afraid that if I ask my teacher a "dumb" mathematics question, he/she might not think I am very smart	1.11
Overall Mean Measure	0.46	

4. DISCUSSION

Findings of this study was align with the previous study which were also found that students adopt more on mastery goal orientation as compared to the other two goals orientation (Diseth, 2011; Dupeyrat dan Marine, 2005; Gonida *et al.*, 2009; Lee *et al.*, 2010; Sins *et al.*, 2008; Steinmayr, Bipp dan Spinath, 2011). Study by Hamimah (2009) which conducted to the Malaysian students regarding adoption of goals orientation in science subject was also showed that students have positive perception towards the adoption on mastery and performance goals orientation while holding negative perception towards the adoption of performance-avoidance goal orientation.

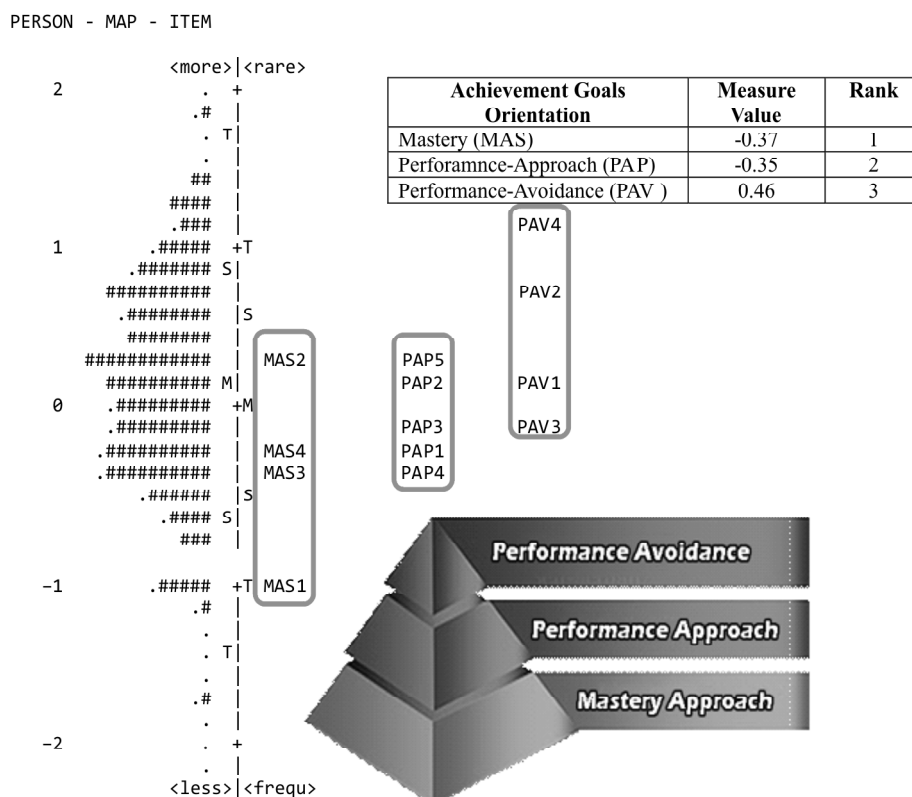


Figure 1: Item-Person Map.

The high adoption of mastery and performance-approach goals orientation imply that students are not only think of the importance to master mathematics subject to the self but also think of the needs to fulfil family hope and teacher expectation. Meaning that, students adopt mastery goal orientation as the motivational source to keep engage in mathematics learning an also to retain their interest on the subject (Senko dan Miles, 2008). This is supported by the previous study findings which showed the positive effects of the adoption of mastery goal orientation. Adoption of mastery goal orientation encourage students to spend more time in executing learning activities and willing to try difficult task (Anderman dan Wolters, 2006; Kaplan et al., 2002; Kaplan dan Maehr, 2007). The adoption of mastery goal orientation also can be related to the teaching system practice in Malaysia which emphasized the acquisition of mathematics skills. This is align with mathematics curriculum that aims to develop mathematics competency among students (KPM, 2007). Students are not only targeted o master numeracy skills but

also have to develop a good higher-order thinking skills in Mathematics (MOE, 2014). Teacher are need to ensure all the students achieve each of teaching objectives. Teachers need to play a vital role in supervise student's performance progress by always give immediate and supportive feedback to support student's learning (Hwa dan Lim, 2008). Therefore, student's learning which oriented to mastery could be enhance.

However, examination system which is still being emphasized in Malaysian education setting make the students to not spend their time and putting efforts for their interest to the mathematics subject. At the same time, the students tend to think of the standard assessment which is normative in nature that need to be achieve. This situation make the students feel motivated to get involve in the mathematics activities by having a thought to pass the normative assessment or at least doing better than their peers (Luo *et al.*, 2011). This is important for them to ensure they could further their study in the upper level. As the respondents of this study are the group of students who are compulsory to take the national examination, the adoption of performance-approach is relevant as the result of the examination will be the indicator to pursue their study in the next level.

References

- Anderman, E. M., and Wolters, C. A. (2006). Goals, values, and affect: Influences on student motivation. In P. Alexander and P. Winne (Eds.), *Handbook of Educational Psychology* (2nd ed., pp. 369–389). Mahwah, NJ: Erlbaum.
- Atkinson, J. W. and Ragner J. O. (1978). *Personality, Motivation and Achievement*. New York: Academic Press.
- Diseth, A. (2011). Self-efficacy, goal orientations and learning strategies as mediators between preceding and subsequent academic achievement. *Journal of Learning and Individual Differences*, 21, 191-195.
- Dupeyrat, C., and Marine, C. (2005). Implicit theories of intelligence, goal orientation, cognitive engagement, and achievement: A test of Dweck's model with returning to school adults. *Journal of Contemporary Educational Psychology*, 30, 43-59.
- Elliot, A. J., and Church, M. A. (1997). A hierarchical model of approach and avoidance achievement motivation. *Journal of Personality and Social Psychology*, 72(1), 218–232.
- Gonida, E. N., Voulala, K., and Kiossegiou, G. (2009). Students' Achievements Goal Orientations and Their Behavioral and Emotional Engagement: Co-Examining The Role of Perceived School Goal Structures And Parents Goals During Adolescence. *Learning and Individual Differences*, 19, 53-60.
- Hamimah A. N. (2009). *Impak Sekitaran Sekolah, Motivasi dan Strategi Pembelajaran terhadap Pencapaian Akademik dalam Matapelajaran Sains*. Doktor Falsafah. Universiti Teknologi Malaysia: Skudai.
- Hwa, T. Y., and Lim, C. S. (2008). Implementing school based assessment: The mathematical thinking assessment (MATA) framework. *Buku Koleksi Bahan Seminar Inovasi Pedagogi IPBL*, 25, 73-88.

- Kaplan, A., and Maehr, M. L. (2007). The contribution and prospects of goal orientation theory. *Educational Psychology Review*, 19, 141–184.
- Kaplan, A., Middleton, M. J., Urdan, T., and Midgley, C. (2002). Achievement goals and goal structures. In C. Midgley (Ed.), *Goals, goal structures, and patterns of adaptive learning* (pp. 21–53). Mahwah, NJ: Lawrence Erlbaum.
- Kementerian Pelajaran Malaysia (2007). *Kurikulum Bersepadu Sekolah Menengah, Matematik Moden Tingkatan 4*. Pusat Pembangunan Kurikulum: Kementerian Pelajaran Malaysia.
- Khoush Bakht, F., and Kayyer, M. (2005). A survey on motivational model of math learning in elementary students. *Journal of Psychology*, 9(1), 67-81.
- Lee, J. Q., Mc Inerney, D. M., Liem, G. A. D., and Ortiga, Y. P., (2010). The Relationship Between Future Goals And Achievements Goal Orientations: An Intrinsic-Extrinsic Motivation Perspective. *Contemporary Educational Psychology*, 35, 264-279.
- Luo, W., Hogan, D., and Paris, S. G. (2011). Predicting Singapore students' achievement goals in their English study: Self-construal and classroom goal structure. *Learning and Individual Differences*, 21, 526-535.
- Martin, A. J. (2001). The student motivation scale: A tool for measuring and enhancing motivation. *Australian Journal of guidance and Counselling*, 11, 1–20.
- Masaali, S. (2007). *Relationship between reading study and academic achievement among students in IUJ*. Isfahan: Khorasgan Slamic. Azad University, Persian: Disseration.
- Md. Yunus, A. S., Wan Ali, W. Z., (2009). *Motivation in the Learning of Mathematics*. *European Journal of Social Sciences*, 7(4), 93-101.
- Middleton, James A., and Spanias, Photini A. (1999). Motivation for achievement in mathematics: Findings, generalizations, and criticisms of the research. *Journal for Research in Mathematics Education*, 30(1), 65-88.
- Ministry of Education (2007). *Integrated Curriculum for Secondary School, Modern Mathematics Form 4*. Curriculum Development Centre.
- Putwain, D. W., and Roberts, C. M. (2009). The development and validation of the teachers use of fear appeals questionnaire. *British Journal of Educational Psychology*, 79, 643–661.
- Reeve, J. (2005). *Understandings Motivation and Emotion* (4th Edition). USA: John Wiley and Sons, Inc.
- Ryan, R. M., and Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development and well-being. *American Psychologist*, 55, 68–78.
- Senko, C., and Miles, K. M. (2008). Pursuing Their Own Learning Agenda: How Mastery oriented Students Jeopardize Their Class Performances. *Contemporary Educational Psychology*, 33, 561-583.
- Sins, P. H. M., Joolingen, W. R. V., Savelsbergh, E. R., and Hout-Wolters, B. V. (2008). Motivation and performance within a collaborative computer-based modelling task: relation between students' achievementgoal orientation, self-efficacy, cognitive processing and achievement. *Journal of Contemporary Educational Psychology*, 33, 58-77.
- Steinmayr, R., Bipp, T., and Spinath, B. (2011). Goal orientations predict academic performance beyond intelligence and personality. *Journal of Learning and individual Differences*, 21, 196-200.