

PERCEIVED STUDENT SATISFACTION AND ACADEMIC PERFORMANCE OF PHARMACY STUDENTS UNDER FLEXIBLE LEARNING IN PANGASINAN

JERALDINE D. PIAPA CRUZ*¹ AND ANA FE B. REVILLA²

¹Natural Sciences Programmes, Saint Louis University, Baguio City, Philippines

²Saint Louis University, Baguio City, Philippines

Published online: 31 May 2026

To cite this article: PIAPA CRUZ, J. D. & REVILLA, A. F. B. (2026) Perceived student satisfaction and academic performance of pharmacy students under flexible learning in Pangasinan, *Malaysian Journal of Pharmaceutical Sciences*, 24(1): 41–57. <https://doi.org/10.21315/mjps2026.24.1.3>

To link to this article: <https://doi.org/10.21315/mjps2026.24.1.3>

ABSTRACT

This study aimed to evaluate the perceived level of satisfaction among pharmacy students under the flexible learning (FL) setup and examine its correlation with academic performance during the COVID-19 pandemic. Conducted among Level I to IV BS Pharmacy students enrolled in various universities across Pangasinan, the study explored satisfaction in five key areas; (1) student motivation, (2) course structure, (3) instructor knowledge, (4) technical factors and (5) environmental conditions. The study employed a quantitative descriptive correlational design. Data were collected from 575 pharmacy students using a self-developed structured survey questionnaire and underwent content validation using Aiken's V and reliability testing using Cronbach's α . The researchers used frequency and percentage to describe students' personal and technical profiles. Kruskal-Wallis H and Mann-Whitney U tests were applied to examine differences in satisfaction across demographic groups. Spearman's Rank Correlation was used to determine the relationship between perceived satisfaction and Grade Point Average (GPA). Results indicated a high level of satisfaction across all five factors. Clear learning instructions, instructor expertise, and reliable internet access were key contributors. First-year students reported higher satisfaction than those in advanced levels, with no significant differences by age or gender. A weak positive correlation was found between satisfaction and GPA. Based on the findings, the study recommends continued integration of flexible learning, with improved internet access, faculty training and structured course delivery. Instructors should use interactive methods and timely feedback, while students are encouraged to create conducive study environments and maximise technical resources.

Keywords: Student satisfaction, Flexible learning, COVID-19 pandemic, GPA, Pharmacy education

*Corresponding author: jeraldinepiapacruz@gmail.com; 2197402@slu.edu.ph

INTRODUCTION

The COVID-19 pandemic necessitated a global shift in education from traditional classrooms to distance learning modalities (Zheng 2020; World Health Organization [WHO] 2020a). In response, the Philippine Commission on Higher Education (CHED) mandated the implementation of flexible learning (FL), a pedagogical approach allowing flexibility in time, place and audience, in higher education institutions (CHED 2020). While student satisfaction is a crucial indicator of the success of educational programmes (Oliver and DeSarbo 1988; Mukhtar *et al.* 2015), findings on satisfaction with online and FL have been inconsistent. Some studies report satisfactory outcomes, often linked to pre-pandemic familiarity with digital tools (Sharma *et al.* 2020; Bawa'aneh 2021), while others report dissatisfaction, attributing it to the abruptness of the transition and student unfamiliarity (Yekefallah *et al.* 2021; Linh and Trang 2020). Notably, satisfaction levels appear to be higher in developed countries as compared to the developing nations (Abbasi *et al.* 2020), thereby highlighting a significant contextual gap. Furthermore, within the Philippine context, there is a scarcity of data, particularly for allied health science programmes like pharmacy, where hands-on laboratory components are essential and may be disproportionately affected by the shift to FL (Oducado and Soriano 2021).

Although factors such as student motivation, instructor characteristics, course design, technical support and the learning environment are known to influence satisfaction, they have not been collectively investigated among pharmacy students in the Philippines under the FL framework. Therefore, this study aimed to determine the level of satisfaction with FL among Bachelor of Science in Pharmacy students in Pangasinan, Philippines. Specifically, it aimed to:

1. assess pharmacy students' satisfaction with FL based on five key domains: (i) student motivation, (ii) instructor characteristics, (iii) course structure, (iv) technical factors and (v) environmental factors, and
2. determine the correlation between student satisfaction and academic performance (Grade Point Average [GPA]) during the 2nd semester of the academic year 2023–2024.

METHODOLOGY

Study Design

The study follows a quantitative descriptive correlational study design. This design was carefully selected to assess the level of satisfaction with FL and to find out the correlation between student satisfaction and academic performance (GPA).

Population and Samples of the Study

The study population consisted of all from first-year to fourth-year Bachelor of Science in Pharmacy students enrolled across five Higher Education Institutions in the Province of Pangasinan, Philippines, during the 2nd semester of the 2023–2024 academic year. The total population size was 764 students (see Table 1). As the population was finite, well-defined, and of a manageable size, a total population sampling approach was employed, wherein all eligible students were invited to participate (see Table 2).

Table 1: Inclusion and exclusion criteria.

Inclusion	Exclusion
Bachelor of Science in Pharmacy students enrolled in the 2nd semester of academic year 2023–2024	Student taking less than three units of major pharmacy subjects
Students enrolled under FL setup during the current semester	Those with no internet connectivity at the time the questionnaire will be administered via Google Forms
Regular and irregular students taking at least six units of major pharmacy subjects	Those who did not agree to participate in the study
Has agreed to participate in the study and signed the consent form	

Table 2: Number of participants per year level.

	Level I	Level II	Level III	Level IV	Total
School A	68	76	61	24	229
School B	10	16	13	16	55
School C	46	58	61	30	195
School D	90	30	35	35	190
School E	30	20	35	10	95
Total	244	200	205	115	764

Data Collection Instrument

Data were collected using a structured, self-administered online questionnaire created with Google Forms. A researcher-developed questionnaire was used, which underwent rigorous validity and reliability testing. Content validity was assessed by a panel of three expert researchers in the field. The Aiken's V coefficients for all questionnaire domains ranged from 0.92 to 0.99, well above the recommended threshold of 0.70, confirming "very valid" content for each construct. Furthermore, reliability was confirmed, with Cronbach's alpha for the subscales demonstrating acceptable to high internal consistency ($\alpha = 0.77$ to 0.93). The questionnaire was composed of two parts:

1. Socio-demographic and academic profile. This section captured information on the respondents' age, gender, year level and self-reported cumulative GPA.
2. Student satisfaction and influencing factors. This section assessed students' satisfaction with the FL setup and the degree to which five key factors influenced their experience: (i) student motivation, (ii) instructor characteristics, (iii) course structure, (iv) technical factors and (v) environmental factors. All items in this section were measured using a 5-point Likert scale ranging from 1 "Strongly Disagree" to 5 "Strongly Agree" (see Table 3).

Table 3: 5-point Likert scale.

Scale	Range	Interpretation
5	4.21–5.00	Very satisfied
4	3.41–4.20	Satisfied
3	2.61–3.40	Neutral
2	1.81–2.60	Dissatisfied
1	1.00–1.80	Very dissatisfied

Data Collection Procedure

Ethical approval was first obtained from the Saint Louis University Ethics and Research Committee (SLU-ERC). Permission to conduct the study was then sought from the deans and programme heads of the participating colleges and universities. Upon receiving approval, the data gathering procedure began and the final survey link was distributed to the students through a designated Google Classroom of Level I, II, III and IV pharmacy students per school. Printed leaflets with QR codes linking to the questionnaire were also distributed as alternative way to access the Google Form links. The first page of the online survey contained a detailed informed consent form; participants were required to provide digital consent before proceeding. The data gathering was conducted during the second semester of the academic year 2023–2024.

Data Analysis

The data collected were analysed using the IBM Statistical Package for the Social Sciences (SPSS) version 26.0. Descriptive statistics such as frequencies, percentages, median and standard deviation were used to summarise the socio-demographic profiles and the students’ satisfaction scores. Inferential statistics were employed to test relationships and differences. The Kruskal-Wallis H test was used to determine differences in satisfaction scores across year levels, while the Mann-Whitney U test was used for binary categories (e.g., gender). The Spearman’s rank-order correlation was used to assess the relationship between student satisfaction and GPA. A *p*-value of less than 0.001 was considered statistically significant.

Ethical Considerations

This study was conducted in accordance with the ethical principles outlined in the declaration of Helsinki. Ethical approval was obtained from SLU-ERC. Participation was entirely voluntary, and informed consent was secured from all participants before their involvement. Anonymity and confidentiality were maintained throughout the study and collected data was stored in the researcher’s password protected computer and was used for the sole purpose of the study and will be removed once the study is finished.

RESULTS

Socio-demographic Profile

A total of 764 pharmacy students were invited to participate in the study, and 575 students completed the electronic survey questionnaire yielding a response rate of 75.26%. The socio-demographic and academic characteristics of the respondents are summarised in Table 4 and their socio-demographic technical profile are summarised in Table 5. The sample was predominantly female (67.5%) with the majority aged 20 to 21 years old (42.3%) and consisted of first-year (31.1%), second-year (29%), third-year (27.5%) and fourth-year (12.3%) students. The majority of the participants reported a GPA in the range of 90 to 94 (31.5%). In terms of technical profile, majority of the students are utilising their mobile phones (85.4%) for completion of their academic activities. Their internet connectivity was predominantly achieved via personal Wi-Fi (55.7%) with an internet speed of 40 Mbps or higher (29.9%).

Table 4: Socio-demographic personal profile of pharmacy students.

Profile	Group	Frequency	%
Age	16–17 y/o	4	0.7
	18–19 y/o	208	36.2
	20–21 y/o	243	42.3
	22–23 y/o	86	15.0
	24 y/o and above	34	5.9
	Total	575	100.0
Sex	Male	187	32.5
	Female	388	67.5
	Total	575	100.0
Year level	1st year	179	31.1
	2nd year	167	29.0
	3rd year	158	27.5
	4th year	71	12.3
	Total	575	100.0
GPA	95–100	39	6.8
	90–94	181	31.5
	85–89	129	22.4
	80–84	126	21.9
	75–79	96	16.7
	74 and below	4	0.7
	Total	575	100.0

Table 5: Socio-demographic technical profile of pharmacy students.

Profile	Group	Frequency	%
Availability of devices	Cellphone	491	85.4
	Tablet	174	30.3
	Desktop / Laptop	369	64.2
	None	1	0.2
	Others	0	0.0
Internet connectivity	Mobile data (owned)	127	22.1
	Mobile data (provided by school)	49	8.5
	Wi-Fi (owned)	320	55.7
	Wi-Fi (owned by others)	79	13.7
	Others	0	0.0
Internet speed	40 Mbps or higher	172	29.9
	26–35 Mbps	119	20.7
	16–25 Mbps	128	22.3
	6–15 Mbps	105	18.3
	1–5 Mbps	40	7.0
	Less than 1 Mbps	8	1.4
	No internet access	3	0.5

Note: Respondents were allowed to select multiple options.

Perceived Level of Satisfaction of the Pharmacy Students on FL

The descriptive statistics for student satisfaction and the key influencing factors are presented in Table 6, 7, 8, 9 and 10. The overall perceived level of satisfaction with FL was generally “High” (mean [M] = 3.71; SD = 1.16). Among the five domains, the highest levels of satisfaction were reported for technical factors and environmental factors (tied at M = 3.84; SD = 1.12). The lowest level of satisfaction was with student motivation (M = 3.64; SD = 1.22).

The perceived satisfaction with FL in terms of student motivation was rated “High” (M = 3.64; SD = 1.22). Students were particularly motivated by clear learning material instructions (M = 3.97), while internet reliability (M = 3.36) and comfort at home (M = 3.39) scored moderately. In terms of course structure, the participants rated their satisfaction with course structure as “High” (M = 3.57; SD = 1.17). Both lecture and laboratory courses were well-received, with organised materials, clear instructions and relevant activities contributing to satisfaction. Laboratory activities, particularly those aiding understanding of pharmacy concepts, stood out (M = 3.90), reflecting effective practical integration within FL. In terms of instructors’ knowledge, students expressed “High” satisfaction with their instructors’ knowledge (M = 3.67; SD = 1.17). Comprehensive knowledge, professionalism and utilisation of various communication techniques were noted as strong points. However, punctuality and timely feedback to concerns scored slightly lower (M = 3.60), suggesting an area for improvement in instructor-student engagement. With regards to technical factors, satisfaction rating for this category was classified as “High” (M = 3.84; SD = 1.12), indicating that, on the whole, students were relatively content with the technical aspects

of their learning environment. However, while some students felt confident using the essential applications required for FL (weighted mean [WM] = 3.75), certain external challenges were identified that negatively affected their overall satisfaction. Lastly, in terms of environmental factors, the pharmacy students rated it as "High" with overall (M = 3.84; SD = 1.12), with temperature-related aspects receiving the highest score (M = 4.08). Secondary to which, students scored high in noise-related factors which affects their concentration (M = 3.00) and satisfaction (M = 3.89) in doing school related activities. Meanwhile, the results have also shown how the brightness of light available in students' study areas contributes to their level of concentration and focus when doing school works (M = 3.79).

Table 6: Perceived level of satisfaction of the pharmacy students on flexible learning in terms of student motivation.

Indicators	WM	M	SD	VI
The students are inspired to attend their classes and learn from their instructors during synchronous classes	3.53	4.00	1.25	High
The students are encouraged to attend and participate in class knowing that their friends are attending the class too	3.87	4.00	1.11	High
The amount of support coming from the family/friends influences the students to attend classes regularly	3.88	4.00	1.08	High
The teaching method of the instructors inspires the students to attend classes often	3.51	4.00	1.35	High
The students are excited to do their activities if the learning materials are provided with clear instructions	3.97	4.00	1.03	High
The students encourage themselves to study and turn in my activities on time	3.65	4.00	1.16	High
The students are inspired to attend class knowing that they have a reliable internet connectivity at home	3.36	4.00	1.35	Moderate
The students are motivated to attend and participate in class because it is comfortable to do it at home	3.39	3.00	1.26	Moderate
Overall	3.64	4.00	1.22	High

Note: WM = weighted mean; M = mean; SD = standard Ddeviation; VI = verbal interpretation.

Table 7: Perceived level of satisfaction of the pharmacy students on flexible learning in terms of course structure.

Indicators	WM	M	SD	VI
For Lecture Subjects				
The course syllabi are presented and explained to class at the beginning of the semester	3.69	4.00	1.21	High
The lesson objectives are presented to class before lecture/session starts	3.77	4.00	1.17	High
The topics are presented to class in an orderly manner and is easy to follow	3.75	4.00	1.14	High

(continued on next page)

Table 7: (Continued)

Indicators	WM	M	SD	VI
The course materials/lectures are provided to students and are accessible whenever needed	3.48	4.00	1.27	High
The instructions are clearly presented to class before executing any class activity	3.77	4.00	1.12	High
The activities and assignments given have justifiable scheduled deadline	3.42	4.00	1.28	High
For Laboratory Subjects				
The verbal instruction given during the laboratory time was clear and understandable	3.64	4.00	1.15	High
The written laboratory manual was organised and easy to understand	3.73	4.00	1.09	High
Pre-lab and post-lab discussions are executed before and after activities are conducted	3.75	4.00	1.06	High
Simulation videos or thorough explanation are given by the instructor to ensure that the activity is correctly executed	3.49	4.00	1.21	High
Demonstration on the use of laboratory equipment/materials are provided by the instructor whenever deemed necessary	3.45	4.00	1.23	High
The laboratory activities conducted are helpful in understanding the pharmacy concepts taught in the lecture part	3.90	4.00	0.98	High
Overall	3.57	4.00	1.17	High

Table 8: Perceived level of satisfaction of the pharmacy students on flexible learning in terms of instructors' knowledge.

Indicators	WM	M	SD	VI
The instructors are punctual in starting the class on time	3.57	4.00	1.22	High
The instructors provide clear instructions during class orientation and before doing class activities	3.70	4.00	1.17	High
The instructors utilise various communication techniques to reach out to students (e.g. Facebook Messenger, Google Meet, email etc.)	3.79	4.00	1.22	High
The instructors exhibit a comprehensive knowledge about the subject content	3.87	4.00	1.05	High
The instructors exhibit professionalism in class	3.85	4.00	1.17	High
The instructors provide timely responses/feedbacks to student concerns	3.60	4.00	1.21	High
The instructors always make an effort to make the class free from distractions	3.71	4.00	1.13	High
The instructors make the subject and the discussion as interesting as possible	3.77	4.00	1.15	High
Overall	3.67	4.00	1.17	High

Table 9: Perceived level of satisfaction of the pharmacy students on flexible learning in terms of technical factors.

Indicators	WM	M	SD	VI
The students are confident that they possess technical skills in using the applications needed for the FL setup (Microsoft Office apps, Google Meet, Facebook Messenger, Google Classroom)	3.75	4.00	1.20	High
The applications used in the FL setup are user-friendly and easily to learn	3.61	4.00	1.37	High
The lecture/videos and other graphic materials provided are comfortable to watch/look at	3.57	4.00	1.18	High
The internet connectivity at home affects my learning opportunity during synchronous classes	4.10	4.00	0.90	High
Unannounced power interruptions or loss of internet connectivity hinders my learning process during class	4.07	4.00	0.93	High
The lack of device or properly working devices hinders me from doing my activities and submitting them on-time	3.95	4.00	0.97	High
Overall	3.84	4.00	1.12	High

Table 10: Perceived level of satisfaction of the pharmacy students on flexible learning in terms of environmental factors.

Indicators	WM	M	SD	VI
Lighting				
There is an adequate level of lighting in my study area	3.58	4.00	1.15	High
The brightness of light available in my study area helps me concentrate and focus on the school works I'm doing	3.79	4.00	1.15	High
The lighting coming from my device (computer/tablet/mobile phone) is comfortable to the eyes	3.14	3.00	1.29	Moderate
The lighting in my study area can be adjusted according to the amount of light I need for studying (eg. use of blinds, lamp shade, adjustable LED lights)	3.37	4.00	1.25	High
Noise				
The amount of noise that can be heard in the study area is tolerable when studying	3.26	3.00	1.17	Moderate
The amount of noise affects my concentration and focus and hinders me from doing my school related activities properly	3.99	4.00	1.02	High
The amount of noise affects my satisfaction in doing school related activities	3.89	4.00	1.12	High

(continued on next page)

Table 10: (Continued)

Indicators	WM	M	SD	VI
Temperature				
The area designated at home for studying is well-ventilated	3.51	4.00	1.16	High
Working in a comfortable temperature helps me do my school activities comfortably/properly	4.08	4.00	1.01	High
The temperature within the study area can easily be modified and make it conducive for studying	3.45	4.00	1.24	High
Overall	3.84	4.00	1.12	High

Differences on the Perceived Satisfaction on FL Among Students

Differences in the five satisfaction domains based on demographic variable such as age, gender and year level were analysed using Kruskal-Wallis and Mann-Whitney U Tests. Kruskal-Wallis H tests revealed statistically significant differences in satisfaction scores across age groups for all domains except environmental factor (see Table 11): student motivation (Kruskal-Wallis test statistic with 4 degrees of freedom [H(4)] = 37.20; $p < 0.001$), course structure (H[4] = 43.07; $p < 0.001$), instructor knowledge (H[4] = 36.38; $p < 0.001$) and technical factors (H[4] = 29.73; $p < 0.001$). For the four out of five domains, the age group 18 to 19 years old had the highest mean rank (mean rank ranging from 332.93 to 346.02), indicating a consistent pattern where the youngest respondents reported the highest levels of satisfaction. However, specific pairwise comparisons between age groups were not conducted.

Table 11: Differences on the perceived satisfaction on flexible learning among the students by age.

Variable	Group	Mean rank	Kruskal-Wallis H	Interpretation
Student motivation	16–17 y/o	300.38	37.202	Significant
	18–19 y/o	342.02		
	20–21 y/o	254.67		
	22–23 y/o	247.12		
	24 y/o and above	297.68		
Course structure	16–17 y/o	331.50	43.074	Significant
	18–19 y/o	346.02		
	20–21 y/o	250.57		
	22–23 y/o	247.99		
	24 y/o and above	296.65		
Instructor knowledge	16–17 y/o	320.88	36.378	Significant
	18–19 y/o	341.99		
	20–21 y/o	254.33		
	22–23 y/o	251.47		
	24 y/o and above	286.96		

(continued on next page)

Table 11: (Continued)

Variable	Group	Mean rank	Kruskal-Wallis H	Interpretation
Technical factors	16–17 y/o	274.75	29.727	Significant
	18–19 y/o	332.93		
	20–21 y/o	248.25		
	22–23 y/o	285.08		
	24 y/o and above	306.21		
Environmental factors	16–17 y/o	205.38	49.915	Significant
	18–19 y/o	344.02		
	20–21 y/o	243.00		
	22–23 y/o	258.97		
	24 y/o and above	350.06		

Note: *p*-value tested at 0.001.

As for the differences in satisfaction scores across year levels for all five domains, a consistent and clear pattern emerged from the mean ranks (see Table 12): first-year students reported significantly higher satisfaction than their senior counterparts across all aspects of FL, including student motivation ($H[3] = 71.77$; $p < 0.001$), course structure (Kruskal-Wallis test statistic with 3 degrees of freedom [$H(3)$] = 79.28; $p < 0.001$), instructor knowledge ($H[3] = 72.78$; $p < 0.001$), technical factors ($H[3] = 49.85$; $p < 0.001$) and environmental factors ($H[3] = 58.74$; $p < 0.001$).

Table 12: Differences on the perceived satisfaction on flexible learning among the students by year level.

Variable	Group	Mean rank	Kruskal-Wallis H	Interpretation
Student motivation	1st year	345.65	71.765	Significant
	2nd year	324.01		
	3rd year	216.03		
	4th year	218.13		
Course structure	1st year	353.23	79.275	Significant
	2nd year	319.70		
	3rd year	214.58		
	4th year	212.35		
Instructor knowledge	1st year	349.85	72.781	Significant
	2nd year	318.89		
	3rd year	221.15		
	4th year	208.18		

(continued on next page)

Table 12: (Continued)

Variable	Group	Mean rank	Kruskal-Wallis H	Interpretation
Technical factors	1st year	348.78	49.848	Significant
	2nd year	297.51		
	3rd year	228.24		
	4th year	245.40		
Environmental factors	1st year	351.21	58.744	Significant
	2nd year	302.54		
	3rd year	218.71		
	4th year	248.64		

Note: *p*-value tested at 0.001.

While satisfaction levels differed significantly by age and year level, a Mann-Whitney U test found no statistically significant differences in perceived satisfaction between male and female students across any of the five domains (see Table 13): student motivation (Mann–Whitney U test [U] = 33,979.00; p = 0.217), course structure (U = 33,997.00; p = 0.222), instructor knowledge (U = 33,403.50; p = 0.123), technical factors (U = 34,096.50; p = 0.241) and environmental factors (U = 35,918.00; p = 0.847).

Table 13: Differences on the perceived satisfaction on flexible learning among the students by gender.

Variable	Group	Mean rank	Mann-Whitney U	Interpretation
Student motivation	Male	275.71	33,979.00	Not Significant
	Female	293.93		
Course structure	Male	275.80	33,997.00	Not Significant
	Female	293.88		
Instructor knowledge	Male	272.63	33,403.50	Not Significant
	Female	295.41		
Technical factors	Male	276.33	34,096.50	Not Significant
	Female	293.62		
Environmental factors	Male	286.07	35,918.00	Not Significant
	Female	288.93		

Note: *p*-value tested at 0.001.

Correlation Between the Perceived Level of Satisfaction and the GPA of the Pharmacy Students

To address the relationship between academic performance and student satisfaction, a Spearman's rank-order correlation was run to determine the relationship between the five satisfaction domains and the GPA of pharmacy students. Analysis revealed a consistent pattern of statistically significant, moderate positive correlations between all satisfaction domains and GPA (all p = < 0.001). As shown in Table 14, the correlations ranged from

$\rho = 0.395$ for technical factors to $\rho = 0.468$ for course structure, indicating that as student satisfaction in any of these domains increases, the GPA also tends to increase.

Table 14: Correlation between the perceived level of satisfaction and the grade point average of the pharmacy students.

Outcome variable	Predictor variable	Correlation coefficient (ρ)	Strength of correlation	Interpretation
Student motivation	Grade Point Average (GPA)	0.465	Moderate	Significant
Course structure		0.468	Moderate	Significant
Instructor knowledge		0.456	Moderate	Significant
Technical factors		0.395	Moderate	Significant
Environmental factors		0.449	Moderate	Significant

Note: p -value tested at 0.001.

DISCUSSIONS

Summary of Key Findings

The primary purpose of this study was to determine the perceived level of satisfaction of pharmacy students enrolled under FL setup in terms of various factors such as student motivation, course structure, instructor knowledge, technical factors and environmental factors and identify whether there is a correlation between the perceived level of satisfaction and GPA of the pharmacy students who were surveyed. The findings revealed a moderate overall level of satisfaction, with instructor knowledge and environmental factors being the most positive aspects, and technical factors the least. A consistent and notable pattern emerged where satisfaction was significantly higher among younger and first-year students compared to their senior counterparts. Furthermore, all domains of satisfaction demonstrated a significant, moderate positive correlation with academic performance (GPA).

Interpretation of Results

The analysis revealed a clear demographic pattern: satisfaction was consistently and significantly higher among the youngest students (from aged 18 to 19, predominantly first-years) across the domains of student motivation, course structure, instructor knowledge and technical factors. This can be interpreted as a function of academic stage and prior experience. First-year students, often fresh from the structured environment of senior high school, may approach FL with a sense of novelty and optimism. Their primary focus is on foundational knowledge and pedagogical support, making them more receptive to and satisfied with the instructor's expertise and the course's structural framework, a finding that aligns with Morrison and Evans (2018), who noted freshmen prioritise teaching quality that fosters learning. Furthermore, their heightened satisfaction with technical factors suggests they may view new learning platforms as an engaging challenge rather than a hurdle, driven by a motivation to master the tools of their new academic environment, which correlates with the positive link between freshman motivation and achievement identified by Hammad *et al.* (2020).

In contrast, senior students, who are closer to entering the profession, possess a clearer understanding of the practical, hands-on competencies required of a pharmacist. This likely leads them to perceive the limitations of a remote learning model more acutely. This finding directly aligns with the concerns raised by Oducado and Soriano (2021) regarding the specific challenges FL poses for developing clinical and practical skills in allied health education. The significantly lower satisfaction among seniors underscores a “readiness gap”, where the FL setup is perceived as inadequate for preparing them for the practical demands of their profession. Finally, the singular domain where older students (24 years old and above) expressed higher satisfaction—environmental factors—highlights a different reality. These students, often balancing studies with work or family, possess the life experience and resources to curate an effective personal learning space, underscoring how maturity and external responsibilities refocus satisfaction from institutional provisions to personal control over one’s learning environment.

Furthermore, this study provides robust evidence that academic performance is not an isolated outcome but is deeply embedded within a supportive learning ecosystem. We found consistent, moderate positive correlations between GPA and all five satisfaction domains, from internal drive (student motivation) to external structures (course structure, instructor knowledge, technical factors and environmental factors). This finding significantly expands on the work of Siang and Santoso (2016), who identified motivation as a key driver, by demonstrating that academic success is contingent upon the entire educational environment. The link between motivation and GPA is well-established, with highly motivated students investing greater effort and employing proactive learning strategies (El-Sayad, Md Saad and Thurasamy 2021), a trend particularly strong among those with clear career goals (Arain *et al.* 2022). However, our results show that this internal drive is powerfully mediated by external factors. A well-structured course provides the clarity and framework necessary for effective learning, directly facilitating better academic outcomes (Lucas *et al.* 2024; Terry *et al.* 2017). Similarly, instructor knowledge is a cornerstone of this ecosystem; when students perceive their instructors as experts, it builds confidence in the learning process, which in turn supports academic achievement (Arain *et al.* 2022).

Crucially, this ecosystem extends into the student’s physical and digital space. Reliable technology is not a mere convenience but a fundamental prerequisite for engagement; poor connectivity directly undermines satisfaction and impedes performance (Dong 2024; AlHariri and AlHattami 2016). Finally, the often-overlooked physical environment, including temperature, lighting and noise has a documented, measurable impact on cognitive functions like concentration and anxiety, thereby influencing exam performance and overall academic success (Lucas *et al.* 2024; Juan and Chen 2022). All in all, these correlations suggest that improving pharmacy student GPA is not solely about demanding more from the student, but about strategically enhancing the multi-faceted learning environment that surrounds them.

Lastly, in contrast to other demographic variables, the analysis revealed no statistically significant differences in satisfaction levels between male and female students across any of the five domains, including student motivation ($U = 33,979.00$; $p = .217$), course structure ($U = 33,997.00$; $p = 0.222$), instructor knowledge ($U = 33,403.50$; $p = 0.123$), technical factors ($U = 34,096.50$; $p = 0.241$) and environmental factors ($U = 35,918.00$; $p = 0.847$). This consistent pattern indicates that the perceived challenges and benefits of the FL model were experienced similarly, regardless of gender.

Limitations

Several limitations must be considered when interpreting these results. First, the use of a cross-sectional design prevents the establishment of causal relationships. Second, the reliance on self-reported GPA may be subject to bias. Finally, the study was conducted within a single province in the Philippines (Province of Pangasinan), which may affect the generalisability of the findings to other cultural or geographical contexts.

CONCLUSIONS

This study demonstrates that pharmacy students' satisfaction and academic success in a FL environment are not isolated outcomes but are deeply embedded within a holistic learning ecosystem and significantly influenced by academic progression. The consistent, positive correlation between all satisfaction domains and GPA provides compelling evidence that the entire educational environment, from student motivation and instructor knowledge to technical factors and environmental factors are directly linked to academic performance.

However, a clear "readiness gap" exists, with first-year students reporting significantly higher satisfaction than their senior counterparts, for whom the remote model may inadequately support the development of essential practical skills. Therefore, to enhance both satisfaction and GPA, institutions must move beyond a one-size-fits-all model. This necessitates targeted support for senior students to bridge the practical skills gap, coupled with strategic investments in faculty development, robust technical infrastructure and guidance on optimising learning environments. These efforts are not merely supportive but are fundamental to achieving academic excellence and ensuring FL fulfils its promise in post-pandemic pharmacy education.

REFERENCES

- ABBASI, M. S., AHMED, N., SAJJAD, B., ALSHARANI, A. *et al.* (2020) E-Learning perception and satisfaction among health sciences students amid the COVID-19 pandemic, *Work*, 67(3): 1–8. <https://doi.org/10.3233/wor-203308>
- ALHARIRI, M. T. & ALHATTAMI, A. A. (2016) Impact of students' use of technology on their learning achievements in physiology courses at the University of Dammam, *Journal of Taibah University Medical Sciences*, 12(1): 82–85. <https://doi.org/10.1016/j.jtumed.2016.07.004>
- ARAIN, S. A., ALI, M., ARBILI, L., IKRAM, M. F. *et al.* (2022) Medical students and faculty perceptions about online learning during COVID-19 pandemic: Alfaisal University Experience, *Frontiers in Public Health*, 10: 880835. <https://doi.org/10.3389/fpubh.2022.880835>
- BAWA'ANEH, M. S. (2021). Distance learning during COVID-19 pandemic in UAE public schools: Student satisfaction, attitudes and challenges, *Contemporary Educational Technology*, 13(3): ep304. <https://doi.org/10.30935/cedtech/10872>

COMMISSION ON HIGHER EDUCATION (CHED). (2020). Guidelines on the implementation of Flexible Learning, [https://ched.gov.ph/wp-content/uploads/CMO-No.-4-s.-2020-Guidelines-on-the-Implementation-of-Flexible Learning.pdf?fbclid=IwAR0TM1Jt2KhxiwfPNOYI5OF3XQ0LAVamj7aLNvzHnd4SHMe1757ct2JPIWo](https://ched.gov.ph/wp-content/uploads/CMO-No.-4-s.-2020-Guidelines-on-the-Implementation-of-Flexible-Learning.pdf?fbclid=IwAR0TM1Jt2KhxiwfPNOYI5OF3XQ0LAVamj7aLNvzHnd4SHMe1757ct2JPIWo) (Accessed on 12 August 2024)

DONG, S. (2024). The effects of course modality on student satisfaction and academic outcomes at a liberal arts college during the COVID-19 pandemic, *Journal of Postsecondary Student Success*, 3(3): 110–134. https://doi.org/10.33009/fsop_jpss134781

EL-SAYAD, G., MD SAAD, N. H. & THURASAMY, R. (2021) How higher education students in Egypt perceived online learning engagement and satisfaction during the COVID-19 pandemic, *Journal of Computers in Education*, 8: 527–550. <https://doi.org/10.1007/s40692-021-00191-y>

HAMMAD, S., GRAHAM, T., DIMITRIADIS, C. & TAYLOR, A. (2020) Effects of a successful mathematics classroom framework on students' mathematics self-efficacy, motivation, and achievement: A case study with freshmen students at a university foundation programme in Kuwait, *International Journal of Mathematical Education in Science and Technology*, 53(6): 1502–1527. <https://doi.org/10.1080/0020739X.2020.1831091>

JUAN, Y.-K. & CHEN, Y. (2022) The influence of indoor environmental factors on learning: An experiment combining physiological and psychological measurements, *Building and Environment*, 221: 109299. <https://doi.org/10.1016/j.buildenv.2022.109299>

LINH, P. D. & TRANG, T. N. (2020) Pandemic, social distancing, and social work education: students' satisfaction with online education in Vietnam, *Social Work Education*, 39(8): 1074–1083. <https://doi.org/10.1080/02615479.2020.1823365>

LUCAS, R. E. C., DA SILVA, L. B., DE SOUZA, E. L., LEITE, W. K. *et al.* (2024) Influence of environmental variables on students' cognitive performance in indoor higher education environments, *WORK*, 79(1): 351–360. <https://doi.org/10.3233/WOR-220055>

MORRISON, B. & EVANS, S. (2018) University students' conceptions of the good teacher: A Hong Kong perspective, *Journal of Further and Higher Education*, 42(3): 352–365. <https://doi.org/10.1080/0309877X.2016.1261096>

MUKHTAR, U., ANWAR, S., AHMED, U. & BALOCH, M. A. (2015) Factors effecting the service quality of public and private sector universities comparatively: An empirical investigation, *Arts, Science & Commerce*, 6(3): 132–142.

ODUCADO, R. M. & SORIANO, G. (2021) Shifting the education paradigm amid the COVID-19 pandemic: Nursing students' attitude to E-learning, *Africa Journal of Nursing and Midwifery*, 23(1): 2021. <https://doi.org/10.25159/2520-5293/8090>

OLIVER, R. L. & DESARBO, W. S. (1988) Response determinants in satisfaction, *Judgments The Journal of Consumer Research*, 14(4): 495–507. <https://doi.org/10.1086/209131>

SHARMA, K., DEO, G., TIMALSINA, S., JOSHI, A. *et al.* (2020) Online learning in the face of COVID-19 Pandemic: Assessment of students' satisfaction at Chitwan Medical College, Nepal, *Kathmandu University Medical Journal: COVID-19 Special Issue*, 70(2):40–47. <https://doi.org/10.3126/kumj.v18i2.32943>

SIANG, J. J. & SANTOSO, H. B. (2016) Learning motivation and study engagement: Do they correlate with GPA? An evidence from Indonesian university, *Researchers World*, 7(1): 111. [https://doi.org/10.18843/rwjasc/v7i1\(1\)/12](https://doi.org/10.18843/rwjasc/v7i1(1)/12)

TERRY, C. B., HEITNER, K. L., MILLER, L. A. & HOLLIS, C. (2017) Predictive relationships between students' evaluation ratings and course satisfaction in a college of pharmacy, *American Journal of Pharmaceutical Education*, 81(3): 53. <https://doi.org/10.5688/ajpe.81353>

WORLD HEALTH ORGANIZATION (2020a). Health topic: There is current outbreak of Coronavirus (COVID-19) disease.

WORLD HEALTH ORGANIZATION. (2020b). COVID-19 in the Philippines. <https://www.who.int/philippines/emergencies/covid-19-response-in-the-philippines?fbclid=IwAR0Gp4T20aI9p97BzSS3k6ER8aYxbSvPQfxBoDkk300wr1f4Lw-iJd0Wusg>

YEKEFALLAH, L., NAMDAR, P., PANAHI, R. & DEHGHANKAR, L. (2021) Factors related to students' satisfaction with holding e-learning during the COVID-19 pandemic based on the dimensions of e-learning, *Heliyon*, 7(7): e07628. <https://doi.org/10.1016/j.heliyon.2021.e07628>

ZHENG, J. (2020) SARS-CoV-2: An emerging coronavirus that causes a global threat, *International Journal of Biological Sciences*, 16(10): 1678–1685. <https://doi.org/10.7150/ijbs.45053>