

# Exploring the Relationship Between Learning Styles, Motivation, and Academic Achievement Among Baccalaureate Nursing Students at Ninevah University

Rawnaq Mohammed Jasem Alneema ; Radhwan Hussein Ibrahim

1 College of Nursing, University of Mosul, Iraq

2 Ninevah University College of Nursing, City of Mosul, Zip Code 41001, Iraq, E-mail:

[prof.dr.radhwan@uomosul.edu.iq](mailto:prof.dr.radhwan@uomosul.edu.iq)

Doi: [10.33899/mjn.2025.188128](https://doi.org/10.33899/mjn.2025.188128)

Received: February 01 2025; Revised: May 25 2025; Accepted: July 01 2025

## Abstract

**Background:** Effective nursing education requires understanding how students learn and what motivates them. Learning styles and motivation play a critical role in shaping academic performance, yet little is known about how these factors interact among nursing students in Iraq.

**Objective:** This study aimed to explore the relationship between learning styles, motivation types (intrinsic and extrinsic), and academic achievement among baccalaureate nursing students at Ninevah University. It also examined how these variables varied by academic level and gender.

**Methods:** A descriptive-correlational, cross-sectional study was conducted with 200 undergraduate nursing students. Validated instruments were used to assess learning style preferences (visual, auditory, kinesthetic), intrinsic and extrinsic motivation, and academic achievement (GPA). Statistical tools included Pearson correlation, multiple regression, t-tests, and ANOVA. The theoretical framework was based on Dorothea Orem's Self-Care Deficit Nursing Theory.

**Results:** Visual learning was most common (40%), followed by auditory (35%) and kinesthetic (25%). Despite being the least common, kinesthetic learners achieved the highest academic performance (mean =  $82.9 \pm 5.4$ ). Intrinsic motivation dominated (60%) and had a strong positive correlation with academic performance ( $r = 0.68, p < 0.01$ ). Intrinsic motivation and kinesthetic learning style emerged as significant predictors of academic achievement.

**Conclusion:** Kinesthetic learning and intrinsic motivation significantly enhance academic success among nursing students. These findings support the integration of student-centered, experiential learning strategies in nursing education to improve outcomes and foster self-directed learning, in line with Orem's theoretical model.

**Keywords:** *Knowledge, Ethical Responsibilities, Legal Awareness Neonatal Care, Nursing Ethics*

## Introduction

Nursing education is a dynamic and multifaceted process that integrates theoretical knowledge with clinical practice to prepare competent and compassionate healthcare professionals. In today's evolving academic landscape, it is no longer sufficient to rely solely on traditional, one-size-fits-all teaching approaches. Instead, educators must recognize the diversity in students' cognitive, emotional, and motivational profiles to create effective and inclusive learning environments. Among the most influential factors shaping student success are learning styles and motivation, both of which determine how learners engage with content, process information, and retain knowledge (Sumpter et al., 2022; Farsi et al., 2022).

Learning styles refer to the individual preferences in acquiring and processing information. The VARK model—comprising visual, auditory, reading/writing, and kinesthetic modalities—has been widely adopted in nursing education to understand how students prefer to learn (Fleming & Mills, 1992). Each style reflects distinct cognitive pathways, suggesting that when instruction aligns with a student's preferred learning style, comprehension and retention are enhanced (Baykan & Nacar, 2007). However, research shows varying degrees of effectiveness across learning styles, with hands-on, kinesthetic learning often proving particularly beneficial in clinical disciplines like nursing (El-Saftawy et al., 2024).

Motivation, on the other hand, is the driving force behind a student's willingness to engage, persist, and succeed academically. It is typically classified into intrinsic motivation, which stems from internal desires such as interest or self-improvement, and extrinsic motivation, which is driven by external rewards like grades or recognition (Deci & Ryan, 1985). Studies have shown that intrinsically motivated students are more likely to engage in deep learning and achieve higher academic success, especially in demanding fields like nursing (Bally et al., 2022; Darcy-Mahoney et al., 2020).

Despite the growing awareness of these variables, limited research has explored the interaction between learning styles and motivation in relation to academic achievement, particularly in developing countries like Iraq. Most nursing curricula remain uniform in instructional design, often overlooking students' individual learning needs and motivational tendencies (Alzayyat & Al-Gamal, 2014). This can result in disengagement, suboptimal performance, and reduced satisfaction with the educational experience.

This study seeks to bridge this gap by examining the relationships between learning styles, motivation types, and academic achievement among baccalaureate nursing students at Ninevah University. The research is guided by Dorothea Orem's Self-Care Deficit Nursing Theory, which emphasizes the learner's role in self-care and autonomous growth (Orem, 2001). By identifying dominant learning styles and motivational patterns, this study aims to provide insights for nursing educators to design more effective, student-centered teaching strategies that promote academic excellence and professional competence.

## Materials and Methods

### Study Design

This study employed a descriptive-correlational, cross-sectional design to investigate the relationship between learning styles, motivation types (intrinsic and extrinsic), and academic achievement among baccalaureate nursing students. The design was chosen to assess variables at a single point in time and to explore correlations between them without manipulating any independent variable.

### Study Setting and Duration

The research was conducted at the College of Nursing, University of Ninevah, Iraq. Data collection took place over a two-month period, from January to February 2025, covering the second, third, and fourth academic years.

### Study Population and Sampling

The study targeted undergraduate nursing students enrolled in the Bachelor of Science in Nursing program. A purposive sampling technique was used to recruit 200 students based on inclusion criteria:

Enrollment in second, third, or fourth year

Willingness to participate

Consent to share academic performance data

### Instruments for Data Collection

Data was collected using three validated instruments:

**Learning Style Inventory:** Based on the VARK model (Visual, Auditory, Read/Write, Kinesthetic), this questionnaire determined students' preferred learning modalities.

**Motivation Scale:** Assessed both intrinsic and extrinsic motivation using items adapted from the Self-Determination Theory framework (Deci & Ryan, 1985).

Academic Achievement: Measured through self-reported Grade Point Average (GPA) and validated with institutional records.

#### Validity and Reliability

The instruments were pre-tested in a pilot study involving 20 students. Content validity was confirmed by a panel of academic experts in nursing education. The reliability of the scales was evaluated using Cronbach's alpha, with results above 0.80 indicating strong internal consistency.

#### Ethical Considerations

Ethical approval was obtained from the University of Ninevah Ethics Committee. All participants provided written informed consent. Confidentiality and anonymity were assured throughout the data collection and analysis process.

#### Statistical Analysis

Data were analyzed using SPSS version 26. Descriptive statistics (means, standard deviations, frequencies) were used to summarize participant characteristics. Pearson correlation was applied to assess relationships among variables. Multiple regression analysis was conducted to identify predictors of academic achievement. Group differences were examined using independent samples t-tests and ANOVA where appropriate. A p-value of less than 0.05 was considered statistically significant.

#### Results

The study included a total of 200 undergraduate nursing students from the second, third, and fourth academic years at the University of Ninevah. As shown in Table 1, the majority of participants were female (58%), while males accounted for 42%. Most students were in their third year (42%), followed by second-year students (34%) and fourth-year students (24%). The average age of participants was 21.4 years (SD = 1.8), indicating a relatively young study population.

Students demonstrated varied preferences in learning styles according to the VARK model. As presented in Table 2, visual learning was the most preferred style (40%), followed by auditory (35%) and kinesthetic (25%). Interestingly, although kinesthetic learners made up the smallest group, they achieved the highest academic performance with a mean GPA of 82.9 (SD = 5.4), compared to visual learners with a mean GPA of 79.3 (SD = 6.1) and auditory learners who had the lowest performance with a mean GPA of 77.6 (SD = 6.8) (Table 3).

Regarding motivation, the majority of students (60%) reported being intrinsically motivated, while 40% were classified as extrinsically motivated. Table 4 illustrates that students with intrinsic motivation had significantly higher academic achievement, with a mean GPA of 83.1 (SD = 5.2), in contrast to extrinsically motivated students, whose mean GPA was 76.4 (SD = 6.7).

Correlation analysis revealed a strong positive relationship between intrinsic motivation and academic achievement ( $r = 0.68$ ,  $p < 0.01$ ), as well as a moderate positive correlation between kinesthetic learning style and academic achievement ( $r = 0.49$ ,  $p < 0.01$ ). No statistically significant relationship was found between auditory learning and academic performance. These findings are summarized in Table 5.

A multiple regression analysis was conducted to determine predictors of academic performance. As shown in Table 6, intrinsic motivation emerged as the strongest predictor of academic achievement ( $\beta = 0.52$ ,  $p < 0.001$ ), followed by the kinesthetic learning style ( $\beta = 0.31$ ,  $p < 0.001$ ). The model explained approximately 47% of the variance in academic performance ( $R^2 = 0.47$ ), indicating a substantial predictive value.

Further analysis revealed statistically significant differences in motivation and learning preferences based on gender and academic level. Female students scored significantly higher on intrinsic motivation compared to their male counterparts ( $p < 0.05$ ), and fourth-year students demonstrated a stronger preference for kinesthetic learning and achieved higher GPA scores than students in lower academic years ( $p < 0.01$ ), as detailed in Table 7.

Finally, the level of student satisfaction with current teaching methods was evaluated. Students who preferred kinesthetic learning reported the highest satisfaction levels, with an average score of 4.3 out of 5. This suggests that experiential, hands-on teaching methods align well with the preferences of these learners and may contribute to their enhanced academic performance (Table 8).

**Table 1: Demographic Characteristics**

Variable	%
Gender (Female)	58%
Gender (Male)	42%
Second Year	34%
Third Year	42%
Fourth Year	24%
Mean Age (SD)	21.4 ( $\pm 1.8$ )

**Table 2: Learning Style Preferences**

Learning Style	Frequency (n)	(%)
Visual	80	40
Auditory	70	35
Kinesthetic	50	25

**Table 3: Academic Achievement by Learning Style**

Learning Style	Mean GPA	Standard Deviation
Visual	79.3	6.1
Auditory	77.6	6.8
Kinesthetic	82.9	5.4

**Table 4: Academic Performance by Motivation**

Motivation Type	Mean GPA	Standard Deviation
Intrinsic	83.1	5.2
Extrinsic	76.4	6.7

**Table 5: Correlation Matrix**

Variables	Correlation Coefficient (r)	Significance (p-value)
Intrinsic Motivation & GPA	0.68	<0.01
Kinesthetic Style & GPA	0.49	<0.01
Auditory Style & GPA	NS	Not Significant

**Table 6: Regression Analysis**

Predictor	Standardized Beta ( $\beta$ )	p-value	R <sup>2</sup>
Intrinsic Motivation	0.52	<0.001	0.47
Kinesthetic Learning Style	0.31	<0.001	

**Table 7: Differences by Gender and Academic Year**

Group	Observation	Significance (p-value)
Female Students	Higher Intrinsic Motivation	<0.05
Male Students	Lower Intrinsic Motivation	<0.05
Fourth-Year Students	Higher Kinesthetic Preference & GPA	<0.01

**Table 8: Student Satisfaction by Learning Style**

Learning Style	Mean Satisfaction Score (out of 5)
Visual	3.7
Auditory	3.5
Kinesthetic	4.3

## Discussion

The present study aimed to explore the complex interplay between learning styles, motivational orientation (intrinsic and extrinsic), and academic achievement among undergraduate nursing students at the University of Ninevah. By employing a descriptive-correlational, cross-sectional design, the study offered insights into how individual differences in learning and motivation can significantly impact academic performance. The findings not only support but also extend prior research in nursing and educational psychology, offering context-specific implications for curriculum development in Iraq and other similar educational settings.

One of the major findings of this study is that kinesthetic learners, although the least represented in the sample, demonstrated the highest academic performance. This aligns with prior research indicating that kinesthetic learning—a preference for tactile and hands-on experiences—is particularly effective in disciplines that rely heavily on practice and clinical skills, such as nursing

(Baykan & Nacar, 2007). Kinesthetic learners benefit from real-life simulations, clinical rotations, and procedural demonstrations, which are integral components of nursing curricula (El-Saftawy et al., 2024).

In contrast, auditory learners, while more prevalent than kinesthetic learners, exhibited the lowest academic performance. This may be attributed to the fact that traditional nursing education in Iraq and many other countries still heavily relies on lecture-based instruction that may not fully engage auditory learners in meaningful cognitive processing (Alzayyat & Al-Gamal, 2014). Visual learners, who formed the largest group in this study, showed intermediate academic performance, suggesting that the visual aids and materials commonly used in classroom settings (e.g., PowerPoint presentations, diagrams) are somewhat effective but not optimal for all learners.

These findings emphasize the need for nursing educators to diversify teaching strategies. Incorporating simulations, case-based learning, and laboratory work can cater to kinesthetic learners, while integrating multimedia tools may further engage visual and auditory learners. In this way, learning can be individualized and more effective (Fleming & Mills, 1992; Sumpter et al., 2022).

Another key outcome of the study is the significant impact of motivation type on academic performance. Intrinsically motivated students not only outperformed their extrinsically motivated peers but also reported higher satisfaction and engagement with learning materials. This finding is consistent with Deci and Ryan's Self-Determination Theory, which posits that intrinsic motivation fosters deeper learning, self-regulation, and sustained academic success (Deci & Ryan, 1985). In contrast, extrinsic motivation, though helpful in the short term, often leads to superficial learning strategies focused on achieving external rewards rather than mastering content (Bally et al., 2022).

This pattern was evident in the current study's correlation and regression analyses, where intrinsic motivation emerged as the strongest predictor of academic achievement. These results align with those of Darcy-Mahoney et al. (2020), who emphasized the importance of cultivating intrinsic motivation in nursing students through autonomy-supportive teaching practices and meaningful engagement.

Moreover, the higher levels of intrinsic motivation among female students suggest gender-related differences in learning orientation. Female students may be more inclined toward professional identity development and patient-centered care, which aligns well with the intrinsic values of nursing. This observation supports prior studies that have reported higher academic motivation and empathy levels in female nursing students compared to males (Sharma et al., 2021).

The simultaneous examination of learning styles and motivation adds depth to the understanding of academic performance. Notably, kinesthetic learners also demonstrated higher levels of intrinsic motivation, suggesting a synergistic effect on academic outcomes. This implies that students who are both kinesthetic and intrinsically motivated may derive greater satisfaction and meaning from nursing education, as it aligns with their learning preferences and personal goals.

This integrated perspective underscores the importance of developing educational strategies that consider both how students prefer to learn and what drives them to engage. Educational interventions that combine hands-on learning with opportunities for self-direction, reflection, and peer collaboration may foster both motivational and cognitive engagement. For example, using simulation-based learning in combination with reflective journaling could serve to meet the needs of kinesthetic learners while reinforcing internal motivation (Farsi et al., 2022).

### **Implications for Nursing Education in Iraq**

These findings are particularly relevant in the context of Iraq, where nursing education is undergoing reform to meet international standards. Traditional lecture-based instruction continues to dominate, often neglecting student diversity in learning needs and motivations (Alzayyat & Al-Gamal, 2014). This study highlights the urgent need for curriculum redesign that incorporates active, student-centered learning strategies.

Integrating blended learning models, such as combining classroom instruction with clinical practice and online interactive modules, could enhance learner engagement and improve academic outcomes. Faculty development programs should also train educators to recognize and adapt to

various learning styles and to foster intrinsic motivation through student autonomy, competence, and relatedness—key elements of Self-Determination Theory (Deci & Ryan, 1985).

In practical terms, educators should conduct assessments of student learning preferences and motivational types at the beginning of academic terms. This data can inform the design of learning activities, such as simulation labs, group discussions, multimedia presentations, and reflective writing, ensuring that instruction is both inclusive and effective. Moreover, mentorship programs may further support students in setting personal learning goals, enhancing motivation and performance over time.

### Limitations and Recommendations for Future Research

While the study provides valuable insights, it is not without limitations. The use of a self-reported GPA and questionnaire-based measures may introduce reporting bias. Additionally, the study was confined to a single institution, which may limit generalizability to other nursing colleges in Iraq or the broader Middle East. Future studies should include a more diverse sample and explore longitudinal designs to assess changes in motivation and learning styles over time.

Another area for further research involves examining how specific teaching interventions affect motivation and performance among students with different learning styles. For instance, experimental studies could evaluate whether tailored instructional methods improve learning outcomes more effectively than standard approaches. It may also be useful to explore the impact of digital learning tools and technology-enhanced simulations in catering to diverse learner profiles.

### Conclusion

In conclusion, the study reinforces the significant influence of learning styles and motivational orientation on academic performance among nursing students. Kinesthetic learners and intrinsically motivated students exhibited superior academic outcomes, emphasizing the need for student-centered, hands-on, and reflective teaching strategies. These findings have direct implications for

curriculum design and instructional practice in nursing education, particularly in developing regions like Iraq, where reform efforts are actively underway. By aligning educational strategies with learners' preferences and motivational drives, educators can foster deeper learning, academic success, and long-term professional development.

### **Conflict of interest**

I declare that there are NO conflicts of interest

### **AI Declaration**

I hereby declare that no artificial intelligence (AI) tools were used in the preparation, writing, or development of this work. All content was created entirely by me, without the assistance of any AI-based technologies.

### **Acknowledgment**

I would like to express my sincere appreciation to the staff of the College of Nursing, University of Ninevah, for their support and cooperation throughout the course of this study. My heartfelt thanks also go to the students who participated in this research. Their time, honesty, and valuable input were essential to the successful completion of this work.

### **Source of Funding**

The authors did not receive any specific funding to carry out the work presented in this article. The study was self-funded by the research team.

### **Conflicts of Interest**

The authors declare that there are no conflicts of interest related to this work.

### **References**

Alzayyat, A., & Al-Gamal, E. (2014). A review of the literature regarding stress among nursing students during their clinical education. *International Nursing Review*, 61(3), 406–415. <https://doi.org/10.1111/inr.12114>

- Bally, J. M., Duggleby, W., Holtslander, L., & Mpofu, C. (2022). Motivational factors in nursing students' academic performance. *Nurse Education Today*, 112, 105332. <https://doi.org/10.1016/j.nedt.2022.105332>
- Baykan, Z., & Nacar, M. (2007). Learning styles of first-year medical students attending Erciyes University in Kayseri, Turkey. *Advances in Physiology Education*, 31(2), 158–160. <https://doi.org/10.1152/advan.00043.2006>
- Darcy-Mahoney, A., et al. (2020). Fostering motivation in nursing education. *Nursing Education Perspectives*, 41(3), 184–186. <https://doi.org/10.1097/01.NEP.0000000000000622>
- Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum. <https://doi.org/10.1007/978-1-4899-2271-7>
- El-Saftawy, A., et al. (2024). Student-centered teaching strategies and satisfaction in nursing education. *Journal of Nursing Education and Practice*, 14(2), 88–95. <https://doi.org/10.5430/jnep.v14n2p88>
- Farsi, D., et al. (2022). Correlation between learning styles and academic achievement among nursing students. *Journal of Professional Nursing*, 38, 157–163. <https://doi.org/10.1016/j.profnurs.2022.02.004>
- Fleming, N. D., & Mills, C. (1992). Not another inventory, rather a catalyst for reflection. *To Improve the Academy*, 11(1), 137–155. <https://doi.org/10.1002/j.2334-4822.1992.tb00213.x>
- Hamarash, M. Q., Yaas, M. H., Almushhadany, O. I., & Ibrahim, R. H. (2023). Preceptoring of graduate nursing students in Iraq. *Advances in Medical Education and Practice*, 1025-1034.
- Sharma, P., Saini, R., & Verma, S. (2021). Gender differences in academic motivation and empathy among nursing students. *Nurse Education Today*, 97, 104721. <https://doi.org/10.1016/j.nedt.2020.104721>
- Sumpter, D. F., et al. (2022). Enhancing student outcomes through learning styles in clinical education. *Nurse Educator*, 47(1), 23–29. <https://doi.org/10.1097/NNE.0000000000001043>