

# Enhancing Online Supervision Practice for Improving Final Year Industrial Based Project in Technical Programs



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## ABSTRACT

Online supervision is seen as a practical medium in connecting the student with their supervisor especially when the supervisors are away from the faculty. It is particularly during project-based supervision, input from supervisor is a must, but types of inputs have been unclear if interaction occurs in online mode. Therefore, this paper determines students' perception of social interaction needed in online supervision that was conducted via Facebook, e-mails and Skype, including the effective input from their supervisor. The result, important supports needed by the students are Project Input, Academic Input, Managerial Input, Technical and Innovation Input, and Interpersonal Input. Findings could guide the supervisor to provide useful information and guidance to their students to achieve effective supervision, as well as enhance the supervisory practices in order to promote fine products while improving the study completion rates.

**Key words:** Student-supervisor, exploratory factor analysis, online supervision, effective supervision.

## 1. INTRODUCTION

Over the past few decades, communication technology such as social media and internet had undeniably transformed the dynamics of interaction, interactivity and social relationships between students and supervisor. Directing the supervision process through face-to-face meeting involves bigger commitment while doing so by replacing this relationship through online medium is more facile. The supervision requires specific communication skills and feedback,

ineffective supervision practices would result in student failure [2]. Therefore, to control the frequency and commitment in supervision practice then it requires an appropriate and relevant tool.

The success of supervision practice is supported by the consistent interaction between student and their supervisor [3]. Moskvicevaa, Bordovskaiab and Darinskaya [4] explains that in a supervision practice, the interactions and contents of a discussion between student and their supervisor is important to ensure a meaningful supervision. A study conducted by Bender and Dykeman [5] found that traditional supervision and online supervision had same efficiency. This shows that, the quality of online supervision is similar to traditional supervision. This is because the key of a supervision practice is the subject matter discussed by student and their supervisor, whether it is via electronic media or traditional, it still refers to the mode of communication in supervision practice.

The development of supervision provision via electronic media requires a strong, project-based and good input towards its effectiveness. The student and supervisor's relationship that develops during this process is a valuable initiative to transform the education to long distance education. According to Carroll [6], essential components of ethical supervision comprises of assessment, evaluation, and feedback; thus, it should not be neglected even by using online medium. Supervision practice is the process of discussions between student and their supervisor to discuss various matters related to the research project from research planning, research process and final report of the research results [7].

Online supervision practice is important and relevant today [8], especially for technical and vocational education and training. This is to facilitate teaching prosecutions, providing guidance to a project based, and supervision in online supervision practices. Therefore, this paper primarily focuses on the interaction between student and their supervisor based

on the text-based communication like e-mail, simultaneous response chatting like Facebook or messenger and real video chat like Skype. This study is aimed to discover students' perception of social interaction needed in online supervision, including the effective input from their supervisor.

## 2. BACKGROUND AND PROBLEM STATEMENT

The effective supervision is underpinned by support, feedback, collaborative, honest, and a clear expectation for structure of empowering relationships [9]. Students will be given the prospect to enhance their potential development with effective supervision [10]. While Haberstroch and Duffey [11] found that, in Relational-Cultural Theory (RCT), supervision takes place in a variety of contexts, models of communication, culture and development that can be developed to adapt in online supervision. Other than that, RCT also can be developed to understand human relationships, power differentials the primary of context and the nature of development framework [12]. Ismail, Hassan and Masek [13] suggested that in order to enhance student's competency, supervisor should plan and give a time to create the online supervision. The effectiveness of a supervision, the student and their supervisor should have decent rapport and support each other such as support, motivation, guidance and inspiration consistent given by the supervisor. The success of communication in a supervision practice between student and their supervisor can be enhanced through trust, presence, empowerment and the recognition of success [14].

Besides that, using social networks becomes a trend in today's technology world because all the information are digitized in online perspective. The supervisor and the students need social networks to communicate in conveying knowledge to support a learning process [15]. The supervisor and the students interact in their own way some part formally and some other part informal in order to achieve their meeting target. According to Conn, Roberts & Powell [16], an interactive platform can be used in rationally and ethically to develop their capabilities'. While carried out online, a supervision can also have the quality because students and their supervisors also talk seriously via virtual media [17]. Several criteria should students and supervisor be fulfilled in order to optimize the benefit from the online supervision, these include the online navigation skills, basic typing and spelling skills, capable of self-expression in written word, capable of express ideas with non-verbal cues, and excellent in communication skills.

The data base linked to online supervision is still in its initial stages, even though, there are many significant researches have validated in many forms of online relationship. They are supervisors connect only on distance communications, while the others apply mix models that combine face-to-face with virtual communication [18]. Although students used e-mails for many supervision tasks, they be apt to e-mail supervisors with reflections on the interpersonal, cultural and emotional aspects. Supervisees seen online supervision satisfactorily and they appreciated flexibility, reduced expenditure and increased access that this medium offered [18]. The use of social media as a tool of this supervision demanding students to be more independent, showed a high interest in research

and develop their potential to complete the research [19]. In this case, the supervisor is to monitor student achievement.

In line with global progress, the importance of online supervision practice is increasingly urgent. Supervisor serves as a mentor directing student in conducting a research. Augustsson and Jaldemark[20], stated that, the difference online supervision focus on electronic draft and written communication but offline supervision are focus on physical and verbal communication. Supervision is relevant for those who are doing project or dissertation. In this regard, the quality and quantity of supervision practice are key of the success of a research project or dissertation[21]. Students and supervisor need to have a discussion which is scheduled and consistent [22]. During student and supervisor meeting, they discuss about their goal, aim, draft and progress. Crossouard[23] found that, there are changing in higher education course that influencing the teachers and students on computer-mediated communication and encouraged supervisors that also embrace online supervision. Online supervision through computer has interprets the intervention of both communication of oral and written.

Through various existing social media today, no more obstacles or excuses which causes a student does not provide a report and consultation related to the study. Online supervision includes Facebook, email and Skype. Pimmer *et al.* [17] suggests that, Facebook is an ideal tool for facilitating the student and their supervisor to communicate about research activities. Deane *et al.* [24] concluded that, skype is one of the best online communication tools to use for distance supervision. E-mail is the electronic media which has advantages for distance communications via voice mail or written correspondence [25]. In addition, social media has been developed rapidly to aid assessment of teaching and learning through the process of knowledge. Social media can also benefit supervisors and their students by emphasizing assessment as learning and assessment of learning [26]. It can be concluded that Facebook, email and skype have their own advantages depending on needs of the students and their supervisors in using the online tools.

## 3. METHODOLOGY

A survey study was conducted to 360 respondents who were selected through stratified random sampling technique from Malaysia Technical University Network (MTUN) institutions, namely Universiti Tun Hussein Onn Malaysia (UTHM), Universiti Teknikal Malaysia Melaka (UTeM), Unversiti Malaysia Pahang (UMP) and Universiti Malaysia Perlis (UniMAP). The total population for this research was 2645 students. Respondent were asked a series of questions regarding input need from their supervisor and the relationship that should occur during online supervision.

The questionnaire comprises of five constructs including Project Input (5 items), Academic Input (5 items), Managerial Input (5 items), Technical and Innovation Input (5 items) and Interpersonal Input (5 items). Items were developed and adapted from Lessing and Schulze [27], McAlpine and Norton [28] and Frick [29]. In order to find the agreement of the usefulness of online supervision, students also were asked 10 usefulness items regarding the experience in online

supervision. The participants were asked to provide their level of agreement on a 7-point scale (1=strongly disagree and 7 = strongly agree). Data screening were firstly embarked to remove uncompleted questionnaire, outliers, data missing, and tested for normality. Then, data were descriptively analyzed using frequency and percentage; next, Structural Equation Modelling was performed for the Goodness of Fit requirement.

**4. FINDINGS**

As a result, 370 questionnaires were managed to be collected, 10 of them were set aside uncompleted, remaining 360 for data analysis. A quick analysis using data analysis software, gender distribution was almost evenly distributed with 47% male (n=170) respondent than the female counterparts (n = 190). Majority of the respondents were from electrical engineering (n=125), civil engineering (n=87), information & communication technology (n=68), mechanical engineering (n=53) and others (n=27). In addition, 55% of the respondents indicated their preference and frequent of communicating using Facebook, 40% e-mails and 5% Skype for supervision.

Next, factorability among variables in this study was priority tested before Exploratory Factor Analysis (EFA) test was performed. In order to run EFA, the assumption was priority tested using Kaiser-Myer-Olkin (KMO) and Bartlett's test of Sphericity. The result; KMO index was 0.93, which was above 0.6 and Bartlett's test of Sphericity was significant, thus the data set was fit to run EFA (see Table 1). According to Kaiser and Rice [30], KMO value greater than 0.6 can be considered as adequate.

**Table 1:** KMO and Bartlett's Test

<b>Kaiser-Meyer-Olkin Measure of Sampling Adequacy.</b>		
		.930
<b>Bartlett's Test of Sphericity</b>		
Approx. Chi-Square	4141.305	
Df	300	
Sig.	.000	

Since this dimension is self-constructed items based on theory, an EFA was conducted as the supporting analysis for CFA. The regression analysis was also conducted and the probability of getting a critical ratio as large as 7.996 in absolute value is less than 0.001. Therefore, the regression weight for SIS in the prediction of

Technical Input is significantly different from zero at the p=0.001. The EFA analysis in Table 2 shows that 4 items were selected out of 5 to be the items in the dimensions and its grouped under the same factor. There are 4 final factors was defined in EFA analysis.

**Table 2:** Exploratory Factor Analysis for Supervisory Support

Item	Component			
	1	2	3	4
A2		.796		
A3		.601		
A4		.688		
A7			.560	
A8			.589	
A10			.767	
A11				.671
A12				.746
A13				.736
A21	.718			
A22	.813			
A23	.775			
A24	.740			

Table 3 shows that Project Input ( $\mu=4.19$ ) and Academic Input ( $\mu=4.14$ ) is the most important supports needed by the students and follow by Managerial Input ( $\mu=4.09$ ), Technical and Innovation Input ( $\mu=4.07$ ) and Interpersonal Input ( $\mu=4.03$ ).

**Table 3:** Rank of SIS

No.	Variable	Mean	Standard Deviation
1	Project Input (PI)	4.20	.58
2	Academic Input (AI)	4.14	.59
3	Managerial Input (MI)	4.09	.59
4	Technical and Innovation	4.07	.63
5	Interpersonal Input (IP)	4.03	.65

A total of 17 out of 20 items left for SIC throughout the first and second order analysis. The results indicate that the CFA model for SIC has sufficient and significant GOF at 0.05 level with AVE = 0.52 and CR = 0.95. The GFI, CFI and NORMEDCHISQ are all in acceptance range as in Table 4.

**Table 4:** Goodness of Fit value for the Model

Fit Value	Value
Chi Square	166.472
Df	61
GFI	0.932
AGFI	0.898
NNFI	0.928
CFI	0.944
RMSEA	0.069
NORMEDCHISQ	2.729
p-value	.000

Thus, the results had proved that all inputs are very significant for the students and important to be catered by the supervisor. Through online communication, these inputs should be given appropriately in coherent manners. The findings show that all variables are rated in the ‘Very Important’ level. Therefore, it can be concluded that all dimensions are important to this study. The component of supervisory input needs to be arranged properly to suit the implementation during online communication.

Frischer and Larsson [31] mentioned that, in the organization of supervision supervisors who lack of guidance and their deficiencies, were factors by as reasons for students to decide not to continue their education. This might have happened due to less contact with their students. By using online supervision, this issue could be overcome effectively. In addition, in the teaching and learning process, the presence of supervisors is very important in helping and understanding the students' need to supervise the project as well as expanding the potential of the student and producing good projects [32]. Furthermore, Hodza [33] stated that, the supervisor must be willing to make adjustments in the relationship process to meet supervisee learning needs. This includes attending consultations and setting up appointments with the supervisees. The flexibility of communication and continuous feedback can be done even the supervisor are away from institution. The result is displayed in Table 5.

**Table 5:** Usefulness of online supervision

No.	Item	Mean	Standard Deviation
1	The quality of work I do is increasing	4.53	0.76
2	It gives me more control over the work I do	4.23	0.78
3	I can get things done faster	4.54	0.63
4	Supports critical aspects	4.14	0.43
5	Increases my productivity	4.62	0.68
6	Improves my job performance	4.55	0.65
7	I can do more work than I should	4.67	0.84
8	Enhances my effectiveness on the job	4.53	0.76
9	Makes it easier to do my job	4.75	0.87
10	Useful in my job	4.31	0.69

Therefore, based on Table 5, this study found that the mean value of each item is greater than 4 or close to 5. It can be concluded that the respondents of this study “agree”, using online supervision. The quality of work I do is increasing, it gives me more control over the work I do, I can get things done faster, supports critical aspects, increases productivity, improves job performance, allows to I can do more work than I should, enhances effectiveness on job, makes it easier to do my job and overall, online supervision useful in job.

Basic skill in online navigation is a basic requirement to make this relationship happened and in a relatively short period of time, a person with at least some computer

background can set up online supervision. Student and supervisor should have skills to use electronic media [34]. With the absence of the non-verbal cues, the potential for miscommunication is great and can have quite an impact on this process. However, live streaming and video chatting are alternative to make real time discussion among them. On the other hand, abbreviations and certain characters in text or e-mails that are quite succinct can powerfully express feelings and add tone to the communication [35]. It's vital for the supervisors to be up to date with all software systems.

The study conducted by Kivunja [15] found that information facilities, media and digital technologies make supervision need to take advantage of various media and technology to facilitate the implementation of learning. Social interaction through online media has a role in helping the teaching and learning process in distance education [34]. Online supervision is a flexible medium and easy to be accessed to most of the students in today's Information Technology (IT) era. These findings support the results of the study Hamzah *et al.* [35], found that online supervision is the right medium for students and supervisors to share knowledge, information and progress of study. In online supervision, students and supervisors have freedom of ambience and location because this supervision can be done in any location and various situations, and only limited by internet access [36].

Hanadi [37] describes e-supervision as a web-based application and a natural complement to the use of distance learning technologies which enables a supervisor to perform supervisory duties at a geographical distant location. Similarly, Hanadi [37] opines that e-supervision aims to give the supervisors (Lecturers) accessibility, continuous and open support to their supervisees (students) which will reduce their stress. Albar [38] states that e-supervision offers a way of overseeing the supervisee at geographically distant sites. It can also be considered as virtual supervision where supervisors are connected to the scattered supervisees virtually.

The E-Supervision process aimed to creating an educational collaboration environment between supervisors and teachers which include acquiring more skills, experiences, attitudes, and teaching strategies and others [37]. In the other side, it aims to give the supervisors reachness, continuous and open support to their teachers which will relieve their task stress and less daily time through communicating with teachers through E-Supervision system. It is also need to ensure that teachers have sufficient time allocated to undertake the system of supervision of supervisors [39].

This study suggests that there are five (5) important supervisory inputs that need to be taken into account while using online communication for supervision purposes which are Project, Academic, Managerial, Technical & Innovation and Interpersonal. These findings support the Bengtson & Jensen [40] found that the online supervision need to combine aspects of concept, content and form of communication between student and their supervisor. The findings of this study support the study Clark and Haddock [36] which indicates that online supervision can increase the effectiveness of a job and increase productivity both student and their supervisor. However, the results of this study in line

with Martin, Kumar and Lizarondoc[25] concluded that online supervision useful in job and improves the quality of the work and enhance student's motivation [42].

## 5. CONCLUSION

Even though there is no specific practice or style in supervision, the demand for effective supervision is increasing, hence, this study expressed that the students are looking for the best information and supervisor to guide them through out their studies. Despite the challenge now is how to incorporate these supervisory inputs during online supervision activity, this study shows that there are usefulness of online supervision including improves the quality of the work, productivity, effectiveness on job and job performance, enables to accomplish tasks more quickly and more work than would otherwise be possible, gives greater control over work, supports critical aspects, makes it easier to do the job and overall, online supervision useful in job. Findings of this study will be useful to enhance the supervisory practices in order to promote fine products while improving the completion rates of students. Also, the management should take some steps to consider online supervision as an alternative during student's project. Proper infrastructure and fast internet or communication line should be provided in the campus. Social interaction through online media should not be neglected as compared to face to face meeting. The implementation of these inputs could develop the student's ability and enhance their performance so that it could benefit both the student and the supervisor. It is hoped that the findings could guide the supervisor to provide useful information and guidance to their students to achieve effective supervision.

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