

The Role of Teaching Models in Academic Performance and Responsibility Among Students

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ABSTRACT

Purpose: This study aimed to determine the role of teaching models in academic performance and responsibility among students.

Methodology: The research method was quasi-experimental with a pre-test-post-test design and a control group. The statistical population consisted of all master's students in the Faculty of Psychology and Educational Sciences at Allameh Tabataba'i University in the academic year 2018-2019. The research sample included all students present in two classes selected by convenience sampling. One class was designated as the experimental group and the other as the control group. The experimental group received 12 educational sessions, each lasting 90 minutes, based on the Effective University Teaching Model (Lumen, 1995). The control group was taught using traditional methods without an explicit educational model. The Student Responsibility Questionnaire (Soroush, 2012) was used to measure students' responsibility levels. The students' final exam scores were used as an index of academic performance. The collected data were analyzed using descriptive statistics (minimum, maximum, mean, and standard deviation) and inferential statistics (covariance analysis test).

Findings: The mean post-test scores for academic performance and responsibility (individual and social) significantly increased compared to the pre-test in the experimental group. However, the mean post-test scores for academic performance and responsibility (individual and social) did not significantly increase compared to the pre-test in the control group. Additionally, the effect size for academic performance ($\eta^2 = 0.755$), individual responsibility ($\eta^2 = 0.718$), social responsibility ($\eta^2 = 0.710$), and overall responsibility ($\eta^2 = 0.661$) was noted.

Conclusion: The teaching model can have a positive and significant role in enhancing academic performance and individual and social responsibility among students.

Keywords: Teaching Model, Academic Performance, Responsibility.

1. Introduction

In a comprehensive educational process and activity, after providing and preparing all the necessary factors and elements, it is the teacher's turn to teach in the classroom. The teacher aims to influence the knowledge, insight, opinion, attitude, belief, commitment, efficiency, and skills of their students (Golabchi et al., 2024; Hasanpour et al., 2020; Herawati et al., 2024; Kafshchian Moghadam et al., 2024; Karimi et al., 2023; Mahmodi et al., 2023; Ofem, 2023; Russell & Qiu, 2024; Shoghi et al., 2023). The teacher or instructor is at the forefront of cognitive and behavioral reforms in students and, ultimately, in achieving the educational ideals of society (Gage, 2009). After the learner (student), no person or component is as effective in the education and learning of students as the teacher. According to a research report, 50% of the variance in students' academic progress is related to themselves. Family, school, administrators, and peers each predict and explain 5 to 10% of the variance in students' progress. However, the teacher's role alone accounts for 30% (Hattie, 2003).

Teaching requires theoretical knowledge and professional skills. A theoretical approach to teaching is determined by designing, constructing, and implementing models that align the teacher's thought and action with the set of teaching activities. Using teaching models provides a roadmap and guide for appropriate educational interventions and promises professional growth for the teacher. Teaching models include strategic and practical principles and techniques to create a conducive and supportive environment in the learning and teaching process. A teaching model is a plan for organizing the curriculum, arranging educational materials and content, and guiding the flow of teaching and learning toward predetermined goals. Models are used for developing a curriculum, an educational course, selecting educational materials and content, and guiding the teacher's instruction. Models outline and organize the set of educational and learning activities to achieve explicit educational goals (Asadzadeh, 2020).

Student academic performance and learning are the ultimate goals of teaching and the criteria for evaluating the effectiveness of a teacher's work. The level of student success in formal university learning and achieving desirable academic performance are important educational objectives. Additionally, ways to create or enhance individual responsibility are considered significant educational goals. However, student academic performance and responsibility are influenced by various educational and developmental

factors. The professor's teaching model can be a potential and effective intervention. According to research findings, using teaching models has a positive and significant impact on students' conceptual learning (Buckley et al., 2004), enhancing critical thinking and reflective practice among staff (Joyce-McCoach & Smith, 2016), student learning outcomes (Fathiazar et al., 2015), academic progress of students (Ganji et al., 2012), and students' academic performance (Asadzadeh, 2020). Furthermore, responsibility can positively influence social security, social performance, mental health, self-esteem, academic success, and self-actualization (Moosivand & Bagian, 2020).

This study examines the impact of the Effective University Teaching Model (Lowman, 1995) on student academic performance and responsibility. Lowman, by studying the characteristics of a group of exemplary professors and analyzing and interpreting the criteria used for distinguished teachers, presented a two-dimensional model of effective teaching. The first dimension: intellectual stimulation, has two components. The first component focuses on the teacher's ability and mastery in clearly presenting the subject and content. The second component emphasizes the teacher's emotional impact and stimulation of students. The second dimension: effective interpersonal communication, also has two components. The first component refers to the teacher's awareness of emotional conditions and establishing emotional connections in the classroom. The second component addresses the teacher's communication skills and impact with the aim of increasing motivation and positive energy in the classroom while reducing negative energy and demotivation by responding to each student's needs (Morse et al., 2017).

The university is the formal educational system of any country. The elements and factors of the university, ranging from material factors (environment, location, space, budget, equipment) to human factors (professors, administrators, staff) and software factors (goals, programs, processes), interact like a living and constructive ecosystem. The mission and goal of the university are to train specialized, committed, and responsible individuals for their own growth and the development of society. Knowledge, skills, expertise, and individual development require learning, especially university learning. Student success in learning and achieving desirable academic performance is the main goal of the professor's teaching and an indicator of the effectiveness of any educational system. Moreover, ways to develop and deepen individual and social responsibility skills in graduates are considered important educational

goals. Responsibility refers to accepting a task and commitment to performing it correctly. Individual responsibility means that a person considers themselves responsible for their own position and the needs and well-being of others. Individual responsibility paves the way for social responsibility. Social responsibility includes teamwork, commitment, loyalty, individual identity, and general competence while considering one's own and others' interests (Khaje Noori et al., 2015). Responsibility positively impacts social security, social performance, mental health, self-esteem, academic success, and self-actualization (Moosivand & Bagian, 2020). In contrast, lack of responsibility is often associated with social deprivation and negative social evaluations (Khaje Noori et al., 2015).

This study aims to investigate the impact of a university teaching component (the professor's teaching method) on students' academic performance and individual and social responsibility. Based on the objectives, theoretical foundations, and research background, the following questions were raised:

Does the professor's teaching model affect students' academic performance?

Does the professor's teaching model affect students' individual responsibility?

Does the professor's teaching model affect students' social responsibility?

Does the professor's teaching model affect students' overall responsibility?

It is hoped that the results of this study, by expanding specialized teaching knowledge and synergizing related and existing knowledge and studies, can be used by teachers and instructors in schools and universities. Therefore, based on the objectives, theoretical foundations, and research background, the following questions were raised:

2. Methods and Materials

2.1. Study Design and Participants

This quasi-experimental study had an experimental group and a control group. To form the experimental and control groups, two classes of specialized English texts for preschool and elementary education master's students were selected. Then, one class was randomly assigned to the experimental group and the other to the control group. The experimental group was taught based on Lowman's teaching model, while the control group was taught using traditional methods. The teaching model was the independent variable, and academic performance and individual and social

responsibility were the dependent variables in this study. The statistical population included all master's students in the Faculty of Psychology and Educational Sciences at Allameh Tabataba'i University in the academic year 2018-2019. The research sample included all students present in two classes of specialized English texts, selected through convenience sampling. All students present in these two classes formed the statistical sample, totaling 26 students. Then, one class was randomly assigned to the experimental group and the other to the control group. The pre-test and post-test scores and individual, social, and overall responsibility data formed the data for this study.

2.2. Data Collection Tool

The Student Responsibility Questionnaire (Soroush, 2013) was used to measure responsibility. This questionnaire, based on and adapted from Mergler, Spencer, and Patton (2007) and Li, Wright, Rukavina, and Pickering (2008), contains 21 items. Ten items measure individual responsibility, and 11 items measure social responsibility. The questionnaire is designed based on a five-point Likert scale from strongly agree (5), agree (4), neutral (3), disagree (2), and strongly disagree (1). The minimum and maximum scores for individual responsibility are 10 and 50, for social responsibility are 11 and 55, and for overall responsibility are 21 and 105. The reliability coefficients for this scale using Cronbach's alpha were 0.71 and 0.72 for individual responsibility and 0.82, 0.58, and 0.72 for overall responsibility, and 0.79, 0.88, and 0.73 (Moosivand & Bagian, 2020).

All students in the experimental and control groups took a written exam under generally similar conditions. The exam score was used as the measure of students' academic performance. These scores were classified and valued based on a scale from zero to twenty, with 0 to 11.99 considered unacceptable, 12 to 13.99 weak, 14 to 15.99 average, 16 to 18.99 very good, and 19 to 20 excellent. Finally, the collected data were analyzed, interpreted, and reported using descriptive and inferential statistics.

2.3. Intervention

In this study, Lowman's two-dimensional model of effective university teaching (Lowman, 1995) was implemented for the experimental group. According to this model, the first dimension (intellectual stimulation) emphasizes the clarity of the professor's presentation of the teaching content and their emotional impact on students. The

second dimension (effective interpersonal communication) focuses on the professor's awareness of emotional conditions and emotional connections in the classroom and their impact on increasing motivation and positive energy in the classroom while reducing students' demotivation. According to Lowman (1984), teachers implementing this model are described as informed, encouraging, humorous, interested, clear, organized, prepared, exciting, energetic, kind, encouraging, creative, eloquent, articulate, enthusiastic, and participatory in the intellectual stimulation dimension (Lowman, 1984). In the effective interpersonal communication dimension, they are described as concerned, caring, accessible, friendly, sociable, intimate, understanding, and respectful. Based on the theoretical and strategic foundations of this model, the experimental group was taught for 12 sessions of 90 minutes each, within the framework and plan below:

- Announcing the general educational goals of the lesson,
- Determining the students' learning tasks and activities,
- Stating the educational goals of each teaching session,
- Verbally presenting the teaching content in a simple and clear manner,
- Explaining the importance of the teaching content and the necessity of learning it,
- Establishing a connection between new and previous teaching content,
- Regular use of visual aids to highlight teaching content,
- Using metaphors and real-life examples,
- Humor and intimacy in scientific interaction with students,
- Asking questions and providing immediate, positive, and constructive feedback to responses,
- Confirming and praising students' scientific capabilities and learning,
- Inquiring to identify potential learning problems,
- Announcing the schedule for discussions and resolving students' academic issues.

The control group was also taught using the common (traditional) method by announcing the general educational goals of the lesson, presenting the content through lectures, and occasional question-and-answer interactions between the professor and the students. Finally, a test was conducted on the learning of the experimental and control groups under generally similar conditions. Research reports confirm the effectiveness of implementing this model in increasing students' self-efficacy, learning, and academic progress (Morse et al., 2017).

2.4. Data Analysis

The reliability of the research instrument was confirmed with a Cronbach's alpha coefficient of 0.958, indicating high internal consistency. The data analysis was conducted in several stages, focusing on both exploratory and confirmatory techniques.

For the student questionnaire, confirmatory factor analysis (CFA) was performed to validate the structure of the marketing model. Both first-order and second-order CFAs were conducted to examine the relationships among the observed variables and their underlying latent constructs.

For the expert questionnaire, the Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS) method was employed to rank and weight the various dimensions and levels of the marketing model. This multi-criteria decision analysis method helped in identifying the relative importance of each factor in the proposed marketing model.

The results of the analyses classified the marketing model into four levels, 15 dimensions, and 96 components. The levels included macro, higher education, university, and individual. The macro level comprised political, cultural, scientific, and economic dimensions. The higher education level consisted of internal and external dimensions. The university level included seven dimensions: place, people, program factor, prominence, price, prospectus, and promotion. The individual level encompassed personality and motivational dimensions.

The "marketing astrolabe" model was developed based on the weighted importance of each level. The university level was found to have the highest weight at 41%, followed by the higher education level at 25%, the macro level at 23%, and the individual level at 11%. This model provides a comprehensive framework for understanding the key factors influencing international students' decisions to pursue higher education in Iran and offers strategic insights for improving international student recruitment.

3. Findings and Results

In this study, 26 master's students majoring in elementary and preschool education at Allameh Tabataba'i University in Tehran participated (13 in the experimental group and 13 in the control group). The research findings are presented in both descriptive and inferential sections. The results showed that the mean age of the participants was 26.74 ± 3.74 years in the experimental group and 26.13 ± 3.22 years in the control group. Additionally, among the experimental group, there were 7 females (53.85%) and 6 males (46.15%), while

the control group consisted of 6 females (46.15%) and 7 males (53.85%).

Table 1

Descriptive Characteristics of Research Variables in Pre-test and Post-test Stages

Variables	Groups	Pre-test Mean (SD)	Post-test Mean (SD)
Academic Performance	Experimental	16.88 (0.65)	19.15 (0.55)
	Control	16.53 (0.72)	17.11 (0.86)
Individual Responsibility	Experimental	38.23 (3.83)	44.30 (2.98)
	Control	37.84 (4.16)	38.46 (4.03)
Social Responsibility	Experimental	36.46 (3.33)	42.46 (3.01)
	Control	36.15 (3.33)	36.15 (3.89)
Overall Responsibility	Experimental	74.53 (5.96)	86.53 (6.45)
	Control	74.30 (6.08)	74.69 (6.70)

For inferential data analysis, the covariance analysis test was used. Before conducting this test, Shapiro-Wilk, Levene, and homogeneity of regression slope tests were performed to meet its assumptions. The Shapiro-Wilk test results indicated that the data distribution in both experimental and control groups was normal at the post-test

stage. Additionally, the non-significant results of the Levene test showed that the assumption of equal variances between groups was met, and the variance of the dependent variable errors was equal in both groups at the post-test stage. The homogeneity of regression slopes test results was also not statistically significant.

Table 2

Analysis of Covariance (ANCOVA) Results

Variable	Source	Sum of Squares	df	Mean Square	F	P	Eta
Academic Performance	Between Group	60.12	1	60.12	61.48	<.001	.76
	Within Groups	23.93	24	1.00			
Individual Responsibility	Between Group	39.38	1	39.38	50.81	<.001	.72
	Within Groups	18.59	24	0.77			
Social Responsibility	Between Group	37.22	1	37.22	49.05	<.001	.71
	Within Groups	18.21	24	0.76			
Overall Responsibility	Between Group	85.32	1	85.32	38.93	<.001	.66
	Within Groups	52.61	24	2.19			

The mean post-test scores for academic performance increased compared to the pre-test in the experimental group ($F = 61.48$, $P < .001$, $Eta = .76$). However, the mean post-test scores for academic performance did not significantly increase compared to the pre-test in the control group.

The mean post-test scores for individual responsibility increased compared to the pre-test in the experimental group ($F = 50.81$, $P < .001$, $Eta = .72$). However, the mean post-test scores for individual responsibility did not significantly increase compared to the pre-test in the control group.

The mean post-test scores for social responsibility increased compared to the pre-test in the experimental group ($F = 49.05$, $P < .001$, $Eta = .71$). However, the mean post-test scores for social responsibility did not significantly increase compared to the pre-test in the control group.

The mean post-test scores for overall responsibility increased compared to the pre-test in the experimental group ($F = 38.93$, $P < .001$, $Eta = .66$). However, the mean post-test scores for overall responsibility did not significantly increase compared to the pre-test in the control group.

According to the findings, the effect sizes for academic performance ($Eta = .76$), individual responsibility ($Eta = .72$), social responsibility ($Eta = .71$), and overall responsibility ($Eta = .66$) were significant. Therefore, it can be concluded that the professor's teaching model (Lowman's model) had a positive and significant impact on increasing the scores of academic performance, individual responsibility, social responsibility, and overall responsibility of students in the experimental group.

4. Discussion and Conclusion

This study examined the impact of the professor's teaching model on students' academic performance and individual and social responsibility. The findings showed that the professor's teaching model could have a positive and significant impact on students' academic performance and individual and social responsibility. Previous research has highlighted the effect of using teaching models on student engagement, performance, and academic progress. Edwards (2017) found that model-based teaching is effective in the academic progress and metacognition of high school students in advanced chemistry classes (Edwards, 2017). Van Loo (2017) found that inquiry-based teaching methods positively affect high school students' engagement and scientific activities (Van Loo, 2017). Xu (2020) found that constructing and implementing a university teaching model for English language increased students' willingness to participate in class discussions and their motivation and initiative in learning activities. Why can using an appropriate teaching model affect motivation, engagement, classroom activities, learning, and ultimately the academic progress of students? Wilson et al. (2020) suggest that as an educational tool, models can transform the learner's experience from static to dynamic, from flat and one-dimensional to three-dimensional, and from individualistic to cohesive and integrated (Wilson et al., 2020).

Research findings have confirmed the role of the teaching model in encouraging individual and social responsibility among students. Escartí, Gutiérrez, Pascual, and Marín (2010) used Hellison's model of teaching based on individual and social responsibility in physical education to enhance responsibility behaviors and self-regulated learning in at-risk adolescents (Escartí et al., 2010). Manzano-Sánchez, Gómez-Mármol, and Valero-Valenzuela (2020) found that constructing and implementing a teaching model based on individual and social responsibility led to positive attitudes among teachers and students toward the implemented model (Manzano-Sánchez & Valero-Valenzuela, 2019). The value of individual and social responsibility in the eyes of students increased, and students showed better academic performance. Moosivand and Bagian Koulemarzi (2021) also indicated a positive and significant relationship between responsibility and academic progress of students (Moosivand & Bagian, 2020).

The confirmation of the positive and significant role of the professor's teaching model on students' academic performance and individual and social responsibility

underscores the importance and application of this teaching model. It is suggested that university instructors and professors pay more attention to the role of the teaching model in their educational activities, student learning, and fostering and enhancing the spirit of responsibility in students. However, convenience sampling, using the course grade as the sole indicator of academic performance, self-reporting for individual and social responsibility, and other intervening variables caution the generalization and application of these research results.

This study has several limitations that should be noted. Firstly, the sample size was relatively small, with only 26 participants, which may limit the generalizability of the findings. The use of convenience sampling may introduce selection bias, and the study's reliance on self-reported measures for individual and social responsibility could be subject to response biases. Additionally, using course grades as the sole indicator of academic performance may not fully capture the comprehensive academic abilities of the students. Other potential intervening variables that were not controlled for in this study might also influence the outcomes. Therefore, caution should be exercised in generalizing the results and applying them to broader contexts.

Future research should consider employing larger and more diverse sample sizes to enhance the generalizability of the findings. Random sampling methods could be used to minimize selection bias. Incorporating additional measures of academic performance, such as standardized test scores or longitudinal academic records, would provide a more comprehensive assessment of students' academic abilities. Future studies should also explore the impact of various teaching models across different educational levels and subject areas. Furthermore, qualitative research methods, such as interviews and focus groups, could provide deeper insights into students' experiences and perceptions of different teaching models and their influence on responsibility and academic performance.

The findings of this study highlight the significant impact of effective teaching models, such as Lowman's model, on enhancing students' academic performance and individual and social responsibility. University instructors and professors should be encouraged to adopt evidence-based teaching models that foster student engagement and responsibility. Professional development programs focusing on effective teaching strategies and classroom management could be implemented to support educators in this endeavor. Educational policymakers should consider integrating

effective teaching models into the curriculum design and teacher training programs to promote a more dynamic and responsible learning environment. By prioritizing these teaching approaches, educational institutions can better prepare students to succeed academically and contribute positively to society.

Authors' Contributions

The first author was responsible for conducting the interview and collecting data, and the other authors were responsible for analyzing the data and writing the article.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethics Considerations

In this study, to observe ethical considerations, participants were informed about the goals and importance of the research before the start of the interview and participated in the research with informed consent.

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