Exploring Engineering Students' Perceptions Towards Supervision in Final Year Project (FYP)

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Abstract

Supervision is very important in teaching and learning process in higher education. Both the lecturer (supervisor) and student (supervisee) must know about supervisory process for the supervisory process to be smooth. This study is conducted with the aim to explore undergraduate engineering students' views on (1) supervisory process, (2) role of supervisors, and (3) factors that affect supervisory process. A total of 246 undergraduate engineering students, who are supervisees for Final Year Project (FYP) respond to an online survey. The survey has 4 main sections; Demographic Profile, Students' Perceptions of the Supervisory Process, Students' Perceptions of the Role of the Supervisors, and Factors that Affect a Supervisory Process. The responses were analysed using SPSS 26, which are frequency and mean. It was found that students depend on their supervisor for guidance to complete FYP. However, the students also want to make their own decision relating to theoretical framework, methodology, design, and title for FYP. The findings in this study contribute to the body of knowledge on supervision as the findings can assist supervisors to understand more on the students' perceptions towards supervisory process. When the supervisory process is smooth, the students will be more motivated and perform better.
Keywords: Supervision, Supervisor, Supervisee, Engineering, Final Year Project

Introduction

Supervision is an essential element in the academic world, especially in higher institutions. The supervision involves a supervisor and a supervisee. A supervisor is an instructor or a lecturer that guide a supervisee to complete a task or a research project, while a supervisee is an undergraduate or a postgraduate student that must complete the task or research project to graduate. Examples of the task or research project are final year project (FYP),

dissertation, or thesis. The duration of the supervisory process based on the duration included in the academic curriculum.

Studies on supervision are crucial to shed light on this area and to ensure successful completion of the research projects via positive supervisor-supervisee relationships. As stated by Naim and Dhanapal (2017), studies on supervision need to be conducted with different students and supervisors from different disciplines. Engineering programme is one of the disciplines and it is important because the engineering students involve in supervisory process to complete their FYP. FYP can make students to value and appreciate life-long learning (Uziak, 2015). Hence, this study is conducted to add knowledge on supervision from the undergraduate engineering students' perspective that are from Mechanical Engineering programme. The study benefits the students, supervisors, and organization for the supervisory process to be effective and efficient. Specifically, this study is conducted to answer the following questions:

- How do students perceive the supervisory process?
- How do students perceive the role of the supervisors?
- What are the factors that affect the supervisory process according to students?

Literature Review
Supervision

Supervisory process includes a supervisee and supervisor. Derounian (2011) defines supervision as an act of dance as both students and lecturers are working together as partners to manage dissertation preparation. Supervisors must be aware of the whole course and only supervising the students' research project. They do not advise any taught components learnt by the students before (Doan et al., 2022). It is the students' role to solve the problem with the help of the supervisors using what the students had learnt before (Uziak, 2015). Therefore, both students and lecturers are important in the supervisory process. Supervisees need the supervisors to guide them to complete the task or research project successfully.

Numerous factors can affect the supervisory process that involved the supervisor and supervisee; either the supervision will be a success or a failure. Supervisors need to have a good and relevant expertise, experience, and qualification to supervise (Doan et al., 2022; Naim & Dhanapal, 2017). When the supervisors lack of adequate research experience and exposure to research skills, it will pose many problems relating to the quality research projects and completion of the projects on time. The supervisor will not have the confidence to supervise the students and it will make the students frustrated and angry (Simuforosa, Veronica, & Rosemary, 2015). Timely and constructive feedback from supervisors is also very helpful to help the students. Insufficient and delayed feedback can interfere with the completion of the project (Razali, Hawe, & Dixon, 2020; Derounian, 2011; Simuforosa, Veronica, & Rosemary, 2015). Consequently, both the students and supervisors need to work together to ensure the project is completed on time (Lessing, 2011). Meetings can also impact the effectiveness of the supervision. The meetings can be in terms of the frequency, either every week, twice per week, or once in a fortnight. The duration expected for each meeting ranges from 15 minutes to 1 hour (Djamila & Makinda, 2016). Number of supervisees or groups being supervised is another factor that can affect supervision (Naim & Dhanapal, 2017). Students need to be serious and committed when they are involved in the supervisory process. They need to go for the consultation, implement the suggestion given by the supervisors, and show progress (Simuforosa, Veronica, & Rosemary, 2015).

Roles and Responsibilities of Supervisors

The main role and responsibility of supervisors is to guide the students to keep them on track (Derounian, 2011). They should guide in terms of the research requirements; literature review, research questions, methodology, and data analysis. This is because supervisors are experts and well-versed with the rules and know about the methodology (Sidhu et al., 2014). However, the supervisors' role is just to guide and facilitate. The supervisors need to allow the students to explore areas of interest and not to prevent that interest (Hodza, 2007). So, supervisors should be able to listen. They should listen to suggestions, discuss issues arising from reading and research, and assist in solving problems that may arise (Derounian, 2011). They should respect the students' ideas and views during the supervisory process (Doan et al., 2022).

Supervisors also need to act as motivators because motivation is important in supervision (Sidhu et al., 2014; Halim et al., 2014). They need to encourage the students and be firm where necessary (Derounian, 2011). They should not make harsh comments because students are uncomfortable when receiving negative feedback (Doan et al., 2022). Supervisors that provide negative and inadequate feedback also demotivates the students to complete the project (Simuforosa, Veronica, & Rosemary, 2015). Hence, supervisors need to have a good relationship with the supervisee in this partnership. They need to be professional. Personal relationships should not be involved (Lessing, 2011).

Past Studies on Students' Perception of Supervision

The role of supervisors from the student's perspective and expectations are investigated by Doan et al. (2022). A total of 100 English-major students at a university in Southwest Vietnam participated in this study by answering 49 questions in the questionnaire. The results explained that students have high expectations from their supervisors in terms of respect their opinions, have good scientific research knowledge, give constructive comments, and is always willing to help them when needed.

According to Razali, Hawe, and Dixon (2020), undergraduate supervision is perceived and practised as a traditional, supervisor-centric process. The purpose of the study is to explore undergraduate research supervision in a Malaysian university. Data was collected using individual, semi-structured interviews with students and supervisors. Findings indicated that it is essential to establish a research plan, clarify expectations, maintain regular contact, have time management, meet, and give and act on feedback.

A study conducted by Naim and Dhanapal (2017) revealed that the supervisor's area of expertise, timely feedback, duration of the research project, and the number of meetings with supervisors are the only factors affected according to gender of students. The objective of this study is to know undergraduate students' perception of the FYP's supervisory process. A total of 91 students in a private university in Malaysia participated in the study. They are from Business Administration (28.6%), International Business (22%), International Business and Marketing (48.4%), and Banking and Finance (1.1%) programme. They had to answer a survey to elicit information.

Djamila and Makinda (2016) conducted a study towards final year students of Civil Engineering programme in Universiti Malaysia Sabah. The aims of the study are to investigate the students' expectations and concerns in FYP. The students were asked to fill in the questionnaire twice, (1) prior starting FYP 1 and (2) after almost completing FYP 2. It was found that the students expect their supervisor timetable to be flexible (90%) and prefer face-to-face supervision (96%). Students also want to meet their supervisors once a week (47%)

and provide more time (90%). Their concerns are facing difficulties in one piece of work and time management.

Methodology

Research design of this study is a survey descriptive research. An online survey was administered to elicit information and the sampling technique used was convenience sampling. A total of 246 diploma students in a Malaysian public university participated in this study. The students are from Mechanical Engineering programme.

The survey consists of four sections (Table 1). Section A: Demographic Profile, the participants are asked to answer a question on gender. The items in Section B, C, and D were adapted from Naim and Dhanapal (2017). Section B: Students' Perceptions of the Supervisory Process has 10 items. Section C: Students' Perceptions of the Role of the Supervisors has 9 items. Section D: Factors that Affect a Supervisory Process has 8 items. All items were measured using a 5-item scale ranging from 'strongly disagree' (1) to 'strongly agree' (5).

Table 1
Distribution of Items in Instrument

Section	Variables	No. of Items
A	Demographic Profile	1
B	Students' Perceptions of the Supervisory Process	10
C	Students' Perceptions of the Role of the Supervisors	9
D	Factors that Affect a Supervisory Process	8

Data was collected via Google Form and analysed using SPSS version 26. The data then was presented in percentages for the Demographic Profile section and mean scores for each of the research objectives.

Findings

Demographic Profile

In total, there are 246 respondents involved in this study. Figure 1 displays the distribution of gender consisting of 74.8% male students and 25.2% of female students.
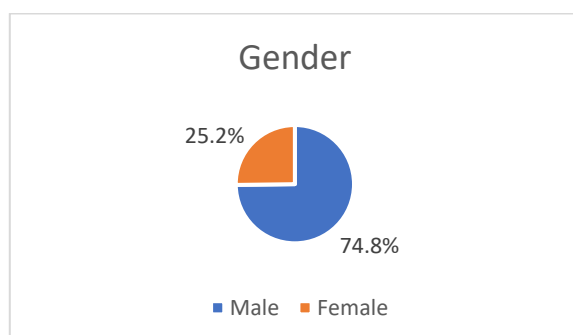

Figure 1 - Gender

Students' Perceptions of the Supervisory Process

Table 2 portrays students' perception of the supervisory process. All the statements received the mean score above 4, which are good. Students ranked their supervisors are available for consultation as the highest (M-4.45). It is followed by the statements of the supervisor that are approachable (M-4.44) and reliable (M-4.39). The supervisor also listens to the students' opinion and ideas (M-4.36). At the same time, the supervisor gives feedback (M-4.37) and

gives the feedback promptly (M-4.26). The students' performance improved after they followed their supervisor's feedback (M-4.25). Although the supervisor guides the students effectively (M-4.30), the supervisor did not really praise them for their good performance(M-4.24) or reprimand them for their poor performance (M-4.21) as these two statements ranked at the bottom of the category.

Table 2
Students' Perceptions of the Supervisory Process

No.	Item	Mean Score
1	My supervisor is available for consultation	4.45
2	My supervisor is approachable	4.44
3	My supervisor is totally reliable	4.39
4	My supervisor listens to my opinions/view	4.38
5	My supervisor often gives feedback	4.37
6	My supervisor guides me effectively	4.30
7	My supervisor gives feedback promptly	4.26
8	My performance improved after I follow my supervisor's feedback	4.25
9	My supervisor praises/compliments me for good performance	4.24
10	My supervisor reprimands me for poor performance	4.11

Students' Perceptions of the Role of the Supervisors

Students' perception of the role of the supervisors are depicted in Table 3. The highest statement in this category is supervisors should maintain professional relationships (M-4.26). To the students, it is the supervisor's role to ensure FYP is completed on time (M-4.18). Supervisors also need to ensure that students have access to services and facilities (M-4.21). Supervisors should see all drafts, including prototype, and thesis to ensure that the students are on the right track (M-4.16), and supervisors should check students' progress regularly (M-4.07). However, the students said that supervisors should not insist on regular meetings (M-3.94). Although they need advice from the supervisors on policies, procedures, and requirements (M-4.13), they do not perceive it is the supervisor's role to decide on the theoretical framework, methodology, and design of FYP (M-3.57). They also state that the supervisors should not select titles for FYP as this statement ranks as the lowest in this category (M-3.38).

Table 3
Students' Perceptions of the Role of the Supervisors

No.	Item	Mean Score
1	Supervisors should maintain professional relationship	4.26
2	Supervisors should ensure students have access to services and facilities	4.21
3	Supervisors should ensure FYP is completed on time	4.18
4	Supervisors should see all drafts (prototype and thesis) to ensure that the students are on the right track	4.16
5	Supervisors should advice on policies, procedures, and requirements	4.13
6	Supervisors should check students' progress regularly	4.07
7	Supervisors should insist on regular meetings	3.94

| 8 | Supervisors should decide on theoretical framework, methodology, and design of FYP (prototype and thesis) | 3.57 |
| 9 | Supervisors should select title for FYP | 3.38 |

Factors that Affect a Supervisory Process

As illustrated in Table 4, only two factors have the mean score above 4 which are supervisor's experience (M-4.13) and supervisor's expertise (M-4.11). Supervisor's qualification is not as important as experience and expertise because it is ranked as the second lowest (M-3.76). The factor that does not affect a supervisory process according to students is the supervisor's gender (M-3.09). Other factors that affect a supervisory process are timely feedback from supervisor (M-3.98), number of meetings (M-3.94), duration of completion (M-3.84), and number of supervisee/group being supervised (M-3.78).

Table 4
Factors that Affect a Supervisory Process

No.	Item	Mean Score
1	Supervisor's Experience	4.13
2	Supervisor's Expertise	4.11
3	Timely Feedback from Supervisor	3.98
4	Number of Meetings	3.94
5	Duration of Completion	3.84
6	Number of Supervisee/Group being Supervised	3.78
7	Supervisor's Qualification	3.76
8	Supervisor's Gender	3.09

Discussion
Students' Perceptions of the Supervisory Process

Students have good perceptions towards the supervisory process. It can be seen where the mean score of all the statements in this category is above 4. Students in this study also ranked their supervisors are available for consultation as the highest (M-4.45). It is important for the supervisors to be available so that the students can see and seek their guidance. Many supervisors are always available when needed (Sidhu et al., 2014). As opposed to a study conducted by Simuforosa, Veronica, and Rosemary (2015) that revealed some supervisors are hardly available for consultations and keep postponing meetings.

Not only availability, but the supervisor must also be accessible and approachable (M-4.44). The finding of this study is in accordance with the study conducted by Naim and Dhanapal (2017) and Tahir et al. (2012) that stated supervisors are approachable. It will be easy for the students to see them if the students have problems. There are many ways to meet the supervisors in this era. Both the supervisors and students can discuss and use suitable ways for the supervision. Students can approach the supervisors via face-to-face, email, telephone, or Internet (Djamila & Makinda, 2016; Derounian, 2011).

Although the supervisor guides the students effectively (M-4.30), the supervisor did not really praise their good performance (M-4.24) or reprimand them for their bad performance (M-4.21). Supervisors should not only guide but also support and motivate the students as motivation is very pertinent in the supervisory process (Halim et al., 2014). Motivation can boost the students' self-esteem and it will make them perform better. The supervisors can encourage and be firm where necessary (Derounian, 2011). Both praise and reprimand are

necessary in the supervisory process because indirectly they are a form of feedback for the students to know their performance, either good or bad.

Students' Perceptions of the Role of the Supervisors

Supervisors are also important in this supervisor-supervisee relationship. The supervisors need to maintain professional relationships during the supervision (M-4.26). The finding is in accordance with Lessing's (2011) study where 72% of the respondents of the study claim that the supervisor-supervisee relationships should only be professional, and no personal relationship involved. Respondents in Tahir et al.'s (2012) study also declare that the most important element is that an effective supervisor should establish good and professional relationships with the student. A clear professional boundary must be maintained (Sidhu et al., 2014).

To the students, it is the supervisors' role to ensure FYP is completed on time (M-4.18). A study conducted by Sidhu et al. (2014) towards Malaysian students found that the supervisors need to help the students complete the research project within time. Furthermore, a study conducted by Lessing (2011) also revealed that 80% of the lecturers feel that it is their role as supervisors to support the students to complete within the minimum period given. With the right implementation of mentorship, students will not fall behind schedule (Halim et al., 2014).

Students still want to have a voice in deciding on the theoretical framework, methodology, and design of FYP (M-3.57), as well as the title for FYP (M-3.38). Students want to choose the title on their own because they want to feel that they are the ones who navigate the project. Students who choose their own topic makes them independent learners. Independent learners will ensure high standards of achievement (Zafar, Muhammad, & Anis, 2021; Djamila & Makinda, 2016). The students will be eager and excited to complete the project because they are the ones that proposed the project. It is based on their interest and ideas. So, it is also linked with motivation (Halim et al., 2014). Students will look for topics of interest, reading relevant articles, and/or preparing a research proposal before meeting their supervisors (Razali, Hawe, & Dixon, 2020).

Students' Perceptions of the Factors that Affect a Supervisory Process

The most prominent factors are supervisor's experience (M-4.13) and supervisor's expertise (M-4.11). Supervisors need to equip themselves with the latest knowledge and skills so that they can supervise the students better. When the supervisor's expertise, knowledge, and research skills match the student's FYP, the supervision will be effective. It is true in a study conducted by Naim and Dhanapal (2017), and Sidhu et al. (2014) that knowledge, expertise, and experience are important.

Supervisor's qualification is not as important as experience and expertise because it is ranked as the second lowest (M-3.76) in this study. It is in contrast with what Naim and Dhanapal (2017) found where qualification is important. The difference between the two studies is because of the sample. The former study involved students of Business Administration, International Business, International Business and Marketing, and Banking and Finance programmes. Meanwhile, the current study involves students of the Engineering programme. Students have to analyse, synthesise, and apply different areas of knowledge and skills to be a competent engineer in the future (Uziak, 2015). Thus, the supervisor's experience and expertise are more important because the supervisors already experienced it before on the field, and hence can guide the students effectively.

The factor that does not affect a supervisory process according to students is the supervisor's gender (M-3.09). Regardless of whether the supervisor is male or female, gender does not give any impact to the supervision. It is also aligned with Naim and Dhanapal's (2017) study that found gender is the least factor that affects the supervisory process.

Implications in Teaching and Learning
This study provides positive implications that can improve the teaching and learning in supervision as different supervisor and supervisee have different expectations. To have an effective supervisory process, what to be expected should be made clear between the supervisors and supervisees from the beginning (Razali, Hawe, & Dixon, 2020; Derounian, 2011). The supervisors can help the students with everything and when needed relating to the research project (Zafar, Muhammad, & Anis, 2021; Doan et al., 2022).

Supervisors can give a variety of options to the students to meet them for consultations. It can be via face-to-face, online, telephone, or email. There are many platforms to meet online such as Google Meet and Microsoft Teams. The meeting can take place regardless of where the supervisors and students are. So, it will not be an issue in the supervisory process. The students can ask and make appointment with the supervisors prior meeting via WhatsApp or Telegram.

The supervisors also need to maintain a professional relationship with the students. They can be friendly but purely as supervisors and supervisees. Professional relationship is a must as to avoid any unwanted problems that may arise later such as bias and favouritism. The supervisors can praise or compliment the students when the students perform well. They can also reprimand the students when the students perform poorly. These are only done with the aim to guide and help the students to perform better and complete their FYP.

Time management is very vital. Students still need supervisors to assist them in managing their time wisely. Supervisors can help to monitor and keep track of the students' progress. The supervisors can also ask the students to make a timetable or gantt chart of the students' progress so that the students are aware.

In terms of deciding on the theoretical framework, methodology, design, and title of FYP, there are students who let the supervisors decide and there are students who want to do it by themselves. Discussion can be done between supervisors and the students to reach a consensus because the main role of supervisors is to guide and facilitate. Students who have the freedom to decide will feel that their voice is valued. They will be motivated to do and complete the task or research project because it is their responsibility.

Conclusion
Summary of Findings
It can be concluded that the students need their supervisors in the supervisory process to guide them. They perceived the supervisors to be available and approachable for consultation. The supervisors should also maintain professional relationships and ensure FYP is completed on time. It is also essential for the supervisors to have experience and be an expert in their field. On the contrary, the students also want to have the freedom to make decisions during supervision. The decisions involve theoretical framework, methodology, and design of FYP, as well as the title for FYP. Supervisors have to be aware of students' expectations on the supervisors' role in the supervisory process. Subsequently, the supervision will be smooth and effective.

Suggestion for Future Research

It is recommended that the research on supervision should be conducted with different samples in the future because this study only investigate based on one discipline only. Accordingly, different samples give different responses that produce intriguing findings. Furthermore, future research can also include qualitative data in the form of interviews with the students combined with the quantitative data from the questionnaire to know in-depth about supervision. It is also interesting to know on supervisees according to the students' themselves or their supervisors since the current study is about supervisees' perception towards their supervisors.

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