
Self-Worth Related Competences of Low and Average Mathematics Achievers

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Abstract

The quality of the students of a national mathematics education is termed as a student with 'mathematical thinking'. Among others, this quality is to meet the needs of the 21st century based on attitudes and values. The values in question are mathematical values and universal values which include elements such as confidence, competence and perseverance, in addition to specifically mentioning responsible values as the goal of mathematics education in the national secondary school curriculum. These values are part of the competence for social and emotional learning (SEL), which is referred to as social and emotional competence (SEC). Emotional intelligence influences social skills, thus can be seen from the perspective of relationships with oneself or self-worth and the perspective of relationships with others. This study aims to examine the level of competencies related to students' self-worth, namely self-management competencies and personal responsibility competencies for low and middle achieving students in secondary school mathematics. This study uses a questionnaire instrument based on the perspectives of the mathematics teacher and the students themselves. The instrument allows mean scores to be obtained on a scale of agreement, 1 to 7. The study involved a total of 46 respondents of mathematics teachers, and 242 respondents of low- and middle-achieving students from poor-urban and low socioeconomic backgrounds. Findings show that both students' self-management competencies and students' personal responsibility competencies are at a moderate level and close to low level. On average, the perceptions of teachers and students involving these two competencies show differences up to close to 1 scale. This indicates that there is a gap that requires an intervention to improve the mastery of competencies related to students' self-worth which is also related to emotional intelligence in particular, and student SEC in general through SEL in mathematics learning.

Keywords : Emotional Competencies, Social Competencies, Mathematics Learning

INTRODUCTION

CASEL [1] raises five values as competencies in social and emotional learning (SEL). CASEL sees the importance and impact of SEL as measured by the following values or competencies, namely self-awareness, social awareness, self-management, communication skills, and responsibility in decision making. Devereux Student Strengths Assessment, DESSA [2] added three more values, namely goal-oriented attitude, personal responsibility, and optimistic thinking.

McClelland Center for Research and Innovation Hay Group [3] which published the Emotional and Social Competency Inventory (ESCI), produce four values of emotional intelligence, by placing the relationship of the four values of emotional intelligence with the perspective of 'self' and 'others'. In the context of self-worth, in addition to self-awareness competencies, the important competencies in social and emotional

learning (SEL) are self-management competencies and personal responsibility competencies.

LITERATURE REVIEW

Self-management competencies enable students to handle daily stress and control their emotions under difficult circumstances [4]. This competency is a meta-cognitive skill, which is a skill that is able to manage one's emotions and manage self-learning [5]. The ability of students to control their own emotions impacts the student memory and the cognitive resources they need to use on academic assignments [6].

Self-management skills include the ability to monitor and reflect on personal and academic goal setting. Self-control from the academic aspect has important implications for student motivation in the classroom as well as learning strategies [7]. These skills are also core skills that students need to master where failure to master these skills also invites the risk of mental health problems, internal and external

disorders, behavioral problems, and low academic achievement [5], [8].

Among the Social and Emotional Learning (SEL) skills related to self-management competencies are as follows [2], [4], [9]–[15]:

- 1. Set a plan and work towards achieving goals.**
- 2. Overcome obstacles and create strategies for long-term goals.**
- 3. Monitor achievement for personal and academic purposes in the short and long term.**
- 4. Control emotions for aggressive behaviors, impulses, and self-destructive behaviors.**
- 5. Manage personal stress and interpersonal stress.**
- 6. Controlling attention (maintaining optimal work performance).**
- 7. Use feedback constructively.**
- 8. Demonstrate positive motivation, hope and optimism.**
- 9. Get help when needed.**
- 10. Demonstrates perseverance, determination, and perseverance.**
- 11. Advocate for yourself.**

Personal responsibility competencies, on the other hand, allow students to tend to be more careful or more meticulous, and can be expected for themselves and for the group they join. OECD [13] places this competency as part of the domain of 'conscientiousness'.

Among the sub-domain skills in addition to responsible skills are achievement-oriented skills (goal-oriented attitudes), self-control skills, and perseverance skills. The study of Bogg and Roberts [16] shows that personal responsibility competencies have a high negative correlation with drug abuse, suicide, and violent activity.

Among the PSE skills related to personal responsibility competencies are as follows [13], [17], [18]:

- 1. Manage personal belongings well.**
- 2. Provide requirements for daily schooling.**
- 3. Perform daily tasks or routines without the need for warnings.**
- 4. Pay attention to important information.**
- 5. Perform tasks on time.**
- 6. Demonstrates meticulousness and neatness in performing tasks.**
- 7. Acts as a leader in peers.**
- 8. Plays an important role at home or at school.**
- 9. According to the set rules.**
- 10. Encourage a positive attitude towards others.**

From the general perspective of the impact of SEL in school practice, the first large-scale meta-analysis study conducted by Durlak, Weissberg, Dymnicki,

Taylor and Schellinger [10] on 213 types of SEL intervention programs that are universal and school-based, and involved 270,034 students from preschool to high school level becomes very significant. Among the research questions focused on are such as 'What are the outcomes to be achieved through interventions that lead to the development of students' social and emotional skills?' and 'Do SEL interventions promote positive outcomes and prevent future problems?'

The findings of their study showed that SEL had a significant impact on social and emotional skills, attitudes, behaviors, and academic achievement of up to 11% compared to students who did not follow SEL. This can be supported by another cost-benefit analysis study of the SEL program by the University of Colombia which shows that the average return on investment (ROI) for the SEL program is \$11 to \$1 invested [19]–[22].

This study also supports previous findings by Schonert-Reichl and Hymel [23] who asserted a positive and significant relationship between SEL intervention programs and school success. The definition of 'school success' is broad and includes 'school attitude' such as school motivation and responsibility, 'school action' such as school attendance issues, issues related to student discipline, as well as 'school achievement' involving grades, examination and academic achievement.

Meanwhile, in the context of the curriculum in Malaysia, the goal of primary and secondary school mathematics education in Malaysia is to produce students who have quality "... who are able to do mathematics and understand mathematical ideas and apply mathematically, knowledge and skills in daily life based on attitudes and values." [24]. This quality is referred to as the term 'mathematical thought'.

In addition, mathematical thought also aim for students who are critical, creative and innovative and meet the needs of the 21st century. The core of competitive student that ready for the 21st century is emphasized to be based on attitudes and values. This statement is a commitment to school mathematics educators in Malaysia based on the Primary and Secondary School Standard Curriculum, KSSR and KSSM.

Thus, this study can show the need for social and emotional learning (SEL), especially in focusing on self-worth related competencies. Moreover, this study could act as supporting data in promoting the short-term effects of the quality students as mentioned by Weissberg [22]; Durlak, Weissberg, & Pachan, [25]; Farrington et al., [26]; and The Center for Health and Health Care in Schools, [27] that students will have a positive

attitude towards themselves, others, and the tasks assigned to them, including improving self-efficacy, self-confidence, empathy, commitment and better relationships with school, as well as a sense of purpose. Pupils will show more positive social attitudes and connect with peers and adults when mastering social and emotional skills.

The effects of SEL have also been reported to reduce problem behaviors and reduce high-risk attitudes as well as reduce emotional stress among students [28]–[30]. The effects of SEL also will enhance academic achievement, and increase student attendance to school [10], [31].

Furthermore, self-efficacy and self-confidence are closely related to improved mathematical achievement [32], [33]. Therefore, in this study, researchers intend to examine the level of self-management competencies and personal responsibilities competencies for low and middle achieving students in high school mathematics.

RESEARCH METHODOLOGY

This study uses a questionnaire instrument developed based on literacy studies of CASEL [34], DESSA [2], ESCI [3], and OECD [35], as well as adaptations from DESSA [2], [18] study instruments. This instrument was developed to obtain information on the level of mastery of social and emotional competence among secondary school students based on the perspective of mathematics teachers and students themselves.

The social and emotional competencies (SEC) measured in this study include various social and emotional competencies including self-awareness competencies, self-management and students' personal responsibility competencies.

The results of this questionnaire will give meaning to the extent of SEC in the perspective of students and teachers, in turn can provide a perspective on the gap between the aspirations of KSSM mathematics curriculum with the implementation of curriculum in the classroom to achieve curriculum aspirations and national education policy.

Study respondents were required to state their level of agreement based on the seven-point likert scale as shown in table 1 below:

Table 1: Level of agreement for the 7-point Likert scale

| Likert Scale | Agreement |
|--------------|-------------------|
| 7 | Strongly Agree |
| 6 | Agree |
| 5 | Somewhat Agree |
| 4 | Simple Agree |
| 3 | Somewhat Disagree |
| 2 | Disagree |
| 1 | Strongly Disagree |

To analyze and determine the level of need, the average mean score is divided into three parts, namely high social and emotional competencies, SEC level, medium SEC level, and low SEC level. Levels are in the scale of 1.00 - 3.99, which indicates the low SEC level, while agreement on scale 4.00 - 5.99 is considered moderate SEC level, and agreement on scale 6.00 - 7.00 is considered high SEC level. The details are illustrated in the figure below:

Figure 1: Agreement Scale

| Strongly Disagree | Disagree | Somewhat Disagree | Simple Agree | Somewhat Agree | Agree | Strongly Agree |
|---|----------|-------------------|--|----------------|--|----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Students have low levels of social and emotional competence | | | Students have moderate levels of social and emotional competence | | Students have high levels of social and emotional competence | |

Data were analyzed using Statistical Package for Social Science (SPSS) version 25 software to obtain mean scores and standard deviations. The mean score and standard deviation from the data analyzed aims to provide a comparison of two perspectives on the SEC level of low and middle achieving students in the subject of Mathematics, namely from the teacher's perception and from the student's own perception.

In this study, a total of 46 respondents of mathematics teachers, while a total of 242 respondents of form 4 (16 year olds) students were involved in answering this questionnaire. Student respondents were selected by targeted sampling aimed at regular day secondary schools, which met the characteristics of low- and middle-achieving students in mathematical literacy. In addition, student respondents are also from school areas in the Klang valley where the average respondents are in

the urban-poor and socio-economic low categories. Respondents of mathematics teachers were randomly sampled, including mathematics teachers who taught in sample student schools. Confidence level is 95% with confidence interval is +/- 6.3.

RESULT AND DISCUSSION

The result of the level of agreement for students' personal responsibility competences is shown in the table 2 and level of student self-management competences is shown in table 3 below:

Table 2: Level of personal responsibility competences

| No | Item | Students | | Teachers | | Competency Level |
|--------------------------------|--|-------------|--------------|-------------|--------------|------------------|
| | | Mean | SD | Mean | SD | |
| 1 | Take good care of personal items | 5.64 | 1.437 | 4.46 | 1.277 | Moderate |
| 2 | Ready for daily schooling | 5.36 | 1.449 | 4.22 | 1.365 | Moderate |
| 3 | Perform tasks without the need for reminder | 4.86 | 1.256 | 3.67 | 1.399 | Low |
| 4 | Work within the allotted time | 4.91 | 1.239 | 3.76 | 1.479 | Low |
| 5 | Demonstrate meticulousness in carrying out assignments | 5.12 | 1.228 | 3.78 | 1.381 | Low |
| 6 | Demonstrate a trustworthy attitude to contribute in group work | 5.32 | 1.257 | 4.35 | 1.353 | Moderate |
| AVERAGE AGREEMENT SCORE | | 5.20 | 1.311 | 4.04 | 1.376 | Moderate |

Table 3: Level of student self-management competences

| No | Item | Students | | Teachers | | Competency Level |
|--------------------------------|---|-------------|--------------|--------------|--------------|------------------|
| | | Mean | SD | Mean | SD | |
| 1 | Pay attention | - | - | 4.46 | 1.026 | Moderate |
| 2 | Focus on the task despite any distractions | 4.55 | 1.491 | 3.85 | 1.316 | Low |
| 3 | Able to adapt to new situations | - | - | 4.09 | 1.170 | Moderate |
| 4 | Able to control emotions and attitudes to complete challenging tasks | 4.68 | 1.415 | 3.91 | 1.244 | Low |
| 5 | Accept the second or third option when the first option is not available. | 4.98 | 1.323 | 4.30 | 1.030 | Moderate |
| 6 | Able to perform tasks in an orderly manner. | 4.69 | 1.291 | 4.11 | 1.233 | Moderate |
| 7 | Still feel calm despite being challenged | - | - | 3.89 | 1.251 | Low |
| 8 | Think before you act | 5.20 | 1.396 | 3.93 | 1.218 | Low |
| AVERAGE AGREEMENT SCORE | | 5.20 | 4.725 | 1.380 | 4.068 | 1.186 |

In table 2, both teacher and student respondents reported a moderate level of student responsibility competency. Students reported an average mean score of 5.20 (SP = 1.311), while teachers reported an average mean score of 4.04 (SP = 1.376).

Three items showed differences in perceptions between teachers and students, in which teachers placed low levels of competence, while students placed moderate levels of competence. Teacher respondents placed items 'doing tasks without being reminded' (Mean = 3.67, SP = 1.399), 'working within the allotted time' (Mean = 3.76, SP = 1.479), and items 'demonstrate meticulousness in performing tasks' (Mean = 3.78, SP = 1.381). However, the mean difference in the average perception of teachers and students is 1.16. These findings indicate that in general, the personal responsibility competencies of low- and middle-achieving students in mathematics are at a moderate

level, however it approaching low levels (Mean = 4.04, SP = 1.376). Specifically, the three values of personal responsibility items reported as low and weak need to be addressed.

In table 3, on average, the level of student self-management competence is very moderate, with the mean value of the average agreement score of 4.068 (SP = 1.186). The lowest mean score value is related to 'focus on tasks despite distractions' with a mean score value of 3.85 (SP = 1.316).

The mean score value was also low on the item 'still feel calm despite being challenged' (Mean = 3.89, SP = 1.251). In the item 'think before acting', students put a mean value of 5.20 (SP = 1.396) which is a good level of competence, while teachers consider this level of competence low with a mean score value of 3.93 (SP = 1.186). Teachers also assessed that the level of competence 'able to control emotions to complete challenging tasks' at a low

level (Min = 3.91, SP = 1.244), which students do not feel that way (Min = 4.68, SP = 1.415). The data also shows that mean difference between students and teachers' perceptions is 0.66.

Self-worth related competencies are important as a defensive wall for students in recognizing and recognizing their own abilities and limitations including their own emotions [36]. This is supported by Ferguson [8] and Shanker [5] who explain the risks of mental health, internal and external disorders, and other learning difficulties that ultimately make the need for self-management competencies as relevant and important for students to handle daily challenges that ultimately act in controlling emotions even in difficult situations. In the context of learning mathematics, these skills have important implications to continue to motivate students in using appropriate learning strategies.

IMPLICATION AND CONCLUSION

In this study, the data clearly shows that self-management competencies and personal responsibilities for low- and middle-achieving students in secondary school mathematics are at a moderate level, and even close to low level. For the level of personal responsibility competency, the mean score reported by teachers is 4.04, which is only 0.05 which distinguishes between moderate and low level. As for the level of self-management competency, the mean score reported by teachers is 4.07, which is only 0.08 which distinguishes between moderate and low level.

As for self-management competencies, teachers reported that students are not able to focus on assignments when there are disruptions. The emotional effects of students are disturbed when they are unable to control emotions when faced with challenging tasks and when they are being challenged, which ultimately makes students act emotionally without thinking carefully.

Teachers also reported that students should always be reminded to perform a given task, and not be able to be responsible in working at the appointed time, and not even showing meticulousness while carrying out assignments. This shows a lack of responsible values in problem solving and decision making, and values of confidence and perseverance in learning mathematics. The mean scores for these three elements in this personal responsibility competency were around 3.67 to 3.78, although students themselves reported between 4.86 to 5.12. It shows the discrepancy between the perceptions of teachers and the students in terms of self-worth competences.

From the results of this study, we can conclude that the level of SEC in the perspective of students and teachers for these two self-elements is at a moderate level and approaching a low level. In addition, the average mean gap of perception between teachers and students in these two self-

worths competency elements is also between 0.66 to 1.16, or on average is 0.91, which is close to 1 scale.

This shows that, in the context of mastery of students' social and emotional skills, there is clearly a gap between the aspirations of the mathematics curriculum at the secondary school level and the implementation of the curriculum in the classroom to achieve the aspirations of the curriculum and national education policy, which clearly stated must be based on attitudes and values.

According to the national mathematics curriculum, the values in question are mathematical values and universal values, whose values should include elements such as confidence, competence and perseverance [37]. In fact, the value of responsibility is also one of the main values in the National Education Philosophy apart from being the main statement of KSSM mathematics education goals. These findings also indicate that there is a need to increase the self-worths of students through SEL in mathematics learning.

However, this data has certain limitations as the respondents involved in this study are from the group of students who are in the category of urban-poor, low socio-economic level and are in the Klang Valley area only. Further research that can be explored is to look at the level of self-management competencies and personal responsibilities among rural students and comparison with urban area students.

Levels of elements in social and emotional competence may also differ between the two groups of students. Moreover, this study only looks at the needs of low-achieving students in mathematics. Thus, future studies can add other socioeconomic factors to understand the effects in different backgrounds. It will open up different paradigms in social and emotional learning approaches especially in mathematics education.

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