

Key Factors Influencing Graduation on Time Among Postgraduate Students: A PLS-SEM Approach

Priyadarshini Muthukrishnan^{1*}, Gurnam Kaur Sidhu², Teoh Sian Hoon³, Geethanjali Narayanan⁴,
Chan Yuen Fook⁵

¹Department of Education, Department of Education, HELP University, Selangor.
Priyakrishnan.mail@gmail.com

² Faculty of Education, Languages & Psychology, SEGi University, Selangor.
gurnamgurdial@segi.edu.my

^{3,4,5} Faculty of Education, Universiti Teknologi MARA, Selangor.

tehsian@uitm.edu.my

geetha@uitm.edu.my

yuenfook@uitm.edu.my

*Corresponding Author

<https://doi.org/10.24191/ajue.v18i1.17169>

Received: 29 August 2021

Accepted: 5 January 2022

Date Published Online: 31 January 2022

Published: 31 January 2022

Abstract: The information age witnessed the democratisation of education with an exponential growth in the enrolment of postgraduate students in almost all universities around the world. However, high attrition and low completion rates among students have been an immense threat to the key performance of the university system. The main purpose of this study was to investigate the influence of institutional support, supervisory practices, and students' self-management and research skills on postgraduate students' motivation to graduate on time (GOT). The data were collected from 191 postgraduate students from three universities in Malaysia using a survey questionnaire. The quantitative data were analysed using the PLS-SEM approach. The results revealed that research skills, institutional support and self-management skills significantly influenced the postgraduate students' motivation to GOT. Furthermore, research skills were identified as the strongest predictor of the motivation to GOT. Additionally, research skills mediated the relationships between institutional support, students' self-management skills and postgraduate students' motivation to GOT. However, supervisory practices toward GOT were not supported either by direct or indirect effect. The study has far reaching implications for the postgraduate students, supervisors, and institutions of higher learning.

Keywords :

1. Introduction

The Research and Development initiatives at universities' levels, especially in the postgraduate programmes have significantly contributed to the knowledge-based society and therefore many universities are actively promoting their postgraduate programmes. Consequently, there has been an upsurge in the influx of graduates' enrolment across all universities. Graduation is the capstone in the postgraduate (PG) research journey, hence postgraduates need to engage themselves in an immersive research environment so as to complete their thesis and graduate on time. Ensuring programme completion and timely graduation are the most common pressing concerns in Institutions of Higher Learning (IHL). However, for many PG students, graduation on time is rather an illusion than a reality. In addition, the attrition rate among postgraduates is comparatively higher than the undergraduates in most Malaysian Research Universities. While one in thirteen students turned out to be dropouts in

undergraduate programmes, one in five dropped out from the master and PhD programmes (MOHE, 2016) which indicates the challenges students face during the PG programme. The current attrition rate largely affects student and institutional outcomes. In most cases, there is a complex web of factors related to failure to GOT which include psychological and environmental factors. Furthermore, there is an undeniable fact that a lot of expectations and requirements are heavily placed on students who embark on research-based programmes. The students are expected to be involved in collaborative and innovative research projects and contribute new knowledge in their respective discipline. Nevertheless, the identified factors which affect the students' motivation towards completion are more important since it can provide early detection of GOT. Hence, the current study primarily focused on investigating the factors which affect the postgraduates' motivation towards GOT. Specifically, this study examined the student, supervisor and institutional factors which influence the students' motivation to GOT.

2. Literature Review

Numerous studies have acknowledged the complex web of factors affecting programme completion which are attributed to interpersonal (Tinto, 2006; Dziuban et al., 2013), environmental, social and cognitive factors (Dziuban et al., 2013). Carroll, Ng and Birch (2009) highlighted three critical factors for the non-completion of programme by PG students. These factors are situational factors, particularly related to students' life; dispositional factors which are related to students' beliefs, attitudes, values, and institutional factors which are related to the policies, procedure and structure within the university. Similarly, this current research also focussed on three major factors: student, supervisor and institution. Further, the student factors such as self-management and research skills were studied.

2.1 Postgraduate Education in Malaysia

The quality of higher education in Malaysia has shown a steady rise which brought an increased demand from students on the quality of education offered at the IHL. In the Malaysian post-graduate scenario, there has been a ten-fold increase in the number of postgraduate students from 1990 to 2010 (MoE, 2015). The Ministry of Higher Education has targeted to produce 60,000 quality doctoral graduates by 2023. One such initiative towards a knowledge-based economy and in enhancing the research and innovations in the country is the MyBrain 15 programme, which provides scholarships for the postgraduate studies. Remarkably, the high influx of graduate students has resulted in the significant expansion of research and developments in the IHL. Consequently, an intense escalation in research outputs to threefold and citations to four-fold was recorded between 2007 and 2012 in Malaysia (MoE, 2015). Besides, the students' completion of the programme within the stipulated time is a potential key performance indicator for universities. To measure the university key performance in terms of students' enrolment and graduation, the most used measurements are the attrition rate, graduation rate, graduation on time (GOT) and intakes' graduate on time (iGOT) (MOHE, 2016). GOT refers to the timely completion of the programme within the expected duration of the study. The GOT percentage is the ratio of the number of students' graduate from a particular intake of students and number of students enrolled in the year excluding the dropouts. The MOHE (2016) highlighted the intakes' graduation on time (iGOT) and the annual cost per full-time student are equivalent as the two key levers in grading the quality of academic productivity of the universities (MOHE, 2016). Graduation on time largely affects the outcomes of the student, supervisor and the university. Dropouts, prolonged study period or incompleteness of programmes are considered as loss in terms of funding and human capital (Styger, Vuuren & Heymans, 2015). Therefore, it is vital to monitor the students' progress and motivate them to complete the programme on time. Hence, this research is focussed on the factors which foster motivation among PG students to sustain in their academic programme and complete the programme on time.

2.2 Student Factors

Students are the key players in the successful completion of their studies and their persistent effort is vital to graduate on time (Eyangu, Bagire & Kibra, 2014). Siamian, Mahmoudi, Habibi, Latifi

& Zare-Gavani (2016) succinctly pointed out that students with a relatively high level of perception of awareness towards the challenging academic life were able to develop better academic and non-academic related skills and were successful in the submission of their thesis. However, a substantial number of studies have investigated the factors affecting the graduate students' thesis completion and concluded that graduate students were constantly facing multiple challenges in their research journey. A recent study by Vasugi and Hassan (2019) reported that postgraduate students from a Malaysian public university displayed a moderate level of stress, anxiety and depression. Numerous studies highlighted a range of issues and barriers faced by postgraduate students which were primarily related to attitude (Siamian et al., 2016), thesis writing skills (Hoon et al., 2019), psychological factors (Tinto, 2006), family (Girves & Wammerus, 1988) and finance (Mbogo, 2016). In addition, it was identified that graduate students had encountered intensive personal problems which was the highly rated constraint in thesis completion (Russell, 1996). In a similar vein, Hadi & Muhammad (2019) concluded that graduate students' personal factors largely influence their research progress. This confirmed that students undergo a myriad of personal and research related challenges during the period of postgraduate study and they need to manage and overcome these challenges to GOT. In this study, the term self-management was operationalised as the PG students' abilities in managing personal and academic problems. Therefore, graduate students need to develop readiness, skills, and positive outlook towards their academic challenges. Hence, it can be hypothesised that:

H1a: Self-management skills are positively related to research skills of postgraduate students.

H1b: Research skills are positively related to motivation to graduate on time.

H1c: Self-management skills are positively related to motivation to graduate on time.

H4a: Research skills mediate the relationship between self-management skills and motivation to graduate on time.

2.3 Institutional Support

The role of an institution has been recognised as a crucial factor in the completion of postgraduate studies. The literature has referred the term for institutional support as the availability of academic resources, student support system and guidance both in-campus and on-line (Rubin, Fernandes & Avgerinou, 2013) and the opportunity for creating a learning community. Several studies have reported that the issues faced by postgraduate students in Malaysia were due to lack of facilities in library services, which subsequently affect the research progress of the postgraduate students. Many supervisors have reiterated the concern over the lack of institutional support and the need for better institutional services and practices to be available for postgraduate students' research work (Sidhu, Lim & Chan, 2017). Therefore, the following hypotheses were formulated to guide the study:

H2a: Institutional support is positively related to research skills of postgraduate students.

H2b: Institutional support is positively related to motivation to graduate on time.

H4b: Research skills mediate the relationship between institutional support and motivation to graduate on time.

2.4 Supervisory Practices

Supervision is conceptualised as a complex and multidimensional task where one-to-one conscious interaction occurs between the student and the supervisor with mutual respect, collegiality, professionalism and open-mindedness. The supervisor-student relationship is viewed as a symbiotic relationship in a professional environment for mutual benefits. Research supervision involves academic expertise and skilful management of interpersonal and professional relationships. Whilst many factors contribute to PG students' programme completion, one of the potential factors which is widely scrutinised is supervisory practices. Abiddin, Ismail and Ismail (2011) have reported that having a good relationship with supervisors is important for students' study progress and successful completion of research projects. Mhunpiew (2013) viewed supervision as a system which constitutes supervisors to offer five desirable supports to their supervisees viz., technical, intellectual, administrative, management, and personal support. Other than the epistemic domain of knowledge and skills, the affective qualities are considered vital for supervisors. The supervisors' non-authoritative approach with respect and empathy; persistent support and encouragement as an academic advisor; keeping up the

students' self-respect and morality (Phillips & Pugh, 2000); being sensitive to students' needs (Brown & Krager, 1985), pastoral care and support (Cryer, 2006), and good communication skills (Haksever & Manisali, 2000) are the affective qualities that ease the supervisory practices. In literature, there were substantial number of studies which have analysed the role of supervisory practices on thesis completion and students' performance (Hadi, & Muhammad, 2019; Azman, Nor, & Aghwela, 2014; Kunle, 2021; Habibah, 2016;). However, little attention has been paid to study the relationship between supervisory practices to enhance the research skills of the students and their influence on the students' motivation to graduate on time. In the present study, the construct of supervisory practices was operationalised as providing necessary research guidance to PG students to persistently support, sustain and push them towards completing the programme. Therefore, the current study has formulated the following hypotheses:

H3a: Supervisory practices are positively related to research skills of postgraduate students. H3b: Supervisory practices are positively related to motivation to graduate on time.

H4c: Research skills mediate the relationship between supervisory practices and motivation to graduate on time.

3. Research Methodology

The current research employed a cross-sectional research design and used quantitative methods to analyse the relationships between the independent and dependent variables of the study.

3.1 Sample for the study

The population for the current study were the postgraduate students pursuing master and doctoral programme in three universities located in Selangor and Klang Valley in Malaysia. The participants responded to the survey questionnaire and the empirical data were used to test the hypotheses proposed in the study.

3.2 Measures

The research instrument for the study were developed and validated by the researchers. The items were selected from the various available survey instruments and the items were validated by three experts. In this study, the items for the variables were adapted from the Postgraduate Research Experience Questionnaire (Marsh, Rowe & Martin, 2002), Postgraduate Supervisee and Postgraduate Supervisors' Questionnaires (Sidhu et al, 2013) and postgraduate motivation questionnaire (Igun, 2010). The questionnaire used in the present study had two sections, A and B. The responses were collected using a self-administered questionnaire which used a five-point Likert scale, with the responses ranging from strongly agree (1) to strongly disagree (5). Section A was intended to collect the demographic data of the participants while section B comprising of research skills (6 items), self-management skills (4 items), supervisory practices (4 items), institutional support (4 items) and motivation to graduate on time (4 items) explored the variables involved in the study. To ensure the content and construct validity, the questionnaires were pre-tested on five significant research students studying at public and private universities. The questionnaire was improved based on their feedback. Further, a pilot test in which a total of 50 respondents equally from public and private university participated in the survey. For the final study, 225 survey questionnaires were distributed, and 204 participants returned the survey. Data cleaning procedures as suggested by Field (2013) were followed to screen the data prior to data analysis which includes identifying the outliers on the ground of standardised factor scores using Smart PLS. After excluding the error cases from the dataset, the final sample size of 191 was considered for the study. A response rate of 84.44% was achieved in the data collection.

3.3 Data Analysis

To analyse the proposed research model, Partial Least Squares Structural Equation Modelling (SEM- PLS) using Smart PLS 3.0 software was employed. The current study is predictive oriented

which assessed how well the endogenous variable, motivation to graduate on time could be predicted by the exogenous variables (supervisory practices, self-management skills and research skills of students and institutional support).

4. Findings

The demographic profile of the participants showed that 25.7% (49) of the students are male, while the remaining 74.3% (142) of them are females. With regard to the programme of study, 33.6% (64) of the participants were enrolled in Masters by coursework or mixed mode, 29.8% of them were in Masters by full research and 36.6% (70) of them were doing Ph.D at the time of data collection. Anderson and Gerbing (1984) recommended two-step approach to test the proposed model. In the first step, the measurement model is assessed which is followed by the assessment of the structural model. Further, bootstrapping procedure was employed for 5000 samples to test the significance of the path coefficients and the loadings (Ringle, Da Silva, & Bido, 2015).

4.1 Assessment of measurement model

To assess the measurement or the outer model, the first step is to conduct the Confirmatory factor analysis (CFA) through PLS. Subsequently, the reliability and validity measures of the items are tested to confirm the measurement model. To achieve the reliability, internal consistency reliability which ensures the consistency in the measurement of the reflective items should be tested. In addition, the items need to be tested for the convergent and discriminant validity (Sekaran & Bougie, 2010).

4.1.1 Internal Consistency Reliability

The individual item reliability is assessed based on the standardised factor loadings of the items on their respective variable. Reliability of the instrument in this study was established using Composite Reliability (CR) and Cronbach's alpha coefficients. Construct reliability measures the extent to which the reflective items are consistent in measuring what it intends to measure (Roldán & Sánchez-Franco, 2012). According to Hulland (1999) the standardised factor loadings need to be larger than 0.7, which entails that more than 50% of the variance can be explained by the variable. Few items that did not satisfy the factor loadings criteria were deleted, and the final items that have acceptable outer loadings and have passed through this stage is shown in Table 1. The other assessment criteria to ensure the internal consistency reliability is to obtain acceptable values for the Composite Reliability (CR) and Cronbach's alpha coefficients. CR measures the level to which the items reveal the latent constructs. The recommended value for CR should be between 0.70 and 0.90 (Ramayah et.al, 2018). Values greater than 0.90 is a threat to the validity of the instrument because this confirms that the indicators are measuring the same phenomenon. Inter- item consistency of the item is estimated using Cronbach's alpha value which need to be greater than 0.70 (Hair et al., 2017). Based on the findings of this study, the CR and Cronbach alpha values of the indicators revealed values above 0.70 and less than 0.90 and these scores confirms the internal consistency of the measurement scale used in the study. The values are displayed in Table 1.

4.1.2 Convergent validity

Convergent validity is a measure of the degree to which individual indicators converge and reflect a construct in comparison with indicators of other constructs (Urbach and Ahleman, 2010). To ensure the convergent validity, the Average Variance Extracted (AVE) is calculated. AVE captures the variance by the indicators relative to the measurement error. The acceptable AVE measures should be greater than 0.50 variance (Hair et al., 2017). In the current study, the AVE for all the constructs ranged from 0.618 to 0.747, which were above 0.50, confirming the convergent validity of the measures. The results are shown in Table 1.

Table 1. Results of Convergent Validity for the Measurement Model

Constructs	Items	Convergent Validity				VIF
		Factor Loadings	ICR	CR	AVE	
Motivation to graduate on time	GOT1	0.855	0.792	0.866	0.618	2.071
	GOT2	0.815				1.962
	GOT3	0.752				1.492
	GOT4	0.715				1.347
Institutional support	IS1	0.828	0.835	0.889	0.668	1.79
	IS2	0.849				2.171
	IS3	0.835				2.178
	IS4	0.754				1.667
Research skills	RS1	0.825	0.811	0.831	0.694	2.502
	RS2	0.844				2.743
	RS3	0.843				2.384
	RS4	0.866				2.943
	RS5	0.851				2.833
	RS6	0.763				1.924
Self-management skills	SMS1	0.87	0.822	0.879	0.647	1.884
	SMS2	0.794				1.654
	SMS3	0.791				1.704
	SMS4	0.756				1.76
Supervisory practices	SP1	0.896	0.887	0.822	0.747	3.001
	SP2	0.83				2.03
	SP3	0.853				2.613
	SP4	0.876				2.222

4.1.3 Discriminant validity

Discriminant validity indicates the measure of distinctness of each construct from the other constructs of the study (Ramayah et al., 2018). To ensure discriminant validity of the constructs, three types of criteria should be fulfilled: cross loadings, Fornell and Larcker's and Heterotrait- Monotrait ratio of correlations (HTMT). The cross loadings criteria will be met if the loadings for each indicator are the highest for the selected construct. To achieve the discriminant validity, the square root of AVE values for all the constructs in the diagonal should be greater than the squared correlation with the other constructs in off-diagonal (Fornell & Larcker, 1981). An alternative method to analyse discriminant validity is by assessing HTMT, which is the proportion of correlations within the constructs to correlations between the constructs. HTMT ratio of correlation below 0.9 is acceptable to confirm discriminant validity of the constructs. Fornell and Larcker (1981) criterion is shown in Table 2 and the HTMT values are given in Table 3.

The discriminant validity values for the constructs under investigation showed acceptable values as shown in Table 2. The results in the Table 2 shows that square root of AVE for each construct: graduate on time (0.786), institutional support (0.817), research skills (0.833), self- management skills (0.804) and supervisory practices (0.864) are all higher than the correlation with other constructs in off-diagonal which proves the discriminant validity of the measures. The HTMT criterion for the variables is shown in Table 3 and all values are within the acceptable range.

Table 2. Results of Convergent Validity for the Measurement Model

Constructs	Graduate on time	Institutional support	Research skills	Self-management skills	Supervisory practices
Graduate on time	0.786				
Institutional support	0.392	0.817			
Research skills	0.467	0.315	0.833		
Self-management skills	0.319	0.133	0.217	0.804	
Supervisory practices	0.183	0.243	0.153	0.003	0.864

Table 3. Heterotrait- Monotrait ratio of Correlations Criterion

Constructs	Graduate on time	Institutional support	Research skills	Self-management skills
Graduate on time				
Institutional support	0.471			
Research skills	0.542	0.355		
Self-management skills	0.387	0.160	0.236	
Supervisory practices	0.210	0.271	0.168	0.123

4.2 Assessment of structural model

The inner or structural model explains the relationship between the latent constructs in the model (Hair et al., 2017). After evaluating the measurement model, the structural model has to be evaluated for the significance of the inner paths. Ramayah et al., (2018) insisted that it is important to check the lateral collinearity of the constructs. Similarly, Kock and Lynn (2012), noted that lateral collinearity might sometimes be misleading and create issues, although the criteria for discriminant validity are met. Furthermore, Variance Inflation Factor (VIF) is used to evaluate the lateral collinearity. Diamantopoulos and Winklhofer (2001), criteria for VIF is stringent and VIF value of 3.3 or higher is the indication for collinearity issues. In the current study, the VIF for all the indicators are below 3.3, and there is no issue of lateral collinearity observed. The VIF values are shown in Table 1.

Table 4 shows the effect of exogenous constructs on the endogenous constructs. The structural model is assessed using the R² values and the effect size f². According to Chin (1998), R² analysis is complementary to f². f² measures the change in R² if a specific endogenous construct is removed from the model. The coefficient of determination (R²) reveals the percentage of variation in endogenous construct explained by the exogenous constructs. The results indicated that the endogenous constructs research skills, institutional support and supervisory practices could explain 28.8% of the variance in motivation to graduate on time. Further, 13.8 % of the variance in research skills can be explained by self-management skills, institutional support and supervisory practices. The R² values are given in Table 4. The strength of R² value determines the predictive accuracy. Chin (1998) recommended criteria for R² value of 0.67, 0.33 and 0.19 represent substantial, moderate, and weak levels of predictive accuracy. Further, R² values higher than 0.10 is recommended to ensure that the variance accounted for an endogenous construct is adequate (Falk & Miller, 1992).

Table 4. Summary Result of the Coefficient of Determination (R²) for the Endogenous Constructs

Endogenous Constructs	R ²	t-value	p-value
Motivation to Graduate on Time	0.288	5.069	0.000
Research Skills	0.138	2.564	0.005

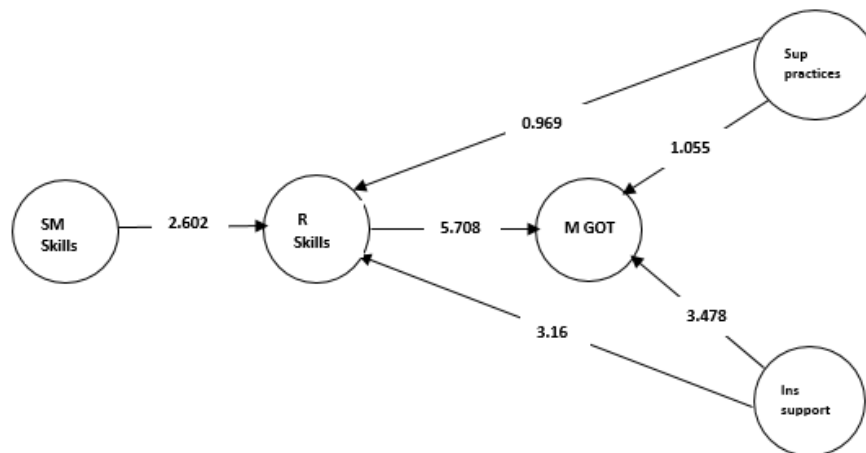
The relative impact of the predictors on the criterion construct is evaluated using the effect size f² (Cohen, 1998). The f² measures the contribution made by an exogenous construct in explaining the endogenous construct and is represented in term of R² (Ramayah et al., 2018). The f² values for large, medium and small effect sizes are of 0.35, 0.15 and 0.02 respectively (Cohen, 1998). The f²

values obtained for the present study variables are presented in Table 5, which showed that research skills have a moderate effect in explaining the R^2 for motivation to graduate on time. The effect size of institutional support, supervisory practices and self- management skills are very small.

Table 5. f^2 Effect Size

Constructs	Motivation to graduate on Time	Research skills
Institutional support	0.081	0.078
Research skills	0.177***	
Self-management skills		0.037
Supervisory practices	0.015	0.018

The structural model was evaluated and the path coefficients, t-values and p-values depicting the relationships between the constructs are presented in Table 6. The proposed hypotheses were tested by investigating the path coefficients resulted from SEM-PLS analysis. The results showed that the direct effect of self-management skills on research skills [$\beta = 0.181, t=2.602, p<0.005$], research skills on motivation to graduate on time [$\beta = 0.376, t=5.708, p<0.000$] were positive and significant supporting the hypotheses H1a and H1b respectively. Additionally, as expected, the relationship between institutional support and motivation to graduate on time [$\beta = 0.36, t=3.478, p<0.000$] and research skills [$\beta = 0.27, t=3.16, p<0.005$] were positive and significant and in turn supported the hypotheses H2a and H2b respectively. However, the study concluded that there was no significant relationship between supervisory practices and motivation to graduate on time [$\beta= 0.095, t= 1.055, p>0.05$] and research skills [$\beta= 0.087, t= 0.969, p>0.05$] and the hypotheses H3a and H3b were rejected. The assessment of the structural model and t-values are represented in Figure 1 below.



SM Skills: self- management skills; *R skills*: research skills; *M GOT*: Motivation to graduate on time; *Sup practices*: supervisor practices; *Ins support*: institutional support

Fig. 1 Assessment of structural model

Further, the influence of self- management skills on motivation to graduate on time through the mediation of research skills was positive and significant [$\beta= 0.068, t= 2.258, p<0.05$] supporting the hypothesis H4a. Likewise, the hypothesis H4b showing the relationship between institutional support and motivation to graduate on time [$\beta = 0.101, t=2.631, p<0.05$] mediated by research skills was positive and significant supporting the proposed hypothesis. However, the effect of supervisory practices on motivation to graduate on time mediated by research skills [$\beta = 0.33, t=0.97, p>0.05$] was non-significant and the hypothesis H4c was not supported.

Table 6. Hypothesis Testing

Hypotheses	Path coefficient	<i>t</i> value	<i>p</i> value	(95%) Lower Limit and Upper Limit	Decision
Total effects					
H1a: SMS -> RS	0.181	2.602	0.004	[0.095, 0.309]	Accepted
H1b: RS-> MGOT	0.376	5.708	0.000	[0.095, 0.309]	Accepted
H2a: IS-> RS	0.27	3.16	0.001	[0.121, 0.403]	Accepted
H2b: IS-> MGOT	0.36	3.478	0.000	[0.137, 0.381]	Accepted
H3a: SP-> RS	0.087	0.969	0.163	[-0.057, 0.24]	Rejected
H3b: SP-> MGOT	0.095	1.055	0.099	[-0.025, 0.171]	Rejected
Mediation effects					
H4a: SMS-> RS -> MGOT	0.068	2.258	0.012	[0.033, 0.125]	Accepted
H4b: IS-> RS -> MGOT	0.101	2.631	0.004	[0.042, 0.169]	Accepted
H4c: SP-> RS -> MGOT	0.033	0.97	0.161	[-0.023, 0.088]	Rejected

5. Discussion and Implications

First and foremost, this study proposed a predictive model for the motivation of PG students to graduate on time based on institutional support, supervisory practices, students' self-management and research skills. Secondly, this study sought to analyse the direct relationships between the independent factors and motivation to GOT. Finally, the mediating role of research skills were evaluated on the relationships between institutional support, supervisory practices, self-management skills and motivation to GOT. To conclude, the findings of the study were (i) there were direct and positive relationships between institutional support, research skills, self-management skills and students' motivation to GOT, (ii) research skills followed by institutional support were the potential factors toward motivating students to complete the programme within the stipulated time, and (iii) the relationship between supervisory practices and motivation to GOT was not supported either by direct or indirect path in this study. The results further confirmed that students rely strongly on institutional support in terms of research resources to enhance their research skills and to complete their thesis on time. The PG students were able to manage independently in seeking and gaining research related knowledge and skills. The role of the institution, particularly access to library resources has been widely acknowledged as a success factor in the completion of graduate research studies (Rasul & Singh, 2017). Contrastingly, Sidhu et al. (2013) reported that PG students in Malaysia were not satisfied by the institutional support and raised their concern for well-equipped research centres. The finding of the current study is aligned with the recent study by Rasul and Singh (2017) which confirmed that 90.1% of university students recommended the importance of library in facilitating research. In the same vein, Ali et al. (2013) reported that there is a direct relationship between resource-rich institution and students' performance. Also, accessibility to library services plays a prominent role to actively engage students in scholarly works and to complete their postgraduate studies.

Another notable finding from this study supported the conception that the students' ability to manage and overcome their challenges in their research journey will consequently assist them to complete their thesis on time. Equally, Papanastasiou (2005) supported the view which students need to build on a positive attitude and approach to be resilient and to overcome challenging times. Similarly, researchers have identified that students with high level of self-efficacy are resilient as compared to students with low self-efficacy who tend to misinterpret the reality and complicate the situation (Dinther, Dochy, & Segers, 2011). Besides, this study was also an attempt to determine whether supervisory practices help students to gain research skills and to motivate them to GOT. The findings demonstrated that supervisory practices did not contribute to students' research skills or to motivate them to GOT. Nonetheless, it is pertinent to be cautious in the interpretation of this finding. It is plausible to reason out that there is a wide gulf between supervisor and student, which might be attributed to the mismatched expectations and clashes due to psychological traits of both parties. Further, the findings vividly demonstrated that the supervisors might have high expectations and

stringent academic standards in thesis writing which might result in multiple revisions of their students' thesis work. The students might attribute their lengthy correction process to a prolonged study period. The findings are contrary to previous studies, which supported the notion that supervisors' performance is directly related to students' performance (Ismail, Abiddin, & Hassan, 2011; Arabaci & Ersözlu, 2010; Hadi & Muhamamd, 2019). Likewise, Soumana and Uddin (2017) reported that PhD students perceived their advisers as obstacles in their thesis writing process. Similar views were supported by Lynch, Salikhova and Salikhova (2018) as they confirmed that graduate students received minimal support, autonomy, and competence from their supervisors. Several plausible reasons bring insights into the non-significant relationship between supervisory practices and PG students' motivation to GOT. Primarily, supervision is considered as a complex and advanced form of pedagogical practice which is a joint effort by both supervisors and students in the creation of new knowledge. Further, supervisory tasks implicate multifaceted challenges to be tackled by both parties. Therefore, both supervisors and students need to be sensitive to each other and constantly adhere to the professional and ethical standards in communication, expectations, and responsibilities.

Earlier research studies have critically analysed the roles and responsibilities of supervisors in postgraduate studies and have shown evidence ranging from good or desirable to undesirable supervisory practices. Besides, a plethora of studies related to supervisor-student relationships have highlighted major concerns and issues in the supervisor-student relationship. From the supervisors' perspectives, the challenges encountered by supervisors are twofold. First, supervisors face challenges related to the academic and psychological aspects of their PG students, especially problems concerning limited research knowledge and skills. Several studies have also reported on the needs to enhance PG students' internal motivation (Lynch et al., 2018); research knowledge and skills (Ho, 2006), time management (Nzewi, Chiekezie, & Ikon, 2016); and academic writing skills (Jeyaraj, 2018). Second, supervisors need to attend to the enduring and overburdened academic, administrative and organisational responsibilities which demand their time and commitment (Abbidin et al., 2011). Therefore, it is rational to concur that the above two challenges could be the potential stressors for supervisors which hamper their supervisory practices, thus leaving negligible time for affective engagement during the supervision meetings.

From the perspectives of PG students, there are findings which stressed the difficulties that the students had undergone with their supervisors during their studies. The major concerns were related to their supervisors' lack of time, being away from the university (Spear, 2000); poor supervisory practices (Mouton, 2001); high supervisor-student ratio especially in the Asian countries and difficulties in meeting students' expectations (Abbidin et al., 2011). Nevertheless, a recent finding by Dericks (2019) highlighted that PhD students' satisfaction was primarily driven by supportive supervisors, notably when the supervisors extended their support in the non-academic aspects of students' life. Furthermore, PG students preferred people-oriented supervisors (Sidhu et al, 2013); sympathetic with a high level of patience and a good sense of humour to ease the confronting situations (Woolhouse, 2002). Therefore, the current study strongly recommends ways and strategies to promote and strengthen the supervisor-student interpersonal interaction and relationship. Indeed, it is pertinent to investigate the means to develop interpersonal skills and collegial relationship between supervisors and students. Moreover, to graduate on time, it is vital not to limit the supervisor-student interaction and engagement to cognitive aspects, but to incorporate aspects of affective engagement. In addition, universities should take effective measures, such as providing resourceful research facilities and workshops in sharpening their PG students' research skills.

6. Limitations and suggestions for future research

One of the notable limitations of the study was its sampling method. The samples were selected from three universities and these universities were not true representations of the universities across Malaysia. Besides, this study also lacked the investigation of other personal factors (family, financial, self-esteem) which might contribute towards the motivation to GOT. Another limitation of the study was the sample characteristics which included students from both master and PhD programmes as well as students from all years of study. Future study could be focused on a specific year and programme of study. It is noteworthy to conduct a longitudinal study to explore the nature of supervisor-student relationship throughout the period of the study. Another potential research area is to study the cognitive

and affective engagement in the supervisor-student interaction. Likewise, it will be interesting to conduct a comparative study to understand the supervisory practices and supervisor-student relationship between novice and experienced supervisors. One area which merits further research is to study the relationship between success factors of students who have completed their programme within the candidature time and the supervisor- student relationship.

7. Conclusion

In this research, we attempted to provide empirical evidence for the factors which determine the postgraduate students' motivation to graduate on time. Our results revealed that research skills, institutional support and self-management skills were the determining factors whilst the supervisory practices were not supported. In addition, the study demonstrated that research skills were the most potential motivational factor influencing programme completion within the candidature period. However, the influence of supervisory practices directly and indirectly on motivation to graduate on time was not supported, which lead directions for future research to investigate the affective engagement in the supervisor-student relationship. Overall, the study suggests the need for supervisors to attend to the psychological needs of their students and motivate them to complete their programme on time.

8. Acknowledgements

This study is part of a larger study, and the authors gratefully acknowledge the funding by the Fundamental Research Grant (FRGS/1/2016/SSI09/UITM/01/1) from the Ministry of Education, Malaysia and Universiti Teknologi MARA (UiTM) with the project code 600-RMI/FRGS 5/3(0057/2016). Also, the authors would like to express deepest appreciation to those who contributed directly or indirectly to the study. Also, the Publication Charge Support Grant from HELP University helped to partially offset the publication fees for this article and is gratefully acknowledged..

9. References

- Abiddin, N. Z., Ismail, A., & Ismail, A. (2011). Effective supervisory approach in enhancing postgraduate research studies. *International Journal of Humanities and Social Science*, 1(2), 206-217.
- Ali, S., Haider, Z., Munir, F., Khan, H., & Ahmed, A. (2013). Factors contributing to the students academic performance: A case study of Islamia University Sub-Campus. *American journal of*
- Anderson, J. C., & Gerbing, D. W. (1984). The effect of sampling error on convergence, improper solutions, and goodness-of-fit indices for maximum likelihood confirmatory factor analysis. *Psychometrika*, 49(2), 155-173.
- Arabacı, I. B., & Ersözülü, A. (n.d.). Postgraduate students' perceptions of their supervisors' mentoring skills. *Procedia-Social and Behavioral Sciences*, 2(2), 4234 – 4238. DOI: 10.1016/j.sbspro.2010.03.670.
- Azman, H., Nor, N. F. M., & Aghwela, H. O. M. (2014). Investigating supervisory feedback practices and their impact on international research student's thesis development: A case study. *Procedia-Social and Behavioral Sciences*, 141, 152-159.
- Brown, R. D., & Krager, L. (1985). Ethical issues in graduate education: Faculty and student responsibilities. *The Journal of Higher Education*, 56(4), 403-418.
- Carroll, D., Ng, E., & Birch, D. (2009). Retention and progression of postgraduate business students: An Australian perspective. *Open Learning: The Journal of Open, Distance and e-Learning*, 24(3), 197-209.
- Chin, W. W. (1998). Commentary: Issues and opinion on structural equation modeling. *MIS quarterly*, vii-xvi.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences—second edition*. 12 Lawrence Erlbaum Associates Inc. Hillsdale, New Jersey, 13
- Cryer, P. (2006). *The research student's guide to success*. McGraw-Hill Education (UK).

- Dericks G., Thompson E., Roberts M., & Phua, F. (2019). Determinants of PhD student satisfaction: the roles of supervisor, department, and peer qualities. *Assessment & Evaluation in Higher Education*, 44(7), 1–16. DOI: 10.1080/02602938.2019.1570484.
- Diamantopoulos, A., & Winklhofer, H. M. (2001). Index construction with formative indicators: An alternative to scale development. *Journal of Marketing Research*, 38(2), 269-277.
- Dziuban, C., Moskal, P., Kramer, L., & Thompson, J. (2013). Student satisfaction with online learning in the presence of ambivalence: Looking for the will-o'-the-wisp. *The Internet and Higher Education*, 17, 1-8.
- Eyangu, S., Bagire, V., & Kibrai, M. (2014). An examination of the completion rate of masters programs at Makerere University Business School. *Creative Education*, 5(22), 1913.
- Falk, R. F., & Miller, N. B. (1992). *A primer for soft modeling*. University of Akron Press.
- Field, A. (2013). *Discovering statistics using IBM SPSS statistics*. SAGE.
- Fornell, C., & Larcker, D. F. (2012). Equation algebra unobservable error: variables. *Journal of Marketing Research*, 18(3), 382-388.
- Girves, J. E., & Wemmerus, V. (1988). Developing models of graduate student degree progress. *The Journal of Higher Education*, 59(2), 163-189.
- Habibah, A. (2016). Personal Realities and the Apprenticeship of Supervising : My Tortuous Journey as a Supervisor. *Asian Journal of University Education*, 12(2).
- Hadi, N. U., & Muhammad, B. (2019). Factors Influencing Postgraduate Students' Performance: A high order top-down structural equation modelling approach. *Educational Sciences: Theory & Practice*, 19(2).
- Hair Jr, J. F., Matthews, L. M., Matthews, R. L., & Sarstedt, M. (2017). PLS-SEM or CB-SEM: updated guidelines on which method to use. *International Journal of Multivariate Data Analysis*, 1(2), 107-123.
- Haksever, A. M., & Manisali, E. (2000). Assessing supervision requirements of PhD students: The case of construction management and engineering in the UK. *European Journal of Engineering Education*, 25(1), 19-32.
- Hassan, N. C. (2019). Depression, anxiety and stress among postgraduate students in faculty of education of a public university in Malaysia. *Malaysian Journal of Medicine and Health Sciences*, 15(101), 90 – 95.
- Ho, J. C. (2006). What helps and what hinders thesis completion: A critical incident study. *International Journal of Existential Psychology and Psychotherapy*, 3(2), 117 – 132.
- Hoon, T. S., Narayanan, G., Sidhu, G. K., Choo, L. P., Fook, C. Y., & Salleh, N. N. B. M. (2019). Students' perceptions toward postgraduate study: A Preliminary Investigation. *International Journal of Education*, 4(30), 123-138.
- Huland, J. (1999). Use of partial-least squares (PLS) in strategic management research: A review of four recent studies. *Strategic Management Journal*, 20(2), 195 – 204. DOI: 10.1002/(SICI)1097-0266(199902)20:2<195::AID-SMJ13>3.0.CO;2-7.
- Ismail, A., Abiddin, N.Z., & Hassan, A. (2011). Improving the Development of Postgraduates' Research and Supervision. *International Education Studies*, 4, 78-89.
- Igun, S. E. (2010). Difficulties and motivation of postgraduate students in selected Nigerian universities. *Library Philosophy and Practice (e-journal)*, Paper, 369.
- Jeyaraj, J. J. (2018). It's A Jungle Out There: Challenges in Postgraduate Research Writing. *GEMA Online® Journal of Language Studies*, 18(1), 22 – 37. DOI: 10.17576/gema-2018-1801-02.
- Kock, N., & Lynn, G. (2012). Lateral collinearity and misleading results in variance-based SEM: An illustration and recommendations. *Journal of the Association for Information Systems*, 13(7), 546-580. DOI: 10.17705/1jais.00302.
- Kunle, O. (2021). Postgraduate Supervision: A Heuristic Approach to Learning, Unlearning, and Relearning. *Asian Journal of University Education*, 17 (4).
- Lynch, M. F., Salikhova, N. R., & Salikhova, A. (2018). Internal motivation among doctoral students: Contributions from the student and from the student's environment. *International Journal of Doctoral Studies*, 13, 255-272.
- Marsh, H. W., Rowe, K. J., & Martin, A. (2002). PhD students' evaluations of research supervision: issues, complexities, and challenges in a nationwide Australian experiment in benchmarking universities. *The Journal of Higher Education*, 73(3), 313-348.

- Mbogo, R. W. (2016). Antecedent Factors Affecting Academic Performance of Graduate Students at the Nairobi Evangelical Graduate School of Theology. *Journal of Education and Practice*, 7(18), 128-141.
- Mhunpiew, N. (2013). A Supervisor's Roles for Successful Thesis and Dissertation. *Online Submission*, 3(2), 119-122
- Ministry of Education, (2015). Malaysia Education Blueprint 2015-2025 (Higher Education).
- Ministry of Higher Education Malaysia. (2016). Enhancing Academic Productivity and Cost Efficiency: University Transformation Programme Silver Book.
- Mouton, J. (2001). *How to succeed in your master's and doctoral studies: A South African guide and resource book*. Van Schaik.
- Nzewi, H., Chiekezie, O., & Ikon, M. A. (2016). Time management and academic performance of postgraduate students in Nigerian Universities. *Review of Public Administration & Management*, 1(2), 180 – 192.
- Papanastasiou, E. C. (2005). Factor structure of the attitudes toward research scale. *Statistics education research journal*, 4(1), 16 – 26.
- Phillips, E. M., & Pugh, D. S. (2000). *How to get a PhD: A handbook for students and their supervisors*. Open University Press.
- Ramayah, T., Cheah, J., Chuah, F., Ting, H., & Memon, M. A. (2018). *Partial least squares structural equation modeling (PLS-SEM) using SmartPLS 3.0: An Updated Guide and Practical Guide to Statistical Analysis*. (1st ed). Pearson.
- Rasul, A., & Singh, D. (2017). The role of academic libraries in facilitating postgraduate students' research. *Malaysian Journal of Library & Information Science*, 15(3), 75-84.
- Ringle, C., Da Silva, D., & Bido, D. (2015). Structural equation modeling with the Smart PLS. *Brazilian Journal of Marketing*, 13(2).
- Roldán, J. L., & Sánchez-Franco, M. J. (2012). Variance-based structural equation modeling: Guidelines for using partial least squares in information systems research. In *Research methodologies, innovations and philosophies in software systems engineering and information systems* (pp. 193-221). IGI Global
- Rubin B., Fernandes R., & Avgerinou M. D. (2013). The effects of technology on the community of inquiry and satisfaction with online courses. *The Internet and Higher Education*, 17, 48–57. DOI: 10.1016/j.iheduc.2012.09.006.
- Russell, A. (1996). Postgraduate research: student and supervisor views. *The Flinders University of South Australia*.
- Sekaran U., & Bougie R. (2010). *Research methods for business: A skill building approach*. (5th ed). John Wiley & Sons
- Siamian, H., Mahmoudi, R., Habibi, F., Latifi, M., & Zare-Gavvani, V. (2016). Students' attitudes towards research at Mazandaran University of Medical Sciences in 2015. *Materia socio-medica*, 28(6), 468 – 472. DOI: 10.5455/msm.2016.28.
- Sidhu G. K., Lim P. C., & Chan Y. F. (2017). Developing a framework for postgraduate supervision,” in *Empowering 21st Century Learners Through Holistic and Enterprising Learning*, Springer, 255–267.
- Sidhu, G. K., Kaur, S., Fook, C. Y., & Yunus, F. W. (2013). Postgraduate supervision: Exploring Malaysian students' experiences. *Procedia-Social and Behavioral Sciences*, 90, 133-141.
- Soumana, A. O., & Uddin, M. R. (2017). Factors influencing the degree progress of international PhD students from Africa: An exploratory study. *Üniversitepark Bülten| Üniversitepark Bulletin*.
- Spear, R. H. (2000). Supervision of research students: Responding to student expectations. Retrieved from <https://openresearch-repository.anu.edu.au/handle/1885/26>
- Styger, A., Van Vuuren, G. W., & Heymans, A. (2015). Case study of postgraduate student dropout rate at South African universities. *International Business & Economics Research Journal*, 14(1), 1 – 14.
- Tinto, V. (2006). Research and practice of student retention: What next?. *Journal of College Student Retention: Research, Theory & Practice*, 8(1), 1-19.
- Urbach, N., & Ahlemann, F. (2010). Structural equation modeling in information systems research using partial least squares. *Journal of Information technology theory and application*, 11(2), 5-

40. Vasugi, S.R., & Hassan, N.C. (2019). Depression, anxiety and stress among postgraduate students in Faculty of Education of a public university in Malaysia.
- Dinther, M. V, Dochy, F., & Segers, M. (2011). Factors affecting students' self-efficacy in higher education. *Educational research review*, 6(2), 95-108.
- Woolhouse, M. (2002). Supervising dissertation projects: Expectations of supervisors and students. *Innovations in Education and Teaching International*, 39(2), 137-144.