VIETNAMESE NURSING STUDENTS' SATISFACTION WITH ANATOMY LEARNING: A CROSS-SECTIONAL STUDY

Do Thi Ha[1], Phan Quoc Phong[2]*, Phan Thi My Trinh[1]

ABSTRACT

Background: Understanding students' satisfaction with anatomy, a foundational nursing subject, can inform improvements in teaching, engagement, and outcomes. **Objectives:** Assessed nursing students' self reported satisfaction with anatomy learning across three domains - Perceived course learnability, Perceived learning community support, and Perceived learning effectiveness - adapted from Eagleton's framework and examined its association with students' demographic characteristics. It also described students' self-directed learning behaviors that supported their anatomy understanding. **Methods:** A cross-sectional study was conducted among 132 first-year Bachelor of Nursing students at Pham Ngoc Thach University of Medicine. A validated questionnaire with 18 items covering the three domains adapted from Eagleton's framework was administered. Data were analyzed using descriptive statistics and Chi-square tests. **Results:** The overall rate of satisfaction with anatomy learning was 83.8%. Among the three domains, students indicated learning community support had the highest score (92.6%), followed by perceived course learnability (90.8%) and learning effectiveness (76.0%). Female students reported significantly higher satisfaction in community learning support than male students ($p = 0.014$). These satisfaction domains reflect students' subjective perceptions of personal learning experiences, rather than actual learning outcomes. **Conclusion:** While students expressed high overall satisfaction with anatomy learning, lower scores in learning effectiveness highlight a need to enhance instructional strategies and student-centered approaches. As conceptualized by Eagleton, these domains represent students' subjective perceptions of learning, not actual performance. Improving students' perceived satisfaction with learning effectiveness needs to be further studied their achievement of learning outcomes, which could then inform instructional enhancements, particularly within foundational courses like Anatomy.

Keywords: *Learning satisfaction, Anatomy, nursing students, self-directed learning, Vietnam*

[1] *Faculty of Nursing and Medical Technology, Pham Ngoc Thach University of Medicine, Ho Chi Minh City, Vietnam*

[2] *Department of Anatomy, Pham Ngoc Thach University of Medicine, Ho Chi Minh City, Vietnam*

Responsible person: Phan Quoc Phong

Email: tieuphong@pnt.edu.vn

Date of receipt: 27.1.2026

Date of scientific judgment: 17.3.2026

Reviewed date: 5.5.2026

I. INTRODUCTION

Student satisfaction is increasingly recognized as a multidimensional construct that reflects learners' perceptions of their educational experiences, including emotional engagement, perceived value, and instructional quality (1,2). In foundational health sciences courses such as Anatomy, which require high cognitive load and abstract reasoning, student satisfaction with their learning is not only an outcome but also a predictor of motivation, persistence, and academic engagement (2). For nursing students, Anatomy can be challenging due to its heavy theoretical content and complex spatial structures, demanding high cognitive engagement (3). Eagleton (2015) conceptualized learning satisfaction across three interrelated dimensions: perceived course learnability, learning community support, and perceived learning effectiveness. "Perceived course learnability" refers to students' belief in the accessibility and relevance of course content, which influences their motivation to engage. "Learning community support" encompasses peer collaboration and faculty guidance, while "perceived learning effectiveness" relates to students' appraisal of their ability to acquire and apply knowledge meaningfully. These components reflect not merely academic outcomes but also the subjective educational experience, making them valuable indicators in curriculum evaluation and improvement (2).

In the Vietnamese context, most studies on student satisfaction have concentrated on clinical training or general educational environments rather than specific theoretical learning in foundational subjects. A study at Da Nang University of Medical Technology and Pharmacy found that nursing students reported high satisfaction with simulation-based clinical learning, which was linked to improved self-confidence in practice (4). Similarly, a study at Can Tho University of Medicine and Pharmacy observed high satisfaction scores related to faculty support and clinical environments (5). However, these studies primarily focused on broad experiential learning contexts and did not

address students' subjective perceptions of satisfaction in specific foundational subjects such as Anatomy. Anatomy, as a core subject taught in the first year of nursing programs, plays a critical role in developing students' foundational knowledge. This foundational knowledge is essential for achieving national nursing competency standards in Vietnam (6).

At Pham Ngoc Thach University of Medicine, Anatomy is delivered through a combination of didactic lectures and structured laboratory sessions. Lectures are enhanced with multimedia resources such as anatomical animations, 2D and 3D models to support visual learning and engagement. In laboratory sessions, students revisit theoretical content, observe instructor-led demonstrations using anatomical models and real human bones, and engage in peer discussions and hands-on practice. While these activities foster active engagement, the course does not include simulation-based training or advanced interactive platforms. At the undergraduate nursing level, students do not engage in cadaver-based dissection, unlike medical students. Instead, anatomical instruction relies on plastic models, real bones, visual resources, and guided demonstrations in laboratory settings. This limitation may influence the depth of spatial understanding and reduce opportunities for hands-on experience in anatomy learning.

This study aimed to assess students' satisfaction with anatomy learning based on three components, perceived learnability, learning community support, and perceived effectiveness, among first-year nursing students at Pham Ngoc Thach University of Medicine and examined how satisfaction levels vary by demographic characteristics such as gender, place of residence, and family economic status. In addition to exploring students' satisfaction, this study also sheds light on the self-directed learning actions undertaken by nursing students to enhance their understanding of Anatomy, through ensuring adequate exposure to online resources, consulting lecturers and peers, and engaging in independent textbook reading. In this study, learning satisfaction is conceptualized as students' subjective perceptions of enjoyment, relevance, confidence, and support received during the learning process, rather than objective academic performance. These perceptions are operationalized through self-reported agreement across three domains adapted from Eagleton's framework (2015).

II. METHODS

Design and Participants

This was a descriptive cross-sectional study conducted in January 2023 at Pham Ngoc Thach University of Medicine in Ho Chi Minh City, Vietnam. The study targeted first-year Bachelor of Nursing students who had completed the Anatomy course during the first semester of the academic year. Among 181 eligible students enrolled in the cohort, 132 students consented to participate and completed the questionnaire, yielding a response rate of 72.9%. Participants were recruited using convenience sampling. Inclusion criteria were: (1) current enrollment as a first-year nursing student, (2) having undertaken the full Anatomy course, regardless of final results, and (3) voluntary consent to participate. Students who were absent during data collection or declined participation were excluded.

Instruments

Data were collected using a structured self-administered questionnaire adapted from the Learning Satisfaction Questionnaire developed by Eagleton (2015) (2). The original tool was translated into Vietnamese and culturally adjusted to fit the learning context of nursing students in Vietnam. The questionnaire consisted of two main sections:

Section 1: Demographic information, including gender (male/female), place of residence (urban/rural), and family economic status (normal/difficult).

Section 2: Learning satisfaction, comprising 19 items grouped into three domains: (1) *Perceived course learnability* (5 items): assesses students' confidence in understanding and applying anatomy knowledge; (2) *Learning community support* (5 items): evaluates the availability and effectiveness of support from peers and instructors; and (3) *Learning effectiveness* (9 items): measures students' perceived impact of anatomy learning on their study habits and confidence in understanding content, rather than actual grades or test results.

Each item was closed-ended with binary response options: "Yes" (1) or "No" (0). In this

study, the questionnaire was modified to fit the Vietnamese educational context while maintaining the original conceptual domains. One item in the learning community support domain asked students to indicate their preferred learning method (lecture-based or discussion-based) and was excluded from satisfaction scoring due to its focus on learning style rather than satisfaction. Results for each item were reported as the percentage of students who selected "Yes," reflecting agreement with that specific aspect of learning satisfaction. A total of 18 items were used to calculate satisfaction levels, based on Eagleton's (2015) three-component framework: perceived course learnability, learning community support, and perceived learning effectiveness. These items reflected students' agreement with specific aspects of their learning experience, including enjoyment, relevance, perceived preparedness, and self-directed learning behaviors. Notably, this study did not evaluate satisfaction based on actual academic performance or teaching method preferences. Instead, satisfaction was interpreted as students' subjective appraisal of their own engagement, confidence, and perceived support throughout the Anatomy course.

The Vietnamese version of the questionnaire was reviewed and appraised by a panel of experts in nursing education to ensure linguistic clarity and cultural relevance. A pilot test was conducted before official data collection. Psychometric assessment showed that the adapted instrument had strong content validity (Content Validity Index – CVI = 0.94) and acceptable internal consistency (Cronbach's alpha = 0.66).

Data collection

Data were collected in January 2023. Researchers introduced the study objectives and procedures to students during scheduled class breaks of another course in the same semester. A Google Form link was then shared via Zalo and posted in the class group. Students voluntarily accessed the link and completed the online questionnaire anonymously. Responses were recorded in Google Form and exported to Excel for further processing.

Data analysis

Data were analyzed using SPSS version 20.0. Descriptive statistics were used to summarize demographic characteristics and calculate the percentage of "Yes" responses for each satisfaction item. Satisfaction rates by domain were computed by dividing the total number of "Yes" responses by the total possible responses (number of items × number of participants). Associations between demographic variables and satisfaction levels were examined using Chi-square tests, with $p < 0.05$ considered statistically significant.

Ethical considerations

This study was approved by the Ethics Committee of Pham Ngoc Thach University of Medicine (Approval No. 532/TĐHYKPNT-HĐĐĐ). Participation was voluntary, and students were fully informed about the study objectives, procedures, and their rights before completing the online questionnaire. No personal identifiers were collected. All responses were kept confidential and used solely for research purposes.

III.RESULTS

Participant characteristics

A total of 132 first-year nursing students completed the survey.

Table 1. Demographic characteristics of study participants (n = 132)

Variable	n	%
Gender		
Female	114	86.4
Male	18	13.6
Place of Residence		
Rural	41	31.1
Urban	91	68.9
Economic Status*		
Perceived as financially stable	121	91.7
Perceived as economically difficult	11	8.3

*Note: *Students self-reported their family's economic status based on personal perception.*

Among 132 respondents, 86.4% were female and 13.6% were male. Most students lived in urban areas (68.9%), and only 8.3% reported financial difficulties.

Students' satisfaction

Perceived course learnability

Student perceptions of their ability to learn anatomy were assessed using five items adapted from the framework by Eagleton (2015) (2), who conceptualized perceived learnability as a key precursor to motivation and persistence in learning, consistent with Keller's principles of motivation (2008) (7). The items in this domain

reflected learners' sense of enjoyment, relevance, confidence, and self-perceived preparedness, which together form the basis of perceived course learnability. The proportion of students who responded "Yes" to each item is presented in Table 2.

Table 2. Student agreement with items on perceived course learnability (n = 132)

No.	Item	Yes n(%)	No n(%)
1	Interest in learning about the structure of the human body	129(97.7)	3(2.3)
2	Perceived relevance of anatomy to future nursing career	130(98.5)	2(1.5)
3	Belief in having the necessary knowledge and skills to become a good nurse	90(68.2)	42(31.8)
4	Perceived preparedness to make one's best effort to achieve the goal of becoming a nurse	124(93.9)	8(6.1)
5	Enjoyment of studying	126(95.5)	6(4.5)

As shown in Table 2, nearly all students agreed that they were interested in learning about the structure of the human body (97.7%) and perceived the relevance of anatomy to their future nursing careers (98.5%). These two items reflect what Eagleton (2015) identifies as curiosity and relevance, key elements in perceived learnability that stimulate motivation. A high proportion also reported feeling well prepared with the knowledge needed to become a nurse (93.9%) and enjoyed studying in general (95.5%). However, only 68.2% of students believed they possessed the necessary knowledge and skills to become a good nurse, indicating a potential gap between students' learning satisfaction and their perceived self-competence. This finding should be interpreted in light of the fact that Anatomy is a foundational subject, typically undertaken early in the nursing program, when most students have limited clinical exposure and may not yet be able to relate anatomical knowledge to real-world nursing practice.

Learning community support

This domain was assessed using four items (excluding the learning preference item). The percentage of students who selected "Yes" for each item is shown in Table 3.

Table 3. Student agreement with items on learning community support (n = 132)

No.	Item	Yes n(%)	No n(%)
1	Understanding content better through peer discussion	114(86.4)	18(13.6)
2	Enjoyment of laboratory sessions	126(95.5)	6(4.5)
3	Improved theoretical understanding through laboratory sessions	129(97.7)	3(2.3)
4	Desire for increased use of technology in teaching and learning	120(90.9)	12(9.1)
5	Learning method preference: lecture vs. discussion*	**Lecture**	**Discussion**
		104(78.8)	28(21.2)

**Note: This item is presented for reference only and was not included in the calculation of the Community Learning Support satisfaction score.*

The majority of students (86.4%) reported better understanding of content through peer discussion. Nearly all participants enjoyed laboratory sessions (95.5%) and subjectively perceived that these sessions enhanced their understanding of theoretical content (97.7%). This perception was based on students' self-assessed agreement with the item "Laboratory sessions helped me understand theory better," using a binary response format ("Yes" or "No"). The item reflected students' subjective judgment rather than objective academic outcomes. This approach aimed to capture their experiential perceptions of learning support in practice-based settings. Additionally, 90.9% of students expressed a desire for increased use of technology in teaching and learning. One item asked student to choose their preferred learning method. Results showed that 78.8% of students preferred lecture-based instruction, while 21.2% favored discussion-based approaches. Although 97.7% of students perceived that laboratory sessions improved their theoretical understanding and 86.4% reported better comprehension through peer discussion, only

21.2% preferred discussion-based methods. This apparent contradiction may reflect students' greater trust in expert-led instruction, as they may perceive lectures to provide more accurate or structured knowledge than discussions with peers, who are also novices.

Learning effectiveness

This domain consisted of nine items assessing how students engaged with and reinforced their anatomy learning. Perceptions of effectiveness were measured by students' binary agreement ("Yes" or "No") with statements such as "I achieved more than expected" and "I could relate previous and new content." These items were designed to capture students' subjective experiences of learning gains, integration of knowledge, and the use of learning resources beyond prescribed texts. The findings are presented in Table 4.

Table 4. Student agreement with items on learning effectiveness (n = 132)

No.	Item	Yes n(%)	No n(%)
1	Perceived learning gains beyond expectations	129(97.7)	3(2.3)
2	Ability to relate previous and new content	84(63.6)	48(36.4)
3	Use of additional materials or computer-based tools beyond prescribed textbooks	85(64.4)	47(35.6)
4	Seeking clarification from instructors when content is unclear	71(53.8)	61(46.2)
5	Seeking clarification from peers when content is unclear	120(90.9)	12(9.1)
6	Consulting the textbook independently when content is unclear	127(96.2)	5(3.8)
7	Visiting the library for additional resources when content is unclear	55(41.7)	77(58.3)
8	Searching online for additional information when content is unclear	129(97.7)	3(2.3)
9	Belief that test scores accurately reflect personal study efforts	103(78.0)	29(22.0)

These findings suggest that students actively engaged in a range of self-directed learning strategies to reinforce their anatomy understanding. Notably, 97.7% reported using the internet to seek clarification and 96.2% consulted textbooks when encountering difficulties, both practices that foster independent problem-solving. While these practices promote autonomy, they also raise questions about the accuracy and reliability of the information accessed, especially in the era of AI-assisted learning. Furthermore, 63.6% of students could relate previous knowledge to new content, and 97.7% reported learning gains beyond expectations. These results indicate that self-directed efforts, particularly through technology use and independent study, may have positively contributed to students' comprehension of anatomy.

Overall learning satisfaction

This composite indicator reflects students' overall satisfaction with the anatomy course, derived from their self-reported perceptions across 18 items spanning three key domains - Perceived course learnability, learning community support, and Learning effectiveness - as proposed in Eagleton's framework (2015). Responses were collected from 132 students.

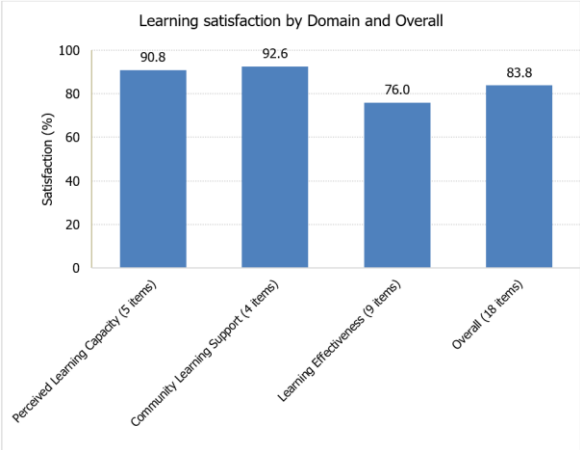

Figure 1. Learning satisfaction by domain and overall

Figure 1 illustrates the learning satisfaction rates across the three domains and overall,

based on 18 survey items. Students reported the highest satisfaction in learning community support (92.6%), followed closely by perceived course learnability (90.8%). In contrast, satisfaction with learning effectiveness was notably lower, at 76.0%. This may partly reflect limitations in the availability and accessibility of learning resources, including opportunities to consult with lecturers. When averaged across all 18 items, the overall satisfaction rate was 83.8%. These results suggest that while students felt supported by their peers and confident in their ability to learn anatomy, there were challenges related to applying and reinforcing learning effectively.

Associations between demographic factors and learning satisfaction

Table 5: Associations between demographic factors and learning satisfaction

Variable	Course learnability			Learning support			Learning effectiveness		
	Yes (n,%)	No (n,%)	*P*	Yes (n,%)	No (n,%)	p	Yes (n,%)	No (n,%)	p
Gender									
Female	108(94.7)	6(5.3)		101(88.6)	13(11.4)		62(54.4)	52(45.6)	
Male	16(88.9)	2(11.1)	0.334	12(66.7)	6(33.3)	**0.014**	10(55.6)	8(44.4)	0.926
Place of residence									
Rural	85(93.4)	6(6.6)		75(82.4)	16(17.6)		54(59.3)	37(40.7)	
Urban	39(95.1)	2(4.9)	0.702	38(92.7)	3(7.3)	0.120	18(43.9)	23(56.1)	0.099
Economic status									
Normal	113(93.4)	8(6.6)		102(93.4)	19(6.6)		66(54.5)	55(45.5)	
Difficult	11(100)	0(0.0)	0.379	11(100)	0(0.0)	0.155	6 (54.5)	5(45.5)	1.000

Gender was significantly associated with satisfaction in learning community support (p = 0.014), with female students reporting higher satisfaction than males. No significant associations were found between gender and other domains, or between satisfaction and students' residence or economic status (all p > 0.05).

IV. DISCUSSION

This study explored nursing students' satisfaction in learning Anatomy across three domains: Perceived course learnability, learning community support, and learning effectiveness. The overall satisfaction level (83.8%) was relatively high, indicating that most participants perceived a positive learning experience. However, the variation in satisfaction across domains reveals important areas for instructional improvement. High satisfaction with perceived course learnability (90.8%) indicates that most students found Anatomy relevant to their nursing career and enjoyed the subject, echoing Eagleton's findings (2015) that perceived learning relevance strongly contributes to satisfaction in foundational courses (2). Similarly, Mohamed and Lamia (2018) demonstrated that students who recognize the relevance of content to future practice are more engaged and satisfied with their studies (8). A Vietnamese study also found high student satisfaction after a simulation-based course and reported a positive link between satisfaction and self-confidence. Although focused on simulation rather than theoretical learning, it reinforces the role of structured and engaging educational experiences in enhancing student outcomes (4).

While this study did not objectively assess the effectiveness of teaching strategies, it focused on students' self-perceived learning experiences across key domains outlined in Eagleton's framework (2015) (2). The high score in learning community support (92.6%) suggests that students perceived peer collaboration and faculty support as meaningful contributors to their learning experience. Laboratory sessions were particularly valued, with 97.7% of students reporting improved understanding of theoretical content, reflecting the perceived benefit of structured and practical instruction. These findings are consistent with global trends that emphasize interactive and immersive learning in anatomy education. For instance, Jallad et al. (2024) found that virtual reality applications significantly enhanced anatomy knowledge and satisfaction (9). Similarly, 90.9% of students in the current study expressed a desire for

increased use of educational technology. Despite 97.7% acknowledging improved understanding through labs, the lower learning effectiveness scores may reflect students' continued reliance on passive habits and reluctance to engage in active methods like discussion or problem-based learning.

Learning effectiveness received the lowest agreement (76.0%), with particularly low engagement in help-seeking behaviors (53.8%) and use of library resources (41.7%). These results suggest a need to strengthen academic advising, encourage proactive engagement with faculty, and improve access to institutional learning resources. In addition, the growing use of online resources and AI-assisted tools in self-directed learning raises concerns about the accuracy, reliability, and timeliness of the information students rely on. While promoting independent learning is beneficial, educators should actively guide students in evaluating source credibility. Developing information literacy should therefore be considered a core component of foundational anatomy education to ensure that autonomy does not compromise the quality of knowledge acquisition. Moreover, students' perceived learning effectiveness may also depend on the availability, accessibility, and currency of learning resources, including timely access to lecturers for clarification and guidance. In relation to individual characteristics, Barmaki et al. (2024) observed similar gender differences in tool usage and suggested that tailored support could address these disparities (10). Future research should incorporate objective measures to evaluate the actual impact of these strategies beyond perceived satisfaction. Among demographic variables, gender was the only significant factor, with female students reporting higher satisfaction in learning community support ($p = 0.014$). This may reflect gender-based differences in communication patterns and social engagement, as supported by Cho and Kim (2023), who reported higher self-confidence and satisfaction levels among female nursing students in simulation-based environments (11). Other variables such as place of residence and economic status were not significantly associated with student satisfaction. This finding aligns with research by Fooladi et al. (2022), which highlighted that when academic environments provide adequate orientation, interactive teaching, and both formal and informal support, the impact of socioeconomic or geographic background on learning outcomes can be minimized (12). Although their study focused on performance rather than satisfaction, it reinforces the importance of institutional support in promoting positive student experiences regardless of individual background factors.

In the Vietnamese context, similar studies have focused primarily on clinical learning or overall satisfaction with educational programs, while few have investigated foundational science subjects like Anatomy. This gap is notable given the crucial role of Anatomy in shaping students' foundational knowledge and long-term professional competencies. While a local study by Bui Thi Huyen Vi (2022) focused on external factors influencing students' satisfaction, such as teaching quality and facilities (13), the present study contributes additional insight by exploring nursing students' self-perceived satisfaction specifically in the context of anatomy learning. Notably, students expressed strong interest in the integration of educational technologies. Although this study did not implement such interventions, the high desire (90.9%) for increased technology use suggests a significant opportunity to enhance learning satisfaction and engagement through immersive digital tools. This finding aligns with recent research by Chiu and Wei (2025), who found that virtual reality not only improved student satisfaction and learning motivation in anatomy courses, but also required careful consideration of learner comfort and delivery methods to optimize knowledge retention (14). Similarly, a study by Jallad et al. (2024) reported a 90.5% satisfaction rate among nursing students using immersive virtual reality platforms, along with statistically significant improvements in self-directed learning competencies ($p < 0.001$) (9). Future research and curriculum design efforts should explore cost-effective ways to integrate such technologies, especially in settings with limited resources. Although this study did not directly evaluate the application of extended reality (XR) tools, global evidence supports their potential impact in similar contexts. A recent meta-analysis by García-Robles (2024) confirmed that XR tools, encompassing both virtual and augmented reality, significantly enhanced anatomy learning outcomes (15). These findings reinforce the educational potential of XR,

especially when integrated as a supplement to conventional methods in resource-limited academic settings. The implications of this study extend beyond the local context. Strategies such as peer-assisted learning, accessible faculty mentorship, and adaptive digital platforms could be tailored to the needs of diverse learner populations. The insights from this research may inform international dialogues on improving anatomy education in similar socio-educational environments.

Although the study used self-reported perceptions to evaluate satisfaction, the high agreement rates on items such as enjoyment of learning, relevance of anatomy to nursing practice, and improved understanding through laboratory sessions suggest that students were most satisfied with aspects of content relevance, interactive learning environments, and the opportunity for independent study. These findings imply that teaching methods incorporating relevance to future careers and structured practical sessions (e.g., labs) were key contributors to student satisfaction. However, fewer students sought help from instructors or used library resources, highlighting areas for pedagogical improvement. These findings also suggest the importance of accommodating diverse learning styles. Students may benefit differently from structured lectures, hands-on lab sessions, peer interaction, or technology-enhanced methods. Recognizing these varied preferences can help educators design more inclusive and effective teaching strategies that enhance both satisfaction and learning outcomes.

This study has limitations. The use of convenience sampling and a relatively small sample size from a single institution may limit the generalizability of the findings. In addition, reliance on self-reported data may introduce response bias. Additionally, the study considered only a limited number of demographic variables. Other potentially influential factors such as age, prior academic performance, or previous learning experiences were not included, which may limit the depth of analysis regarding satisfaction differences. Moreover, the use of binary (Yes/No) response options may have limited the range of students' expressions of satisfaction. A Likert scale could have offered greater variability and nuance in their responses.

V. CONCLUSION

In conclusion, this study highlights nursing students' self-perceived satisfaction with Anatomy learning, with the highest scores in community support and the lowest in learning effectiveness. The findings suggest that while students value relevance and peer interaction, their help-seeking behaviors remain limited. Self-directed learning actions, such as using online resources and peer consultation, played an important role in enhancing understanding. Educators should strengthen active learning strategies, promote faculty-student interaction, and consider integrating educational technologies to improve perceived learning effectiveness. Furthermore, variations in students' preferences for learning methods suggest the importance of blended learning approaches, which allow different learning styles to be accommodated effectively. Institutions should also ensure the availability of adequate teaching and learning tools to support students' engagement and success in foundational courses.

ACKNOWLEDGMENTS:

The researchers appreciate all of the members who gave their time so graciously to participate in the study and any person who facilitated the work.

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