

WHAT MAKES GOOD SUPERVISION? INSIGHTS FROM UNDERGRADUATE FINAL YEAR PROJECTS

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Abstract. Academic supervision is a critical component of undergraduate final-year projects (FYPs), shaping students' learning experiences and research outcomes. This study examined students' experiences and perceptions of the supervisory process, supervisors' roles, and factors influencing effective FYP supervision. A cross-sectional survey was conducted among 105 final semester Diploma in Pharmacy students enrolled in the Research Project course at Universiti Teknologi MARA (UiTM), Cawangan Pulau Pinang, Kampus Bertam, using a self-administered questionnaire distributed via Google Forms. The instrument assessed demographics, perceptions of the supervisory process, supervisors' roles, and influencing factors, with data analysed using descriptive statistics and thematic analysis. Results showed generally positive supervision experiences, with students agreeing that supervisors listened to and respected their ideas (mean = 4.25), were approachable (mean = 4.18), and provided constructive feedback (mean = 4.18). Professional conduct and clear guidance on FYP requirements were the most valued supervisory roles, with selected gender differences observed ($p < 0.05$). Timely feedback, regular meetings, and project duration were the most influential factors, while supervisor gender was least important. Despite satisfaction levels exceeding 75%, challenges related to time management, data collection, and communication remained. Overall, effective FYP supervision requires structured guidance, regular interaction, and timely feedback to enhance undergraduate research outcomes.

Keywords: *academic supervision, final year project, higher education, student perception, undergraduate research*

Introduction

Academic supervision is a cornerstone of higher education, particularly in supporting students engaged in undergraduate final year projects (FYPs). It encompasses a range of mentoring, guidance, and support mechanisms designed to develop students' academic and research competencies (Paulina et al., 2023; Hayani, 2022). Within the undergraduate context, supervision establishes a pedagogical relationship through which supervisors guide students in navigating the research process, ensuring timely project completion, and facilitating students' gradual integration into the scholarly community (Hayani, 2022; Sá et al., 2021). The supervisory process plays a pivotal role in shaping students' academic experiences and research outcomes. Effective supervision has been shown to enhance students' research skills, promote critical thinking and autonomy, and support successful project execution (Katowa-Mukwato, 2023; Razali et al., 2020). For undergraduate students, who often have limited prior research exposure, structured supervision is particularly important in helping them manage research scope, methodology, and timelines while transitioning towards greater academic independence.

Supervisors assume multifaceted roles that extend beyond academic advising to include mentorship, administrative facilitation, and coordination of research activities (Althubaiti and Althubaiti, 2022; Roberts and Seaman, 2018). These roles involve providing clear guidance, constructive feedback, and ongoing support while maintaining an appropriate balance between directive and facilitative approaches. Alignment between supervisors' expertise and students' research interests has also been identified as a key factor contributing to positive supervisory experiences and improved research outcomes (Falah and Suryawan, 2022). Understanding students' perceptions of the supervisory process is essential for improving supervision quality and addressing challenges faced by both students and supervisors. Accordingly, this study aims to examine how undergraduate students perceive the supervisory process in final-year projects (FYPs), to explore their views on the roles and responsibilities of supervisors in supporting research, and to identify the key factors that influence the effectiveness of the supervisory experience. By addressing these objectives, the study seeks to inform the refinement of FYP supervisory practices, strengthen student-supervisor relationships, and ultimately enhance research quality and academic success among undergraduates.

Literature review

Defining academic supervision

Academic supervision is a vital component of higher education, particularly in the realm of research, where supervisors provide essential guidance to students (Hayani, 2022). This guidance encompasses a variety of supportive and mentoring activities designed to enhance students' academic and research skills (Paulina et al., 2023). In the context of final-year projects, academic supervision involves a pedagogical relationship between supervisors and students, focusing on navigating the research process, ensuring timely project completion, and integrating students into the academic community (Hayani, 2022; Sá et al., 2021). The importance of academic supervision extends across various academic levels, including bachelor's, master's, and PhD programmes. Katowa-Mukwato (2023) emphasized that effective supervision is crucial for the success of end-of-programme projects, such as theses and dissertations. This process requires supervisors to implement strategies that recognize the inherent power dynamics and distinct responsibilities of each party, thereby promoting flexibility and adaptability (Yosepha et al., 2022). Supervisors play a critical role in enhancing students' academic and research skills by providing tailored support and mentorship (Yu and Liang, 2023). This includes offering practical assistance with assignments, referencing, and research methodologies (Rowland, 2022). Additionally, supervisors are responsible for guiding students through the research process and offering continuous mentorship to ensure the effective and efficient completion of their projects (Ellyta et al., 2022). This comprehensive support is essential for fostering student development and achieving successful research outcomes.

Significance of supervision in academic contexts

Supervision has a profound impact on student development and research outcomes, shaping their academic journeys and future careers. Effective supervision fosters critical thinking, independence, and academic excellence (Razali et al., 2020). In the context of undergraduate final-year projects, supervision plays a crucial role in guiding students

through the research process, facilitating efficient project completion, and ensuring their integration into academia (Katowa-Mukwato, 2023). The significance of supervision extends beyond undergraduate education to postgraduate education and training. Effective supervision is essential for postgraduate success, as it supports students in identifying research topics, developing study protocols, and completing projects on time (Arizal et al., 2022). The alignment between a student's project and the supervisor's interests and expertise can significantly influence the student's enthusiasm and the overall research facilitation (Sá et al., 2021). This alignment is critical for maintaining student motivation and ensuring that research projects are completed efficiently and to a high standard. Furthermore, academic supervision activities are vital for improving the quality of student output, motivating educators, and enhancing the overall learning experience (Falah and Suryawan, 2022). The continuous need for academic supervision programmes in educational institutions highlights the importance of structured and effective supervisory practices. These programmes ensure that students receive the necessary support and guidance throughout their academic journey, leading to better research outcomes and overall academic success.

Roles and responsibilities of supervisors

Supervisors play multifaceted roles in student research projects, providing structured guidance, feedback, and support. They assist in defining research focus, selecting methodologies, and managing timelines, balancing between directive and facilitative roles (Roberts and Seaman, 2018). In undergraduate final-year projects, supervisors are particularly crucial as they help shape the research themes and contents, provide access to necessary facilities, and assist in the manuscript writing process (Althubaiti and Althubaiti, 2022). The supervision process encompasses various aspects, including administrative support, guidance, and monitoring, to ensure efficient project completion (Arizal et al., 2022). Research on supervision at the bachelor level underscores the complexity and variety of roles attributed to supervisors and students. These roles can range from transactional to interactional types, and from providing support to managing the entire research process (Adel et al., 2023). The selection of an appropriate supervisor is a critical determinant of a student's project success, as alignment with the supervisor's interests and expertise can significantly enhance the student's enthusiasm and facilitate their research endeavors (Falah and Suryawan, 2022). Understanding these diverse roles and expectations is essential for fostering successful supervisor-student relationships. Effective supervisors not only guide students through the technical aspects of their research but also mentor them in developing critical thinking and independent research skills. This holistic approach is vital for enhancing the overall research experience for undergraduate students, leading to better academic outcomes, and preparing them for future research opportunities.

Supervisor roles in supervising research projects

Likewise, supervisors play a pivotal role in guiding students through research projects, offering their expertise and feedback to foster independent research skills (Wang et al., 2023). They adeptly transition from directive to supportive roles, promoting student autonomy and nurturing the development of independent research capabilities (Paulina et al., 2023). Effective supervision involves assisting students in developing feasible research topics, providing comprehensive oversight throughout the

research process, and ensuring timely project completion (Hart et al., 2022; Sá et al., 2021). Additionally, supervisors are responsible for helping students acquire both generic and research-based skills essential for project success. These skills include critical evaluation of medical information, scientific writing, and research methodology (Katowa-Mukwato, 2023). Supervisors offer expert assistance in specific areas such as statistics and scientific writing, which are crucial for the completion of high-quality research projects (AlSabah et al., 2018). Moreover, supervisors must navigate the dynamic nature of the supervisory relationship, acknowledging the asymmetric power dynamics between themselves and their students. This involves fostering a flexible approach to adapt to the evolving needs of the project and the individuals involved (Kumaran et al., 2018). By balancing authoritative guidance with supportive mentorship, supervisors can create an environment that encourages student growth, independence, and academic excellence.

Supervisor responsibilities for student development and learning

Supervisors hold a significant responsibility for the holistic development of students, encompassing their academic, professional, and personal growth. They create a supportive academic environment, ensuring that students have access to the necessary resources and support to thrive (Mhunpiew, 2013). During undergraduate final-year projects, supervisors play a crucial role as facilitators, mentors, and guides, aiding in exam preparation and overall academic development (Agricola et al., 2020). In guiding students through their final-year projects, supervisors assist in selecting appropriate research topics, overcoming challenges, and maintaining effective communication throughout the project's duration (Kamil et al., 2019). This guidance is pivotal in developing students' research competencies, particularly in the context of the undergraduate FYP (Reguant et al., 2018). Supervisors also focus on enhancing their supervision practices to ensure student satisfaction and achieve positive outcomes. This improvement can be seen through initiatives like workshops and webinars designed to elevate the quality of supervision (Pratt-Adams and Longcroft, 2020). Furthermore, supervisors provide essential guidance, support, and feedback, significantly contributing to the successful completion of final-year projects. Their role extends beyond mere oversight, encompassing the mentorship needed to foster students' academic and research skills. This comprehensive support is crucial for enhancing the overall learning experience of students in higher education, leading to better research outcomes and greater academic success (Hassani et al., 2018).

Interpersonal dynamics in supervisor-student relationship

The quality of the interpersonal relationship between supervisors and students greatly influences research outcomes. Effective communication, mutual respect, and understanding are crucial components of a positive supervisory relationship (Taspinar, 2019). In the context of undergraduate final-year projects, interpersonal dynamics play a pivotal role in shaping the supervisor-student relationship. Research indicates that a strong partnership between students and supervisors significantly enhances student satisfaction and project success (Pratt-Adams and Longcroft, 2020). However, there often exists a perceived inequality of experience due to varying supervisory styles. Not all students feel they have successfully built a partnership with their supervisor, highlighting the disparities in supervision experiences (Veuger et al., 2018).

Expectations also differ between junior and senior students, with many students anticipating shared responsibilities with their supervisors in various aspects of the research project (Naim and Dhanapal, 2015a). Furthermore, the expertise of the supervisor, the timeliness of feedback, the duration of the project, and the frequency of meetings all significantly impact the supervisor-student relationship (Naim and Dhanapal, 2015b). The acquisition of skills through interactions with supervisors enhances student satisfaction and influences the competencies developed during the research process (Althubaiti and Althubaiti, 2022). Therefore, fostering effective interpersonal dynamics is essential for a successful and fulfilling supervisor-student relationship in undergraduate final-year projects. By prioritizing effective communication, mutual respect, and understanding, supervisors can create a supportive environment that maximizes student development and research success.

Communication styles and effectiveness in academic supervision

Effective communication is fundamental in academic supervision, particularly in the context of undergraduate final-year projects. The communication styles employed by supervisors play a crucial role in determining the success of the supervisor-student relationship. Supervisors need to be approachable and provide clear, constructive feedback to facilitate student learning and research progress (Razali et al., 2020). According to Razali (2023), the quality of the student-supervisor partnership significantly influences the overall project experience and outcome. Establishing a good relationship through clear communication of expectations is essential to prevent miscommunication and mismatched expectations, which can lead to delays in research progress and completion (Yong and Saleh, 2023). The alignment of students' learning characteristics with the supervising lecturers' styles is vital for the quality of the final project implementation, emphasizing the importance of matching communication and supervisory styles for optimal results (Veuger et al., 2018). Masek (2017) highlighted that effective communication styles stimulate a productive supervisor-student relationship, while miscommunication often leads to mismatched expectations and an ineffective relationship. Therefore, fostering communication styles that promote understanding, clarity, and mutual expectations is key to enhancing the effectiveness of the supervisor-student relationship in undergraduate final-year projects. By prioritizing open, transparent communication and aligning supervisory approaches with students' learning preferences, supervisors can significantly improve the overall academic supervision experience and project outcomes.

Perceptions and expectations of supervisors and students

Perceptions and expectations wield considerable influence within the supervisory dynamic between students and their mentors. When these perceptions and expectations are not in harmony, it can lead to various challenges, underscoring the importance of clear communication and mutual understanding (Stappenbelt and Basu, 2019). Research findings suggest a diversity of viewpoints among supervisors and students regarding undergraduate final-year project supervision. Studies indicate that students highly value supervisors who possess not only strong subject knowledge but also effective communication skills, guidance abilities, and a willingness to embrace innovation (Keskin et al., 2023). Both supervisors and students view assessment rubrics as beneficial tools for enhancing research performance. Rubrics serve as motivational aids

for students, prompting them to refine their skills, while simultaneously aiding supervisors in pinpointing strengths and weaknesses in student research endeavors (Gan et al., 2023). In a specific context, such as an intensive teaching environment within a medical college in Oman, both supervisors and students reported high satisfaction levels with undergraduate research experiences. They emphasized the relevance of the research skills acquired and highlighted positive interactions with supervisors. However, supervisors expressed concerns regarding the availability of resources to adequately support research endeavors (Al Ajmi et al., 2023). Similarly, within the landscape of undergraduate research supervision in a Malaysian university, there exists a perception of a traditional, supervisor-centric approach. This underscores the need for a psychological supervision ("psy-supervision") approach, which aims to cultivate independent and active student engagement in research and learning processes (Razali, 2023).

Common challenges encountered by supervisors and students

The challenges encountered by supervisors and students in undergraduate final-year projects are diverse and complex, impacting various aspects of the supervisory process and student outcomes (Lovitts, 2005). Balancing guidance while fostering independence, managing multiple roles and responsibilities, and navigating cultural differences between disciplines are among the key challenges highlighted by Pratt-Adams and Longcroft (2020). Noor et al. (2023) stress the importance of aligning expectations between students and supervisors, advocating for clear guidelines and role definitions. Mitchell and Rich (2021) underscore the pivotal role of the student-supervisor relationship, emphasizing the need for supervisor training and injecting enjoyment into the research process. They also point out gaps in students' practical skill comprehension and emphasize the transformative potential of effective supervision. Prioritizing the development of research skills over output in undergraduate thesis supervision is advocated by Stappenbelt and Basu (2019), recognizing the crucial guidance students rely on to complete their final year projects (Rusli et al., 2023). Misalignments in perceptions of supervisory feedback can lead to misunderstandings, as highlighted by Neupane Bastola (2022), who also points out time constraints and communication issues as common challenges.

Djatkika et al. (2022) identify ineffective communication, time constraints, data collection hurdles, and reduced respondent participation as common obstacles. Nurkamto et al. (2022) expand on technological competencies, time management, field research complexities, and motivation fluctuations, including challenges specific to online supervision processes. Hassani et al. (2018) draw attention to challenges such as assignment procedures, group versus individual projects, supervision methods, outcome evaluation, fair assessment, and guideline consolidation. Next, time management issues and inconsistencies in supervision processes are highlighted by Reguant et al. (2018) as well as Roberts and Seaman (2018), respectively. In online distance learning settings, Haleem and Asghar (2023) reveal additional challenges such as limited discussion with supervisors, insufficient time for research, inadequate digital library resources, content deficiencies, and difficulties in tool/questionnaire selection, resource access, participant engagement, and result reporting. Additionally, students' concerns about supervisor bias (Nyamapfene, 2012) and the lack of supervisory support due to workload and distance (Marimo and Mashingaidze, 2014) are also significant challenges. Likewise, Al-Doubi et al. (2019) highlight supervisors' struggles with task balancing and feedback provision,

while students face challenges in understanding the research process and meeting project expectations.

Addressing conflicts in supervisory relationships

Conflicts within supervisory relationships are commonplace, often arising from discrepancies in expectations and breakdowns in communication. To mitigate these issues, effective conflict resolution strategies and clear guidelines are essential (Tahir et al., 2012). Addressing conflicts in undergraduate final-year project supervisory relationships requires a multifaceted approach, as outlined in various research papers. Ahmadi et al. (2020) propose employing intelligent interaction as a strategy, emphasizing logical reasoning, competent role-playing, flexibility, and seeking external assistance as vital components of conflict resolution in academic settings. Furthermore, providing training and guidance for supervisors, particularly those new to the role, can significantly enhance the quality of the supervision process and the feedback provided to undergraduate students throughout their research projects (Al-Doubi et al., 2019). Liu et al. (2023) suggest establishing clear communication channels and expectations, fostering open dialogue, and promoting mutual respect as effective means of resolving conflicts. Additionally, Sá et al. (2021) advocate for addressing conflicts through effective communication and mutual understanding, along with encouraging active participation and providing timely feedback to facilitate conflict resolution. Overall, this literature review underscores the intricate nature of academic supervision, underscoring the pivotal role of supervisors in nurturing students toward independent research prowess. Effective communication, unambiguous guidelines, and nurturing relationships are foundational for fruitful supervision endeavors. While traditional models provide structure, they sometimes constrain student autonomy. Yet, innovative approaches and adaptive supervision present promising alternatives by advocating for collaborative and supportive atmospheres. These approaches cultivate mutual respect and transparent expectations, tackling the complexities of academic supervision with a balanced approach that prioritizes both academic and personal growth (Lee, 2008).

Materials and Methods

Study design and participants

This study employed a quantitative cross-sectional survey design. Participants were final-semester Diploma in Pharmacy students enrolled in the compulsory Final-Year Project (FYP) course within the Diploma in Pharmacy programme at Universiti Teknologi MARA (UiTM), Cawangan Pulau Pinang, Kampus Bertam (Othman et al., 2024a; 2023a). Data collection was conducted during the third semester of the 2022–2023 academic year, from March to August 2023. All registered students were invited to participate. The minimum sample size was calculated using the Raosoft calculator with a 5% margin of error and 95% confidence level, yielding a required sample of 84 students (Othman et al., 2023b).

Instrument and data collection

Data were collected using a self-administered online questionnaire developed in Google Forms and distributed via WhatsApp (Najib et al., 2023; Sulaiman et al., 2023). The survey was administered near the completion of students' FYPs to ensure adequate

supervisory exposure. The instrument was adopted and adapted from validated tools by Rusli et al. (2023) as well as Naim and Dhanapal (2015a; 2015b). The questionnaire consisted of four sections: demographic characteristics (Section A), perceptions of the supervisory process (Section B, 13 items), perceptions of supervisors' roles (Section C, 12 items), and factors affecting supervision (Section D, 9 items). Items in Sections B, C, and D were measured using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Open-ended questions were included to capture perceived challenges and suggestions for improving the FYP supervisory process.

Data analysis and ethical consideration

Data were analysed using IBM SPSS Statistics version 26. Descriptive statistics (frequencies, percentages, means, and standard deviations) were used to summarise demographic data and students' responses. Mean scores were interpreted according to the guidelines proposed by Pimentel (2010), where higher means indicate stronger agreement (Othman et al., 2024a; 2024b). The calculated mean scores were interpreted based on *Table 1* (Othman et al., 2025). For inferential analysis, the Mann–Whitney U and Chi square tests were applied to examine differences in perceptions between male and female students, as the Likert-scale data were ordinal and did not assume normal distribution. Statistical significance was set at $p < 0.05$. Responses to open-ended questions on challenges and proposed improvements were analysed using thematic content analysis following the approach of Vaismoradi et al. (2013). Ethical procedures were observed by providing participants with study information, obtaining informed consent, and ensuring anonymity and confidentiality throughout the research process (Othman et al., 2023b).

Table 1. Interpretation of calculated mean score (M).

Mean range	Interpretation
1.00 - 1.80	Strongly disagree
1.81 - 2.60	Disagree
2.61 - 3.40	Neutral
3.41 - 4.20	Agree
4.21 - 5.00	Strongly agree

Results and Discussion

Demographic characteristics of respondents

A total of 105 final-semester Diploma in Pharmacy students participated in the study (*Table 2*). Most respondents were female (72.4%), with males comprising 27.6%. The majority were 21 years old (89.5%), reflecting the typical age profile of students undertaking the final year project (FYP).

Table 2. Demographic of respondents.

Variables	Category	Frequency (N)	Percentage (%)
Age (years)	20	1	1.0
	21	94	89.5
	22	9	8.6
	24	1	1.0
Gender	Male	29	27.6

Female

76

72.4

Students’ perceptions of the supervisory process

Overall, students reported positive perceptions of the supervisory process (*Table 3*). High mean scores were observed for supervisors listening to and respecting students’ ideas (mean = 4.25), approachability (mean = 4.18), and provision of constructive feedback (mean = 4.18). Students also agreed that their performance improved following supervisory feedback (mean = 4.18). Other positively rated attributes included supervisors’ reliability, availability, responsiveness, effectiveness of guidance, and promptness of feedback (means ranging from 4.01 to 4.10). Reprimands for poor performance received a lower, though still positive, mean score (3.83). No significant gender differences were found in perceptions of the supervisory process. Our findings indicate that undergraduate students generally perceive FYP supervision positively, particularly in relation to supervisor approachability, respect for students’ ideas, and constructive feedback. These attributes are essential for fostering autonomy and critical thinking in undergraduate research, consistent with previous studies (Agricola et al., 2020; Reguant et al., 2018). The high value placed on approachability and responsiveness aligns with earlier work highlighting the importance of supportive supervisory relationships in undergraduate contexts (Rusli et al., 2023; Tuppal et al., 2022; Naim and Dhanapal, 2015a).

Table 3. Students’ perceptions of the supervisory process.

Statement	Frequency [N] (Percentage [%])					
	SA	A	N	D	SD	M
My supervisor listens/ respects my opinions/ views/ ideas	50 (47.6)	41 (39.0)	8 (7.6)	2 (1.9)	4 (3.8)	4.25
My supervisor is approachable	52 (49.5)	30 (28.6)	16 (15.2)	4 (3.8)	3 (2.9)	4.18
My supervisor gives constructive feedback	49 (46.7)	35 (33.3)	15 (14.3)	3 (2.9)	3 (2.9)	4.18
My performance improved after receiving my supervisor’s feedback	49 (46.7)	35 (33.3)	15 (14.3)	3 (2.9)	3 (2.9)	4.18
My supervisor’s expectation can be fulfilled	42 (40.0)	40 (38.1)	17 (16.2)	3 (2.9)	3 (2.9)	4.10
My supervisor is reliable	48 (45.7)	30 (28.6)	21 (20.0)	2 (1.9)	4 (3.8)	4.10
My supervisor is readily available for consultation	50 (47.6)	28 (26.7)	17 (16.2)	5 (4.8)	5 (4.8)	4.08
My supervisor is responsive	51 (48.6)	26 (24.8)	16 (15.2)	7 (6.7)	5 (4.8)	4.06
My supervisor’s guidance is effective	48 (45.7)	26 (24.8)	22 (21.0)	7 (6.7)	2 (1.9)	4.06
My supervisor gives feedback promptly	48 (45.7)	29 (29.7)	16 (15.2)	7 (6.7)	5 (4.8)	4.03
My supervisor often motivates and encourages me	45 (42.9)	27 (25.7)	26 (24.8)	3 (2.9)	4 (3.8)	4.01
My supervisor praises/compliments me for good work	45 (42.9)	30 (28.6)	20 (19.0)	6 (5.7)	4 (3.8)	4.01
My supervisor reprimands me for poor performance	38 (36.2)	28 (26.7)	27 (25.7)	7 (6.7)	5 (4.8)	3.83

Note: SA=Strongly Agree; A=Agree; N=Neutral; D=Disagree; SD=Strongly Disagree; M=Mean.

Students’ perceptions of the roles of supervisors

Table 4 summarizes students’ perceptions of the roles of supervisors. Students expressed strong agreement with most supervisory roles, particularly maintaining professional relationships (mean = 4.64), providing guidance on FYP policies and requirements (mean = 4.56), ensuring academic standards (mean = 4.56), monitoring progress, and ensuring timely completion of the FYP. Guidance on research methodology and data analysis, clear timelines, and regular meetings were also highly valued. The role of supervisors in selecting research topics received comparatively lower agreement (mean = 3.80). A significant gender difference was observed only for maintaining professional relationships, with female students reporting higher expectations (*p = 0.032). Students’ strong agreement with supervisors’ professional conduct and guidance on FYP requirements reinforces the view that structured

supervision is critical for maintaining academic standards and ensuring timely project completion (Macfadyen et al., 2019; Roberts and Seaman, 2018). The lower agreement regarding supervisors selecting research topics suggests a preference for autonomy, supporting evidence that student-chosen topics enhance motivation and engagement (Zafar et al., 2021; Djamila and Makinda, 2016).

Table 4. Students' perceptions of the roles of supervisors.

Statement	Frequency [N] (Percentage [%])					
	SA	A	N	D	SD	M
*Maintains professional relationships	73 (69.5)	28 (26.7)	3 (2.9)	0 (0.0)	1 (1.0)	4.64
Provides / advice on policies, procedures, guidelines and requirements of the FYP	66 (62.9)	34 (32.4)	4 (2.8)	0 (0.0)	1 (1.0)	4.56
Responsible regarding the standard of the FYP report	65 (61.9)	36 (34.4)	3 (2.9)	0 (0.0)	1 (1.0)	4.56
Sees all drafts to ensure students are on the right track	69 (65.7)	29 (27.6)	4 (3.8)	2 (1.9)	1 (1.0)	4.55
Checks students' progress regularly	67 (63.8)	29 (27.6)	8 (7.6)	0 (0.0)	1 (1.0)	4.53
Ensure FYP report is completed on time	64 (61.0)	35 (33.3)	5 (4.8)	0 (0.0)	1 (1.0)	4.53
Conducts initial meeting to clarify the FYP objectives	61 (58.1)	36 (34.3)	7 (6.7)	0 (0.0)	1 (1.0)	4.49
Provides guidance on research methodology and data analysis	59 (56.2)	41 (39.0)	3 (2.9)	1 (1.0)	1 (1.0)	4.49
Provides clear timelines/milestones	60 (57.1)	37 (35.2)	6 (5.7)	1 (1.0)	1 (1.0)	4.47
Insists on regular meetings/communication	49 (46.7)	39 (37.1)	14 (13.3)	2 (1.9)	1 (1.0)	4.27
Provides sufficient resources (e.g., journals, books, software etc.)	44 (41.9)	34 (32.4)	23 (21.9)	3 (2.9)	1 (1.0)	4.11
Selects/decides on the research topic	25 (23.8)	43 (41.0)	30 (28.6)	5 (4.8)	2 (1.9)	3.80

Note: SA=Strongly Agree; A=Agree; N=Neutral; D=Disagree; SD=Strongly Disagree; M=Mean.

Factor affecting the supervisory process

Table 5 shows that timely feedback (mean = 4.39), frequency of meetings and communication (mean = 4.32), and project duration (mean = 4.30) were identified as the most influential factors. Supervisors' expertise, experience, and student-supervisor ratio were also rated positively. Supervisor gender had a neutral influence (mean = 3.09). A significant gender difference was found only for meeting frequency (*p = 0.048). Timely feedback and regular communication emerged as the most influential factors affecting supervision, echoing findings that feedback quality and interaction frequency are central to effective learning and project success (Bahtilla, 2022; Razali et al., 2020; Nicol and Macfarlane-Dick, 2006). The neutral perception of supervisor gender supports prior research indicating that relational and pedagogical factors outweigh demographic characteristics in shaping supervisory effectiveness (Rusli et al., 2023; Farrell and Frank, 2022).

Table 5. Factors affecting the supervisory process.

Statement	Frequency [N] (Percentage [%])					
	SA	A	N	D	SD	M
Timely feedback from supervisor	60 (57.1)	32 (30.5)	9 (8.6)	2 (1.9)	2 (1.9)	4.39
*Numbers of meetings/ regular communications with supervisor	52 (49.5)	41 (39.0)	8 (7.6)	2 (1.9)	2 (1.9)	4.32
Duration of the project	49 (46.7)	45 (42.9)	7 (6.7)	2 (1.9)	2 (1.9)	4.30
Supervisors' expertise	52 (49.5)	32 (30.5)	13 (12.4)	5 (4.8)	3 (2.9)	4.19
Number of students being supervised by a particular supervisor at one time	45 (42.9)	39 (37.1)	17 (16.2)	1 (1.0)	3 (2.9)	4.16
Supervisor's experience	47 (44.8)	33 (31.4)	19 (28.1)	3 (2.9)	3 (2.9)	4.12
Supervisor that had taught you before (in previous semesters)	38 (36.2)	37 (35.2)	23 (21.9)	5 (4.8)	2 (1.9)	3.99
Supervisor's qualification	24 (22.9)	30 (28.6)	34 (32.4)	11 (10.5)	6 (5.7)	3.52
Supervisor's gender	16 (15.2)	21 (20.0)	40 (38.1)	12 (11.4)	16 (15.2)	3.09

Note: SA=Strongly Agree; A=Agree; N=Neutral; D=Disagree; SD=Strongly Disagree; M=Mean.

Students seeking support during FYP

Table 6 illustrates the percentage of students who sought support during their final year project (FYP). A significant majority of students (88.6%) reported seeking assistance during their FYP, highlighting a high level of reliance on external guidance. Our findings indicated that students sought support from various sources, including other supervisors or lecturers, friends, and family members. This substantial percentage underscores the crucial role that supervisors, peers, and additional resources play in aiding students throughout their projects. Previous studies have shown that undergraduate students frequently seek support for their FYPs from various parties (Rusli et al., 2023; Luo et al., 2022). Only twelve students (11.4%) did not seek any support, suggesting that most students recognize the advantages of seeking help and utilizing available resources to improve their project outcomes. Likewise, a Chi Square test suggests that there is no significant difference between male and female students in terms of seeking support during FYP completion.

Table 6. Student seeking support during FYP.

Seeking support during FYP	Frequency (n)	%
Yes	93	88.6
No	12	11.4

Communication interval with supervisors

Table 7 details the frequency of communication between students and their supervisors, revealing a varied pattern of intervals. Approximately one-quarter of the students (25.7%) communicated with their supervisors on a weekly basis, which is the most frequent interval reported. Another quarter (24.8%) engaged in bi-weekly communications, while 16.2% communicated monthly. Interestingly, more than a quarter (26.7%) indicated that they communicated "sometimes," suggesting irregular, non-fixed intervals. A smaller percentage of students rarely (5.7%) communicate whilst only one student never communicates with the supervisor. Specifically for our students, FYP supervision was conducted virtually, as all students were concurrently in their hospital training. The frequency of meetings varied, occurring weekly, bi-weekly, or fortnightly, depending on the availability of both supervisors and students. The expected duration for each meeting ranged from 15 minutes to 1 hour (Djamila and Makinda, 2016). These findings highlight the diverse communication patterns among students and suggest a potential need for more structured and consistent communication schedules to effectively support students throughout their FYP process.

Table 7. Communication interval with supervisors.

Communication interval	Frequency (n)	%
Weekly	27	25.7
Bi-weekly	26	24.8
Monthly	17	16.2
Sometimes	28	26.7
Rarely	6	5.7
Never	1	1.0

Students' satisfaction with supervisors

Students' overall satisfaction with their supervisors is depicted in *Table 8*. A significant portion of the respondents expressed high levels of satisfaction, with 42.9% reporting that they were very satisfied and 32.4% indicating that they were satisfied. Meanwhile, 15.2% of the students felt neutral about their supervisory experience, 6.7% were dissatisfied, and 2.9% were very dissatisfied. These results suggest that while the majority of students are content with their supervision, there is still room for improvement to address the concerns of the minority who were less satisfied. Students' satisfaction with their supervisor's supervision during their FYP varies based on the supervisory approach. Rusli et al. (2023) illustrate that students highly value guidance from supervisors while also desiring autonomy in decision-making regarding their projects. Effective supervisor-supervisee approaches have been shown to significantly enhance student engagement and satisfaction with undergraduate dissertation supervision (Kushwah and Navrouzoglou, 2022). Additionally, Tuppal et al. (2022) demonstrated that students are satisfied with their supervisor's guidance, as it fosters critical thinking, inquisitiveness, and caring intuitiveness, thereby enhancing their overall research experience. Improving the supervisory process to address the needs of the less satisfied students is essential. Strategies could include ensuring regular and structured communication, providing timely and constructive feedback, and balancing guidance with the autonomy students need to develop their research skills. By addressing these aspects, supervisors can enhance the overall satisfaction and success of their students' FYP experiences. Our result suggests that there is a significant difference in satisfaction with the supervisory roles of their own supervisor for the FYP between the male and female students compared ($p = 0.031$).

Table 8. *Students' satisfaction with supervisors.*

Supervisory roles satisfaction	Frequency (n)	%
Very satisfied	45	42.9
Satisfied	34	32.4
Neutral	16	15.2
Dissatisfied	7	6.7
Very dissatisfied	3	2.9

Challenges encountered during FYP process

Table 9 provides a thematic analysis of the challenges students encountered during the FYP process. Time management emerged as a significant challenge, with students struggling to balance their FYP with other commitments and facing delays due to late feedback from supervisors. Issues related to supervisors, such as delays in checking progress and lack of clear guidance, were also prevalent. Communication and collaboration difficulties, including irregular progress checks and lack of cooperation among team members, further compounded these challenges. Additionally, students faced problems in data collection, such as difficulty in gathering data and analysing it using SPSS. A lack of understanding of FYP requirements and unclear guidelines for report writing were also identified as critical issues. Other challenges included internet problems and difficulty persuading respondents to participate.

Table 9. *Thematic analysis of challenges encountered during FYP process.*

Theme	Examples of challenges
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Time Management	<i>Working on a time-sensitive project Not enough time due to internship and practical work Balancing time between FYP and other commitments</i>
Supervisor Issues	<i>Supervisor taking a long time to check progress Supervisor cancelling meetings frequently Lack of clear guidance from supervisor</i>
Communication and Collaboration Issues	<i>Difficulty communicating with team members Lack of cooperation from group members Irregular checking of students' progress</i>
Data Collection	<i>Difficulty collecting data Problems with getting enough respondents Analysing data using SPSS</i>
Project Understanding and Guidance	<i>Lack of understanding of FYP requirements Cluelessness about topic selection Need for clear guidelines and briefing on FYP tasks</i>
Others	<i>Internet problems during online meetings</i>

Suggestions for FYP process improvement

Students provided several suggestions for improving the FYP process, as summarized in *Table 10*. Early guidance and explanation were frequently mentioned, with students advocating for early exposure to FYP and clear explanations and briefings about the process. Recommendations related to supervisors included allowing students to choose their own supervisors, ensuring that all group members are involved in discussions, and providing comprehensive guidance. Enhancing communication and monitoring was another key suggestion, with students calling for regular meetings, reminders, and frequent updates. Clarity and guidance were emphasized, with students seeking clear guidelines and instructions. Finally, students suggested extending the time allocated for FYP and integrating FYP into the curriculum to provide more opportunities for project work.

Table 10. *Thematic analysis of suggestions for FYP process improvement.*

Theme	Examples of challenges
Early Guidance and Explanation	<i>Early exposure on how to do an FYP Clear explanation for first-time FYP Briefing about FYP</i>
Supervisor-Related Recommendations	<i>Let students choose their own supervisor Provide full assistance and guidance to students Prompt feedback and corrections from supervisor</i>
Communication and Monitoring	<i>Regular meetings for progress checks Reminders and frequent updates from supervisor Regular communication and feedback from supervisor</i>
Clarity and Guidance	<i>Clear instructions and information from supervisor Provide examples and guidance from senior projects Detailed guidance and timeline for FYP</i>
Responsiveness and Engagement	<i>Responsive communication from supervisor Frequent check-ins on progress Engagement and involvement in FYP process from supervisor</i>
Process Improvement	<i>Clear explanation of FYP process Ensure adherence to FYP guidelines Proper scheduling of meetings and activities for FYP</i>

This study has several limitations. The cross-sectional design limits causal interpretation between supervisory practices and students' perceptions and does not capture changes across the FYP period. The study was conducted in a single institution involving Diploma in Pharmacy students at UiTM Cawangan Pulau Pinang, Kampus Bertam, which restricts generalisability to other programmes or settings. Although the sample size met minimum requirements, a larger and more diverse sample would strengthen the findings. The reliance on self-reported data may introduce response and social desirability bias, particularly when evaluating supervisors. In addition, potentially

influential factors such as institutional resources, supervisor workload, and training were not examined. Future studies should adopt longitudinal and multi-institutional designs, include supervisors' perspectives, and apply mixed methods to provide a more comprehensive understanding of undergraduate FYP supervision.

Conclusion

This study investigated students' perceptions of supervision in undergraduate final-year projects (FYPs) and identified key supervisory practices that shape research experiences. Overall, students reported positive supervision, particularly valuing supervisors who were approachable, respectful of ideas, and provided constructive, timely feedback. These elements highlight communication as the foundation of effective FYP supervision. Students also emphasised the importance of supervisors' professional conduct and structured guidance, especially in research methods, progress monitoring, and clear timelines. Active supervisory engagement was associated with better organisation, confidence, and project management. Timely feedback, regular meetings, project duration, and supervisors' expertise emerged as the most influential factors affecting supervision quality, alongside manageable supervisory workload and familiarity between supervisors and students. In a nutshell, impactful undergraduate FYP supervision depends on responsive communication, professional responsibility, and systematic guidance. Strengthening these areas can enhance supervisor–student relationships and contribute directly to improved research performance and academic success.

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Conflict of interest

The authors declare that there are no conflicts of interest associated with this study.

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