



Investigating and Comparing the Relationship between Academic Buoyancy, Learning Styles, and School Bonding among Students at Mizan and Public Schools

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Abstract

The present study aimed to investigate and compare the relationship between academic buoyancy, learning styles, and school bonding among students educated via the educational approaches of Mizan and public schools in Tehran. The study was descriptive-correlational. The statistical population comprised 2680 elementary-school students in Tehran in the 2018-2019 academic year. A sample of 600 was selected from public and guided discovery schools (300 students from public and 300 from Mizan guided discovery schools) based on stratified random sampling. The research tools included Martin and Marsh Academic Buoyancy Scale, Grasha-Riechmann Learning Style Survey (LSS), and Rezaei Sharif School Bonding Questionnaire (SBQ). Data were analyzed using the Pearson correlation coefficient and one-way analysis of variance (ANOVA). The results showed that the score of academic buoyancy was significantly higher among students receiving guided discovery than those receiving traditional education ($p < 0.05$). The mean scores of avoidant and competitive learning styles were lower in students receiving guided discovery learning ($p < 0.05$). Furthermore, the mean scores of school bonding and belief in school were higher among students receiving guided discovery than public education. ($p < 0.05$). The study findings further highlighted the significance of considering learning styles and school bonding on academic buoyancy. It is considered a crucial step in understanding the factors affecting academic buoyancy in students.

Keywords: Academic buoyancy, learning styles, Mizan, school bonding, student

Introduction

The elementary education course is a very important course for the development and training of the child's personality, and the formation of the student's personality and all-round development is done more in this course (Darling-Hammond et al., 2020). The teaching pattern plays a very important role in students' learning and in the whole educational process. By using new methods of education, students show great interest in education. In other words, content emphasizes student activation. In the active and modern teaching method, which requires the participation of the student and the

teacher, instead of transferring the material to the student, it pays attention to increasing the learner's ability in the learning process (Vermunt & Donche, 2017). The identification of key factors contributing to effective learning is key to successful education. One such factor is the learning style (Papadatou-Pastou et al., 2018). Similar to many capabilities, learning styles are not inborn, but rather the outcome of one's interactions with the environment during development and socialization. Learning styles form many salient ethical beliefs, financial ideas, social behaviors, and in general, fundamental personality traits (Cheng et al., 2017). Many scholars introduce learning styles as a key factor

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in educational success (Jena, 2018; İlçin et al., 2018). It is generally assumed that students can become more academically successful by recognizing their learning styles, but, in practice, only some of them are aware of these styles (Gokalp, 2013). Research shows that the use of learning strategies is predicted by several motivational variables, including academic buoyancy, and higher levels of academic buoyancy are associated with a higher perception of learning strategies (Comerford et al., 2015; Hirvonen et al., 2020).

Learning is often defined as a fruitful process whereby learners actively approach information, link it to their prior knowledge, and control and direct the learning process (Dortaj, & Allahkarami, 2020). Based on a standard definition, learning styles are specific cognitive, emotional, and psychosocial behaviors used as relatively stable indicators in one's perception of, interaction with, and reaction to the learning environment (Cabual, 2021). Some studies demonstrate that learning problems will be mitigated if students are educated based on their learning preferences in terms of information input and processing (Dantas, & Cunha, 2020; Lethaby, & Mayne, 2020). Learning styles may justify many individual differences in the classroom. Accordingly, if learning is compatible with students' learning styles, learning outcomes will improve. People have different potentials for learning. They learn differently in the same situation, mainly due to their different learning styles which determine how long and to what extent they will pay attention in a situation. Learning styles can thus justify many individual differences in learning (Farhang et al., 2020). In other words, despite their weak relationship with intelligence, learning or cognitive styles greatly affect people's level of learning.

Like all forms of learning, discovery learning means a behavior change; and not any change, but one resulting from experience. Discovery-based approaches stress the development of personal skills and capabilities, in addition to education (Abrahamson & Kapur, 2018). Discovery, or inquiry-based learning, is based on the constructivist theory of learning according to which learners are the discoverer or constructors of knowledge. In this sense, the constructivist theory can be regarded as a discovery-based approach. In terms of teaching methods, discovery learning involves educational situations wherein students achieve the intended goal with the teachers' limited or no guidance (Ramdhani, Usodo, & Subanti, 2017). This method is characterized by the level of guidance provided by the teacher to learners. This guidance can be provided in the following forms: The teacher can explain the principles and solutions to the problems. The teacher can explain only those principles used in discovery learning, but not give

the learners the solution. The teacher may not explain the principles, but explain the solution. The teacher can provide neither the principles nor the solution (discovery learning without teacher guidance). The first case, in which both principles and solutions are explained, and the last case, where neither is provided, are called guided discovery learning (Druckman, & Ebner, 2017). In discovery learning, teachers help the learners recall the principles and their applications. In this sense, the teacher explains the principles but remains silent about the solution. In guided discovery learning, learners have adequate independence, but the teacher monitors them and helps them when necessary. In this method, learners are given the responsibility to find relationships in and organize knowledge, but the teacher is also alert to provide guidance when necessary, so that learners can successfully learn and discover the intended goal (Samifard et al., 2018).

Academic buoyancy has been defined as students' ability to successfully overcome failures and challenges that are common in everyday school life, e.g., poor performance, the pressure of competition, and difficult tasks (Putwain et al., 2012). Based on this definition, academic buoyancy can be a major factor in the psychological-educational perspective and can contribute to solving students' problems in their school life. Academic buoyancy is a factor helping students deal with educational risk factors repeatedly occurring in academic life, especially in difficult situations, e.g., when preparing for an exam, in the face of poor performance, negative feedback from teachers, educational pressure, and at high school (Hirvonen, Putwain, Määttä, Ahonen, & Kiuru, 2020). In this sense, academic buoyancy can be regarded as an educational empowerment structure that can facilitate students' participation in teaching and learning in the classroom (Martin & Marsh, 2019).

Buoyancy, as a component of subjective well-being, is present in many research systems and is a significant indicator of mental health (Hirvonen et al., 2020). Duijn et al. (2011) reported that success in educational settings is contingent on a sense of energy and buoyancy. Academic buoyancy denotes a positive, constructive, and adaptive response to challenges and setbacks experienced in the course of education. It is a form of academic resilience associated with challenges of the regular educational setting (Martin, & Marsh, 2019). A review of the literature on academic buoyancy indicates that this factor leads to major motivations outcomes (e.g., more perseverance), adaptation to educational pressures and challenges, emotional outcomes (e.g., less anxiety and better performance), and superior academic progress and achievement (Martin et al., 2010; Martin et al., 2013; Putwain et al., 2015). According to Diperna

(2006), academic buoyancy is an educational empowerment structure that can facilitate students' participation in teaching and learning in the classroom.

School bonding denotes students' presence, participation, and positive behavior at school, and comprises psychological and behavioral commitment, including a sense of attachment to teachers and peers, commitment to school, and educational and non-educational behaviors (Freidenfelt Liljeberg et al., 2011; Korpershoek et al., 2020). School bonding involves participation at school, commitment to the values and beliefs about school, a subjective sense resulting from being accepted and encouraged in the classroom, and feeling as an integral part of class activity. This concept also comprises students' experiences at school, a sense of safety there, being respected by teachers, affection for school, level of participation, and commitment to school values and beliefs (Berkowitz, 2020; Rovis et al., 2015). Shin and Ryan (2014) reported a positive correlation between school bonding and academic achievement. In other words, students with higher school participation demonstrate significant development due to their interaction and meaningful presence in the school's educational atmosphere (Schlaffer & Burge, 2020). Wang et al. (2019) reported that school bonding correlates with a wide range of positive outcomes such as excellent academic achievement and high psychological adjustment. Although much research has been done on students' academic buoyancy and learning styles in recent years, there has been relatively little research on the contribution of new educational approaches to education. Few kinds of research have examined traditional educational systems in terms of considering the variables of academic buoyancy, learning styles, and school bonding and its integration with the educational space. Therefore, one of the significant innovations of the present study is the proposal of a new educational approach (Mizan) whose theoretical and experimental framework can be a suitable model for the transformation of education. Accordingly, the present study aimed to investigate and compare the relationship between academic buoyancy, learning styles, and school bonding among students at Mizan and public schools in Tehran.

Methods

The present study was descriptive-correlational.

Participants

The statistical population comprised 2680 elementary-school students in Tehran in the 2018-2019 academic year. A sample of 600 was selected from public and guided discovery schools (300 students from public and

300 from Mizan guided discovery schools) based on stratified random sampling. To select the sample, using simple random sampling four public elementary-school and six Mizan guided discovery elementary-school were selected from among the elementary-school in Tehran city. After making coordination with the selected schools for administering the questionnaires, the research objectives were explained to the participants, who then provided written informed consent for participation. After selecting the schools, the participants were selected via random cluster sampling. To this end, a letter of introduction was first obtained from the Research Unit of the Department of Education (Tehran) to enter the schools. Then, by visiting the target schools, coordination was made to access the students. The participants were homogeneous in terms of sex, age, grade, and their parent's education level and occupation. Subsequently, the questionnaires were administered, collected, and scored. The inclusion criteria were: elementary-school students, with average intelligence quotient (IQ), and without any disorder (learning, attention, or concentration disorder). The exclusion criteria were: not responding to >5% of the questions.

Research Instruments

Academic Buoyancy Scale: This nine-item scale was designed by Martin and Marsh (2008) to assess students' academic buoyancy. The items are scored on a five-point Likert scale from 1 (totally disagree) to 5 (totally agree). The minimum and maximum scores obtainable on this scale are 9 and 45, respectively. A higher score indicates a higher level of students' academic buoyancy. This scale is reliable in terms of internal consistency and test-retest reliability (Cronbach's alpha = 0.80, test-retest coefficient = 0.67) (Martin & Marsh, 2008). The results of examining its internal consistency showed that a Cronbach's alpha of 0.80 by removing one item, and a test-retest coefficient of 0.73 (Dehghanizadeh, Hossienchari, Moradi, & Soleymani Khashab, 2014).

Grasha-Riechmann Learning Style Survey (LSS): This 60-item questionnaire assesses six learning styles (independent, avoidant, collaborative, dependent, competitive, and participant). Independent, collaborative, and participant learning styles are constructive, while avoidant, dependent, and competitive styles are non-constructive styles. There are 10 statements for each learning style, and scoring is performed on a five-point Likert scale from "totally disagree" (5) to "totally disagree" (1). The minimum and maximum scores obtainable for each learning styles are 10 and 50, respectively (Ford, Robinson, & Wise, 2016). Baykul et al. (2010) reported a Cronbach's alpha of 0.81 for the whole scale. A Cronbach's alpha coefficient of

0.60, 0.71, 0.75, 0.80, 0.77, and 0.74 were reported for the subscales of independent, dependent, avoidant, collaborative, competitive, and participant, respectively (Pourjamshidi, 2016).

School Bonding Questionnaire (SBQ): SBQ was designed by Rezaei Sharif et al. (2014). This 40-item questionnaire assesses six components of attachment to teachers (questions 1 to 9), attachment to school (questions 10 to 19), attachment to school's staff (questions 20 to 25), involvement in school (questions 26 to 31), belief in (questions 32 to 37) and commitment (questions 38 to 40) to the school. School bonding refers to the students' relationships with the school and other aspects of academic life. A five-point Likert Scale was used for scoring, which started from never (1), to always (5). The minimum and maximum scores obtainable on this questionnaire are 40 and 200, respectively. A higher score indicates a higher level of school bonding. Maddox and Prinz (2003) defined school bonding as participation at school and commitment to the values and beliefs about school. A Cronbach's alpha coefficient of 0.93, 0.88, 0.80, 0.81, 0.73, and 0.73 were reported for the subscales of attachment to teachers, attachment to school, attachment to school's staff, involvement in school, belief in and commitment to the school, respectively (Rezaei Sharif, Hejazi, Gazi Tabatabaei, & Ejei, 2014).

Statistical Analyses

Table 1.
Mean and Standard Deviation (SD) of the Research Variables

Variable	Subscale	Discovery-based approaches		Traditional education	
		M	SD	M	SD
Academic buoyancy		36.44	3.49	31.66	9.30
Constructive learning styles	Independent	23.32	3.58	23.49	6.85
	Collaborative	22.98	3.28	20.57	7.92
	Participant	22.68	3.79	20.93	8.00
Non-constructive learning styles	Avoidant	23.49	3.75	33.81	7.19
	Dependent	22.07	3.34	21.12	6.65
	Competitive	22.45	3.21	25.49	6.86
School bonding	Attachment to teachers	23.00	3.12	25.87	11.60
	Attachment to school	37.00	3.18	28.64	14.04
	Attachment to school's staff	12.00	1.08	16.43	7.63
	Involvement in school	16.00	2.45	16.57	7.71
	Belief in school	22.00	2.14	16.30	9.14
	Commitment to the school	7.00	1.20	8.17	4.46

M: Mean; SD: Standard Deviation

Data were analyzed using the Pearson correlation coefficient and one-way analysis of variance (ANOVA). SPSS software version 21.0 was used to analyze the data

Findings

The participants included 600 male and female students of public and Mizan schools of Tehran, aged 12.63 ± 1.48 years old. The mean and standard deviation of the age of participants in public and Mizan guided discovery schools were 12.25 ± 1.63 and 12.82 ± 1.19 , respectively. The descriptive statistics such as mean and standard deviation (SD) of the research variables are presented in Table 1. Based on Table 2, the mean \pm SD score of academic buoyancy was 36.44 ± 3.49 and 31.66 ± 9.30 among students receiving guided discovery and regular education, respectively. Thus, the mean scores of academic buoyancy was higher among students receiving guided discovery than those educated with regular methods. The mean scores of the subscales of collaborative, dependent, and participant learning styles were higher for students receiving guided discovery learning than those receiving traditional education. However, the mean scores of avoidant and competitive learning styles were lower in students receiving guided discovery learning. Furthermore, the mean scores of school bonding and belief in school were higher among students receiving guided discovery than regular education.

The results of the Pearson correlation coefficient revealed that there was a significant relationship between all research variables ($P < 0.01$) (Table 2).

Table 2.
Pearson Correlation Coefficients of the Research Variables

Variable	1	2	3	4
1- Academic buoyancy	1			
2- Constructive learning styles	0.26**	1		
3- Non-constructive learning styles	-0.27**	-0.14**	1	
4- School bonding	0.18**	0.42**	-0.16**	1

** $: p < 0.01$

The difference in the means of academic buoyancy scores was significant (Table 3). Since this difference was positive, it can be concluded that the scores of academic buoyancy were significantly higher among students receiving guided discovery than traditional education ($p < 0.05$).

The difference in the mean scores of avoidant, collaborative, competitive, and participant learning styles significantly differed in the two groups of students. Since this difference was positive for collaborative and participant styles, it can be concluded that the scores of these subscales were significantly higher among students receiving guided discovery than traditional education. As for avoidant and competitive learning styles, the difference in the means of the two groups was negative. Thus, the scores of these subscales were significantly lower among students receiving guided discovery than traditional education ($p < 0.05$).

The difference in the mean scores of attachment to teachers, attachment to school, attachment to the school's staff, participation at school, and commitment to and belief in school was significant. Since this difference was positive for school bonding and belief in school, it can be concluded that the scores of these subscales were significantly higher among students receiving guided discovery than traditional education. The difference in the mean scores of the two groups was negative for attachment to teachers, attachment to the school's staff, participation at school, and commitment to school, although this difference was not significant for the subscale of participation at school. Therefore, the scores of attachment to teachers, attachment to school's staff, and commitment to school subscales were significantly lower among students receiving guided discovery than traditional education ($p < 0.05$).

Table 3.
Comparison of Mean Scores of the Research Variables Between Two Educational Approaches

Variables	Subscale	t	df	MD	SE	p
Academic buoyancy		2.45	589	1.33	0.54	0.014
Constructive learning styles	Independent	-0.50	589	-0.23	0.45	0.612
	Collaborative	4.84	589	2.42	0.49	0.001
	Participant	5.17	589	2.58	0.49	0.001
Non-constructive learning styles	Avoidant	-21.75	589	-10.23	0.47	0.001
	Dependent	-0.16	589	-0.06	0.37	0.873
	Competitive	-6.55	589	-2.89	0.44	0.001
School bonding	Attachment to teachers	-4.24	589	-2.87	0.67	0.001
	Attachment to school	10.26	589	8.35	0.81	0.001
	Attachment to school's staff	-9.92	589	-4.43	0.44	0.001
	Involvement in school	-1.48	589	-0.57	0.39	0.141
	Belief in school	10.64	589	5.69	0.53	0.001
	Commitment to the school	-4.53	589	-1.17	0.25	0.001

MD: Mean Difference; SE: Standard Error

Discussion

The present study aimed to investigate and compare the relationship between academic buoyancy, learning styles, and school bonding among students at Mizan and public schools.

The findings revealed a significant difference in the mean scores of academic buoyancy among students of discovery-based and traditional schools. As this difference was positive, it can be concluded that the scores of academic buoyancy were significantly higher among students receiving guided discovery than those receiving traditional education. This finding is consistent with the research results of Collie, Martin, Malmberg, Hall, and Ginns, (2015). In daily school life, students face different challenges, obstacles, and pressures that threaten their self-confidence, motivation and, thus, academic performance. Some students succeed in coping with these pressures, while some others do not succeed equally; thus, academic buoyancy refers to a positive, constructive, and adaptive response to different forms of educational challenges and obstacles, including low grades, reduced motivation, and stress, and is a component of psychological well-being. When students perform their assignments spontaneously, they feel not tired or hopeless, but energetic. Having such a feeling about education increases their efforts, perseverance and, eventually, academic performance. There are many educational challenges that need contemplation and are the staple of students' academic life (Martin & Marsh, 2008). When solving these challenges, students with academic buoyancy show higher resistance, have better reflection and attention, and are probably more successful, and these factors improve their academic performance. Academic buoyancy is a multi-dimensional construct, comprising cognitive, motivational, and behavioral dimensions. The cognitive dimension makes students use different cognitive and metacognitive strategies in the learning process. The behavioral dimension increases their efforts and leads to their success in doing the assignments with stability and help-seeking (Collie et al., 2015). In the discovery learning approach, problem-solving skills, correct planning, self-regulation, and responsibility increase students' efforts for placing and directing these behaviors to achieve higher academic buoyancy. Academic buoyancy is a high-level capability that cannot be expected from students spontaneously. Rather, it can be promoted by providing a conducive context, e.g., by reducing mere competition pressure, not comparing the peers, and having great goals that lead to assertiveness and self-confidence. Academic buoyancy is a factor helping students deal with educational risk factors repeatedly occurring in

academic life, especially in difficult situations, e.g., when preparing for an exam, in the face of poor performance, negative feedback from teachers, educational pressure, and at high school. In this sense, academic buoyancy can be regarded as an educational empowerment structure that can facilitate students' participation in teaching and learning in the classroom (Dehghanizadeh et al., 2014).

The results revealed a significant difference in the mean scores of avoidant, collaborative, competitive, and participant learning styles. Since this difference was positive for collaborative and participant styles, the scores of these subscales were significantly higher among students receiving guided discovery than traditional education. The difference in the means of avoidant and competitive learning styles was negative. Thus, the scores of these subscales were significantly lower among students receiving guided discovery than traditional education. This finding is consistent with the research results of Prince, (2004). The principal goal of elementary education is nurturing students' talents. Talents refer to students' potential capabilities. These goals include the development of comprehension in children (promoting communication), development and promotion of skills such as reading, writing, listening, and speaking (expressing emotions), and understanding the fundamental religious, cultural, and national beliefs (Darling-Hammond et al., 2020). In Mizan schools, a guiding teacher is a permanent member of the school council, in charge of supervising all the personality aspects of students during his/her term. By guiding and organizing the teachers in his/her charge, the guiding teacher paves the way for the further growth and development of the students' talents and educating them based on the school's educational goals. Children's cognitive development usually depends on the people living in their world. One's knowledge, thoughts, attitudes, and values evolve through interaction with others. The zone of proximal development (ZPD) refers to a range of tasks children cannot yet perform on their own, but can accomplish with the help of more skillful people (mediators) (Darling-Hammond et al., 2020). In a classroom with a constructive learning environment, learners are expected to show persistent performance. In such a class, students are encouraged and expected to create their ideas and knowledge through execution, implementation, and development of understating. Learners cannot learn only through reception, acquisition, acceptance, or passive attention and listening, because knowledge is not formed through transfer. Thus, education should emphasize the creation of meaning and perception through exposure to new information or contexts. Active learners need participation, knowledge construction, and

collaboration. Active learning is necessary for mastery over knowledge (Prince, 2004). Constructivist learning environments are student-oriented and highlight learner control, responsibility in setting learning goals, adjusting performance to goals, and the relevance of learning materials to learners' lives. Such an environment is characterized by five components: personal relevance (the school's degree of relevance to students' out-of-school experiences), uncertainty (Relative knowledge is the outcome of personal reasoning; therefore, teachers should provide opportunities for learners to discover their scientific knowledge and judge its cultural and social aspects), negotiation (In these environments, teachers are recommended to promote negotiation between students as the main class activity by using appropriate teaching strategies), shared control (Teachers should provide opportunities for students to have some level of control over their learning), and a critical voice (Teachers should be open to criticism so that students' critical attitude towards learning activities can be promoted). A learning environment built upon constructivist principles will be conducive to learning (Kareshki, Ghalbash, & Tatari, 2016).

The findings also revealed that the difference in the mean scores of attachment to teachers, attachment to school, attachment to the school's staff, participation at school, and commitment to and belief in school was significant. Since this difference was positive for school bonding and belief in school, it can be concluded that the scores of these subscales were significantly higher among students receiving guided discovery than traditional education. The difference in the mean scores of the two groups was negative for attachment to teachers, attachment to school's staff, participation at school, and commitment to school, although this difference was not significant for the subscale of participation at school. Therefore, the scores of attachment to teachers, attachment to school's staff, and commitment to school subscales were significantly lower among students receiving guided discovery than traditional education.

Conclusion

According to the study findings, academic buoyancy and school bonding were higher among students receiving guided discovery than those receiving a traditional education. Based on the results of the present study, students at Mizan schools have meaningful interaction and participation in all school affairs and, therefore, actively accompany their teachers in various curricular and extracurricular activities. This establishes an emotional bond between teachers and students and creates a sense of belonging to the school in students.

When students are involved in all the school affairs, they feel they are part of the school family and are sensitive to its affairs and events. In fact, school bonding is stronger in Mizan schools as the students' status is valued there. The study findings further highlighted the significance of considering learning styles and school bonding on academic buoyancy. It is considered a crucial step in understanding the factors affecting academic buoyancy in students.

A limitation of this study was the lack of follow-up for a specific period to re-measure the difference in the scores of the two groups. Moreover, the physical and psychological status of the students was not measured when they completed the questionnaires, which could have affected the results. Another limitation was the lack of access to state-run schools whose data could demonstrate students' status in the examined variables more comprehensively. It is suggested that future studies repeat the research in at least two time periods with a three-month interval for a more reliable generalization of the results. It is also important to closely examine students' physical and psychological status as it can control the effect of other variables and provide more precise results. Finally, as there are a large number of students at state-run schools, accessing and measuring these students can provide more comprehensive information about the studied variables.

Acknowledgements

The researchers wish to thank all the individuals who participated in the study.

Conflict of Interest

No conflicts of interest declared.

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How to Site: Iri, H., Hassanzadeh, R., & Asadi, J. (2021). Investigating and comparing the relationship between academic buoyancy, learning styles, and school bonding among students at Mizan and public schools. *Iranian Journal of Learning & Memory*, 4(14), 48-56. Dor: 20.1001.1.26455455.2021.4.13.10.0



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