Motivational Orientations of Students with Learning Disabilities in Mathematics[1]

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Abstract
A significant number of students with learning disabilities encounter challenges in acquiring knowledge, particularly in mathematics. Nonetheless, having a disability or being disadvantaged is not a preference or decision made by these students - or more generally, by these individuals; rather, this label is assigned to them by the prevailing ideal society that creates normative classifications for identities. Students with disabilities can attend regular education institutions alongside their non-disabled peers through an inclusive education system. However, providing identical opportunities does not necessarily ensure that these students will achieve the same outcomes as their non-disabled counterparts in the educational process. Moreover, motivational orientation is a crucial factor in the success of students participating in inclusive education. Teachers' instructional methods, students' intrinsic motivation, and interactions with family or the environment can contribute to a lack of motivation among students in inclusive education settings. Therefore, the aim of this study is to examine the motivational orientations within mathematics courses of middle school students participating in inclusive education. The study follows a phenomenological research design, which is a qualitative approach. The research involves two twin seventh-grade students, their father, and their current mathematics teacher. Data is collected using a semi-structured interview protocol based on the Motivated Strategies for Learning Questionnaire (MSLQ). The findings indicate that the students, teacher, and father all agreed on the orientations of intrinsic goals, self-efficacy, and test anxiety. According to the results, students in inclusive education do not have intrinsic goals related to the mathematics course; instead, their extrinsic goals are focused on grades and self-realization. Additionally, students in inclusive education do not experience test anxiety, although they sometimes feel tired before exams. In conclusion, students in inclusive education do not exhibit lower levels of motivation, and each student in inclusive education is unique. Treating them as identical and attempting to find a generalized solution may not yield effective results.

Keywords: Motivation, Students with Learning Disabilities, Goals, Values, Test Anxiety, Self-Efficacy

Introduction

Many of the students with (learning) disabilities have difficulties in learning, especially, mathematics (Allsopp, et al., 2003; Shin, et al., 2017). It can be stated that one of the key factors in achieving success in mathematics courses for students undergoing inclusive education (IE) is their motivational orientations (Kistnasamy, 2014). The motivational orientations of students with special educational needs (SEN) who are part of IE differ from those of their peers. While their non-disabled peers generally have high levels of intrinsic motivation, students with SEN typically exhibit higher levels of extrinsic motivation (Buzdar et al., 2017; Madden & Slavin, 1983). In other words, the success of students in IE is significantly influenced by their teacher's instructional style and their family's attitude. This suggests that if students in IE have low motivation, it is not directly related to their disabilities (Causton-Theoharis et al., 2011; Kırcaali-İftar & Batu, 2007).

1 A part of the data of this study was used in an oral presentation at EDUCONGRESS 2022.

Students with SEN reported higher academic self-concepts and enjoyment of learning compared to those in regular pears. This suggests that extrinsic factors, like social support, play a significant role in their motivation (Kocaj et al., 2018). Students with special educational needs typically exhibit higher levels of extrinsic motivation compared to their non-disabled peers, often due to their reliance on external incentives and support from educators and social environments (Buzdar et al., 2017). Additionally, research suggests that students' motivational orientations, including their achievement goal orientations and self-efficacy, are significantly related to their success in mathematics. Students who adopt mastery goal orientations and perceive their classroom environments positively tend to use effective learning strategies and achieve higher academic outcomes (Wolters, 2004). The perception of a supportive classroom environment, including teacher expectations and the use of reform practices, positively influences students' motivational orientations & mathematics achievement. This effect is particularly pronounced for students with lower self-efficacy in mathematics (Gilbert et al., 2014).

Based on these explanations, considering that students with learning disabilities and those in IE do not all possess the same characteristics and qualities, determining their motivational orientations is crucial for preparing the learning-teaching process and environment to provide them with the quality education they need. In this context, the guiding research question for the study is: 'What are the motivational orientations of middle school students in IE education with regard to mathematics courses?'.

Review of Literature

Several studies have demonstrated the significant role of motivation in the academic behaviour and achievement of students with learning disabilities (LD). Motivational orientations and characteristics can predict subsequent student engagement and performance in academic tasks (Sideridis & Scanlon, 2006). This section presents a review of the literature on studies that examined how motivation operates in the population of students with learning problems/ disabilities. These studies stem from different theoretical perspectives on motivation:

Attribution theory, developed by Weiner (1985), provides a comprehensive framework for understanding the causal attributions for success and failure. The theory primarily addresses the question: 'Why did I succeed or fail?' (Weiner, 1979). In a meta-analysis, Mamlin et al. (2001) reported that in 19 out of the 22 studies reviewed between 1980 and 1996, students with learning disabilities (LD) had significantly elevated scores on external locus of control compared to typical groups, with most studies conducted with elementary school students. This literature review compellingly indicates that students with LD tend to attribute their success to luck and their failure to a lack of ability. Causal attributions and an external locus of control are strongly related to helplessness.

Learned helplessness is defined as the inability to learn when an individual perceives no relationship between their behaviour and reinforcement (Overmier & Seligman, 1967). It also involves the expectation that responses will be ineffective, which reduces the incentive to initiate instrumental responses and disrupts subsequent learning of response-reinforcement contingencies (Klein, et al., 1976). Wilgosh (1984) systematically examined learned helplessness in elementary school girls with and without learning disabilities (LD). The study involved a failure task with two solvable and six unsolvable puzzles, where students had to trace all lines without lifting their pencil. Results indicated that girls with LD gave up significantly earlier than those without LD, as shown by the overall amount of time spent on the puzzles. Despite spending less time overall, the girls with LD attempted more puzzles than their non-LD peers, indicating they spent less time on each puzzle. Similarly, Butkowsky and Willows (1980) examined differences between elementary students with and without LD in perceptions and attributions related to learned helplessness following success and failure conditions. Results indicated that students with low reading ability had lower expectations for success, persisted significantly less compared to typical students, and attributed their failure to stable factors such as a lack of ability.

Self-determination theory was influenced by the motivational dichotomy of intrinsic versus extrinsic motivation, as well as the achievement

motive, incorporating basic psychological needs such as autonomy, competence, and relatedness (Ryan & Deci, 2000). There have been relatively few studies applying SDT to students with learning disabilities (LD). Most SDT-based research on LD has focused on the construct of self-reported self-determination, particularly during students' transition to adolescence. Consequently, how SDT and its broader range of constructs predict the behavior of individuals with LD remains an open question and a potential direction for future research (Sideridis, 2009).

Self-efficacy is defined as an individual's belief in their capability to perform a skill (Bandura, 1977). Regarding perceptions of self-efficacy, Klassen (2002) conducted a meta-analysis of comparative and intervention studies involving students with and without learning disabilities (LD). The results indicated that, with some exceptions (e.g., Tabassam & Grainger, 2002), students with LD did not have lower self-efficacy beliefs compared to their typical peers. Alvarez and Adelman (1986) reported that 30% of elementary students with LD exhibited inflated perceptions of efficacy. They attributed this finding to a self-protection mechanism, whereby students with LD attempt to conceal their difficulties from others.

Achievement goal theory incorporates constructs from various theoretical frameworks, such as the 'achievement motive' tradition (McClelland et al., 1953), helplessness theory (Miller & Seligman, 1975), and attribution theory (Weiner, 1979). In the dual motive form (Dweck & Leggett, 1988), two goal orientations are described: (i) performance goals, which have an extrinsic focus where reinforcement comes from outperforming others, and (ii) mastery goals, which have an intrinsic focus where reinforcement comes from within, such as intrinsic motivation, and where individuals engage in an activity out of interest and enjoyment. The application of achievement goal theory in learning disabilities has yielded inconclusive results. For instance, Fulk et al. (1998) reported no differences between students with and without learning disabilities (LD) regarding mastery and performance goals, with differences only observed in task avoidance goals, favoring the LD group. Similar findings regarding task avoidance goals were reported by Bouffard and Couture (2003). Conversely, other studies have reported significant between-group differences. For example, Carlson et al. (2002) and Sideridis (2005) found significantly lower levels of mastery goals and significantly higher levels of performance goals in elementary students with LD compared to their typical peers across four measures of goals.

As a summary of literature review; It is apparent that motivation plays a significant role in the academic experience of students with LD. In most studies, motivational constructs play a salient role in learning disabilities and at times are more significant determinants of academic achievement. Thus, it is important to work on how to incorporate this knowledge base into instructional programs in order to enhance the academic achievement of students with LD. (Sideridis, 2009).

Methodology

Uncovering the motivational orientations of students with learning disabilities through the completion of pre-prepared scales or information forms is challenging due to both the significant individual differences among these students and their low cognitive skills required to complete the scales (Johnstone et al., 2006). Therefore, the design of this study is determined to be phenomenological, a type of qualitative research. The aim of phenomenological research is to explore the meaning of a phenomenon by examining the lived experiences of individuals who have encountered it (Creswell, 2007; Lincoln, 2005).

Participants

The participants in the study were selected using purposive sampling (Fraenkel et al., 2012). Given that students, teachers, and families are considered the three main pillars of educational activities, the study included two seventh-grade twin siblings (Uygur and Ural - pseudonyms) who are subjected to IE - one diagnosed with highly intellectual disability (Ural) and the other with moderate intellectual disability (Uygur) - their mathematics teacher (Serhat), and their father (as participants).

Data Collection Tool

The semi-structured interview protocol used as a data collection tool was developed by adapting questions from the Motivated Strategies for Learning Questionnaire (MSLQ) by Pintrich et al. (1991). The protocol consists of three sections: personal information, questions about learning strategies, and questions about motivation. The data presented in this study are derived solely from the responses to the questions in the motivation section. These questions pertain to sub-dimensions such as intrinsic and extrinsic goal orientations, task value, learning beliefs, self-efficacy, and test anxiety. The semi-structured interviews conducted with the participants were audio-recorded and then transcribed into written form.

Results

The findings from the study are categorized under the main headings of the Value component, the Expectancy component, and the Affective component, in alignment with the questions in the protocol and as structured in the MSLQ.

Value Component

Both the students themselves, as well as their teacher and parent, indicated that the students do not possess intrinsic goal orientations within the Value component. A sample dialog that took place during the interviews is as follows:

Researcher: Youths, do you have any goals for mathematics class? Like I can do or will do?

Uygur: I don't have, teacher (they perceive the researcher as a teacher).

Ural: I don't have, too.

Regarding the extrinsic goal orientations, another sub-dimension of the Value component, the students reported being motivated by the goal of achieving good grades, while their mathematics teacher noted that in addition to grades, the students are also motivated by the goal of proving themselves. Their father stated that the goal of obtaining a good profession motivates his children. In the task value sub-dimension of the Value component, there is a discrepancy between the views of the teacher and parent and those of the students. The students claimed to place great value on mathematics and the tasks and topics given in math class, whereas their teacher and father indicated that the students place low value on the math class.

Expectancy Component

There are also differences among participants regarding the control of learning beliefs within the Expectancy component. The students mentioned that if they succeed, it is due to the ease of the exam questions, while they attributed their failures to their own laziness. In other words, they linked their success to an external factor beyond their control, whereas they attributed their failures to an internal cause. Sample dialogues is as follows:

Interviewer: When you get high score on math exam, what is reason of this solution?

Uygur: Because of being easy.

…

Interviewer: What is the reason for getting high score, Ural?

Ural: Because of the fact that Serhat teacher conduct an easy exam.

…

Interviewer: What is the reason for getting low scores on math exam for you?

Ural and Uygur: Because we don't study.

Ural: When I get low grade, I become upset.

Their father, on the other hand, stated that the sole factors affecting their success or failure are the attitudes of the teacher and the children, emphasizing that neither he nor their mother is responsible. In other words, according to the father, the factors influencing the children's success and failure are beyond his control. The mathematics teacher mentioned that the primary reason for these students' failures is their disabilities and their participation in IE, whereas their successes are attributed to the ease of the exams. In other words, the mathematics teacher's perspective suggests that the students' success is contingent upon external conditions being favourable, implying that the students cannot achieve success on their own. Regarding the other sub-dimension of the Expectancy component, self-efficacy, there is an inconsistency among the students themselves. One of the twins expressed confidence in their ability to succeed in mathematics, while the other was certain they could not. Both the mathematics teacher and

the father shared the same views as the students. A particular point emphasized by the parent and teacher regarding self-efficacy is that, although the participant students express confidence and hope in their abilities, they do not translate this into action.

Affective Component

The final component of the findings, the Affective component, contains only one sub-dimension: test anxiety. The common view among the students, parent, and teacher is that the students do not experience any test anxiety.

Interviewer: How do you feel during exams?

Uygur: Good, teacher.

Interviewer: Are you relax? Or tired? Do you fear?

Uygur: Sometimes I was tired.

Interviewer: Why sometimes you are tired?

Uygur: If there is a question I didn't understand, I am thinking.

Interviewer: How do you feel during exams, Ural?

Ural: Teacher, I am praying.

Interviewer: Why you are praying?

Ural: To get high score.

Discussion

The findings of the study align with certain points in the relevant literature, while in other aspects, they yield different results.

According to Bouffard and Couture (2003), task avoidance goals are favourable for the LD group. However, the present study finds that approach goals are more prevalent among participant students. The task value results indicate that students place a high value on mathematics, in contrast to the perceptions of their teacher and father. This discrepancy aligns with Wigfield et al. (2009), who assert that values are subjective and vary among individuals. While some students find math achievement valuable, others do not; thus, different perspectives are expected and not necessarily problematic. Nevertheless, the generalization of students' low value towards school and courses presents an issue. This discrepancy may arise because the teacher and father have not explicitly inquired about the students' value levels, potentially leading to personal judgments. It is crucial to understand the reasons why students value mathematics, which, according to the interviews, include the teachers' attitudes and the perceived importance of math in daily life.

Mamlin et al. (2001) reported that students with learning disabilities (LD) predominantly exhibit an external locus of control, meaning they tend to attribute their success to luck and their failure to a lack of ability. The participant students in this study reflected similar tendencies; they attributed success to external factors and failure to themselves. However, their teacher and father did not entirely blame the children. Both the father and the teacher discussed deficiencies and a lack of interest and education as contributing factors.

Wilgosh (1984) found that students with (LD) tend to give up on tasks early due to past negative experiences, which can lead to learned helplessness. One of the participants in this study exemplified this by generally not attempting to solve any questions and instead marking answers randomly. When asked why he did not solve the questions, he responded, 'I can't do it,' a clear example of learned helplessness. In contrast, his brother consistently tried to solve problems and find solutions. This difference impacts the self-efficacy of the students, with all informants agreeing on the differing achievement levels that the students are likely to reach in the future. According to Klassen (2002), LD students often cope with their difficulties and disabilities by exhibiting high self-efficacy, which may explain the persistent effort of willing twin.

Aydın and Bulgan (2017) noted that nearly all students experience anxiety about receiving low scores due to a fear of failure. Therefore, it is normal for students with LD to have test anxiety. However, the father and teacher of the participants in this study tend to dismiss the students' emotions and feelings. Their biases lead them to label these students as unproductive and unsuccessful.

Conclusion

In summary, the results indicate that the students' motivation levels in mathematics are not necessarily low. However, the limitations posed by their disabilities and the low expectations from their mathematics teachers due to the 'inclusive student'

label may hinder their efforts to take action and strive for success. Another significant finding is that it is very difficult to generalize that all students in IE possess the same characteristics and motivation levels. Despite being twins, the siblings in the study exhibit differences in their achievements, self-beliefs, and the attitudes of their teacher, peers, and parent towards each of them.

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