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Soft-Skills Mediation between Procrastination and Academic Performance for Medical Students

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Abstract

Procrastination are known to have predominant roles in influencing the academic performance of students in different higher-education levels and disciplines. Thus it gained considerable research interest by educators and researchers. The main purpose of this study is to analyse the relationships between procrastination and academic performance for medical students and assess the degree played by students' soft-skills in managing the resultant conflict. Data was gathered from 196 medical students at different years through a self-administered survey from both male and female students. The students' responses to the survey questions were collected using point-scale measures and the descriptive statistics of these responses was performed using SPSS statistical package. Further, the partial least square approach is used to solve the structural equation modelling of the research and conceptual models using Smart PLS-SEM statistical package. The results showed that procrastination seems to have indirect effect on the academic performance. In search of potential mediators for this relationship, the analysis showed that the indirect relationship is mediated by the adoption of appropriate conflict management skills. The relationships of the mediator were all significant and showed that students adopting 'avoidance' as the conflict management strategy exhibit negative relationship with the academic performance. In this respect, the study suggest that successful application of students' soft-skills in managing conflicts will directly impact their academic performance. In addition of helping the universities to identify a key cause for procrastination, these results also support the universities' efforts to develop tailored awareness and educational programs to help students develop their soft skills for managing conflicts, which in turns will improve their academic performance.

Keywords: Procrastination, Academic Performance, Conflict Management, Soft skills

Introduction

Literature Review

When it comes to discussing time management, procrastination emerges as an important issue to consider. The first formal definition of procrastination believed to have emerged in 1751 in first Comprehensive English Dictionary by Samuel Johnson (1751). In general terms, procrastination is defined as "The folly of allowing ourselves to delay what we know cannot be finally escaped" (Janssem 2015). This phenomenon is specifically common in educational systems where students preparing for examinations or submitting assignments tend to delay their work until last minute. Worldwide statistical analysis showed that 80-95% of the students are engaged in procrastination process one way or another (O'Brien 2002, Ozer et. al. 2009). As much as 25% of students practicing procrastination think that their problem with is

chronic (Argiropoulou and Ferrari 2015). Other studies indicated that procrastination is increasing through the years, and people who have chronic procrastination may also have associated psychological problems such as low motivation, low self-esteem, depression, and low overall performance (Steel 2007).

In terms of the relationship with academic performance, there is a strong perception that procrastination impacts academic development one way or another. Many researchers have dedicated much of their time and efforts to analyse this relationship; see for example the comparative review by Kim and Seo 2015 where the metadata from 33 such studies was analyzed. Due to the complexity of the procrastination problem, no direct, unequivocal relationship can be posited between openness or intelligence and procrastination; in fact, some workers even suggested that such an attainment is not expected (Steel 2007). Nevertheless, many workers continued to explore and find ways to further understand the relationship between procrastination and academic performance. For example, several studies exhibited the presence of negative correlation between the academic performance and the level of procrastination were it was demonstrated that such a relationship is statistically significant and 39% negatively correlated (Lakshminarayan et. al. 2013). These findings confirm a much earlier study stating that procrastination has an adverse impact on the Grade Point Average (GPA), an academic achievement measure system, and people who do not procrastinate tend to score higher than those who do (Wesley 1994). This relationship is not confined to a particular academic discipline but rather to an extension of many disciplines including medicine.

Several studies attempt to understand the underpinning causes of procrastination, which proven to be a complex problem. For example, when procrastination is combined with students' competencies as two important factors to impact academic performance, the analysis of root causes can be segregated into three patterns: negative emotional procrastination, optimistic habits of procrastination and planned procrastination (Chu and Choi 2005). For academic performance, these categories are linked in the following ways: (a) negative emotions worsened the students' academic performance in an attempt to avoid failure, (b) optimistic pattern represents those with poor academic performance and hence little competence, and (c) the planning procrastination pattern with positive feelings are those students associated with favourable academic performance. With such data and impact on future career and performance of students, it is not surprising that procrastination has attained that much of attention from the research community and therefore educators believe that intervention is required to mitigate its negative impact. This is particularly prevalent in recent studies where some workers showed that procrastination interventions may help students better manage their study styles and time management behaviours. For example, it was concluded that individual coaching is an effective method in decreasing procrastination behaviour and enabling goal achievement (Losch et. el. 2016). Personal coaching managed to generate a high level of gratification and was more beneficial in assisting the examined sample accomplishing their objectives. On the other hand group training positively stimulated the acquirement of relevant knowledge. However, such practice is less applied at education institutions due to high cost and time consuming. In the situations where such practice was adopted, the results showed that being supported by a mentor/coach is more beneficial in setting and achieving long-term goals, which is relatively proportionate to the coach's leadership skills and motivation style. In this respect, inflexibility can be identified as one of the causes for people to procrastinate and accordingly it was concluded that an

acceptance-based behaviour intervention can be an effective intervention to support participants who favour improved academic performance (Glick and Orsillo 2015).

The link between procrastination and soft-skills or personality was also gained substantial interest in the literature. Relevant research consistently show that students personality play major role in predicating the academic achievements (see for example O'Connor and Paunonen 2007). In this respect, the personality factor of conscientiousness and its constituent narrow personality traits have been found to be especially relevant for the prediction of scholastic achievement. Regarding behaviour and attitude of students that deal with procrastination, the adopted resolutions tactic can be classified into three general approaches. The first approach is confrontational, where students directly face the problem with effective alternatives to solve it. The second is compromising, where the subject will accept an outcome that partially satisfies the intended objectives. The third tactic is avoidance; a type of denial to put off a conflict indefinitely and hopes the problem resolves itself. The current study focuses on the latter conflict management approach because of its anticipated drastic impact on academic performance. The medical students at Alfaisal University in the Kingdom of Saudi Arabia were selected to perform this study.

In addition to the relationship between procrastination and academic performance, another primary goal of the current study is to investigate the extent that adoption of avoidance strategy, as a conflict management approach, can be used to manage procrastination issues and influence the academic performance. For this purpose, a conceptual model that links these constructs is proposed and was tested using data gathered from medical students at different levels using a self-administered questionnaire. Therefore, in summary, the research problems this study intend to study and answer are:

To what extent procrastination influences the academic performance of students at medical schools?

To what extent adoption of conflict management approaches mediate the relationship between procrastination and academic performance?

Methodology

Assessment of the academic performance is known to be a complex problem to solve due to a multidimensional effect of different variables (see for example Rabin et. al. 2011; Kim and Seo 2015). In order to keep the problem simple, only two constructs were considered in this study. The first is the impact of procrastination on the academic performance and the second whether some type of mediation role is played by the adopted conflict management approach used by the students to resolve the consequences of procrastination. The starting point in managing this research was to develop a conceptual model that links the selected independent variables with the intended variables to be measured. This model is presented in Figure 1, where procrastination is impacting the academic performance through two possible routes, direct and indirect. The latter is achieved through mediation approach played by the conflict management style adopted by the students. The association of procrastination with conflict management in this study, is supported by the literature where procrastination is described as dysfunctional strategy used in an attempt to cope with conflict or choices (Mann 1982).

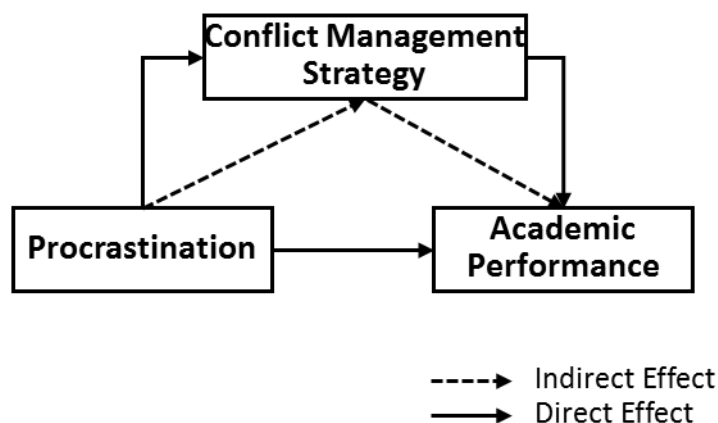


Figure 1. Conceptual diagram presenting the relationships between the constructs used for modelling the research problems.

Descriptions of the constructs used in the conceptual model are presented below:

University Academic Performance (GPA): in this research, the academic performance is measured in terms of the average GPA score. This technique is a commonly used method in similar researches (see for example Kim and Seo 2015). As the GPA is typically measured using one value, out of 4 or out of 5, then the inclusion of this construct has only one indicator, the GPA. In Smart PLS, as the used statistical package, constructs are allowed to have one indicator (Diamantopoulos et. al. 2012).

Procrastination (Procrast): many definitions are in use for procrastination (as stated in the above literature review). For this study, and in the context of academic performance, the term ‘procrastination’ refers to the tendency of students to delay the start of an activity (e.g. preparing for an exam) or delay a completion of an activity (such as submission of an assignment) to a degree until it becomes uncomfortable (Senécal et. al. 2003). Such practice is commonly followed by college students and can affect over 50% of the college students (see for example Solomon and Rothblum 1984; Ozer et. al. 2009). One possible reason for procrastination is more prevalent at the university rather than schools, this is because of the added flexibility and more relaxed times at the university (You 2015).

Problem-Avoidance (ProbAvoid): students using this approach are attempting to avoid direct confrontation with the time-management problem. In using this approach, the students are effectively sidestepping the issue and hope it will go away on its own. This is the least preferred conflict resolution approach as the underlying causes of the time-related conflict are still intact. However, the perception is that adopting such conflicting strategy only be used when other options are tried and were unsuccessful, or when the students come to a conclusion that no other options are feasible. In contrast, problem-avoiding approach is opposite to the problem-solving where students are expected to deal with the resultant procrastination conflicts by exploring the cause of the conflict and implement practical solutions to resolve the problem once and for all. However, problem solving approach require significant amount of self-confidence, maturity, and self-control abilities. In this study, the main reason for selecting problem-avoidance as a mediator instead of problem-solving is because students with high degree of procrastination are less likely to use problem-solving approach. The validity of such perception will be assessed in this study.

Samples and Statistical Approach

A set of survey questions in different time management and conflict management areas were developed using similar models in the literature or/and modified to suit the intended generation of self-administered survey. Some additional demographic information were also gathered for statistical purposes. A pre-test procedure with 10 students was performed to assess the clarity of the survey and time required to fill it. Some minor adjustments were made accordingly and a total of 250 surveys were distributed to the medical students at various levels and gender. The survey questions were answered by respondents on a seven-point Likert scale with 1 represents a 'Strongly Disagree' response, and 7 represents 'Strongly Agree' response. Data analysis was applied to the gathered responded data; each returned questionnaire was reviewed for completeness. 54 surveys were excluded due to large missed values or/and very low standard deviation which indicate disengaged respondents. Therefore, a total of 196 filled surveys were selected and considered for the analysis.

The quantitative analysis of the gathered data to assess the proposed conceptual model is performed using the structural equation modelling approach (See Hair et. al. 2016). SMART-PLS statistical package (version 3.2.4) was selected as the most suitable tool for such analysis due to (1) the research is exploratory in nature, and (2) use of constructs with single indicator (see Hair et. al. 2014; Sarstedt et. al. 2016). The interpretation of the PLS results is focused on explaining the degree that observed variance on the endogenous latent variables (dependent variables) can be attributed to exogenous variables (independent variables). Smart-PLS we applied via adoption of standard guidelines and principles in managing the structural equations calculations, see Vincenzo et. al. 2010, Hair, et. al. 2011; Hair, et. al., 2012; Penga and Lai 2012; Wong 2013.

The proposed conceptual model in Figure 1 was analysed using the structural equation modelling approach via SmartPLS. The selected constructs for the proposed model are modelled as reflective constructs aiming collectively to explain the observed academic performance, which is measured in terms of the GPA values.

Findings

The analysis approach of our model starts by assessing the measurements and structural models of the path diagram that was generated using the proposed conceptual model (Figure 1). For this purpose, practical steps were adopted based on the recommended methods of Hair et. al. 2016. In Figure 2, the path diagram linking the selected constructs, corresponding indicators, loads and the p-values of all relationships is shown. This path diagram was generated using the Smart-PLS statistical package.

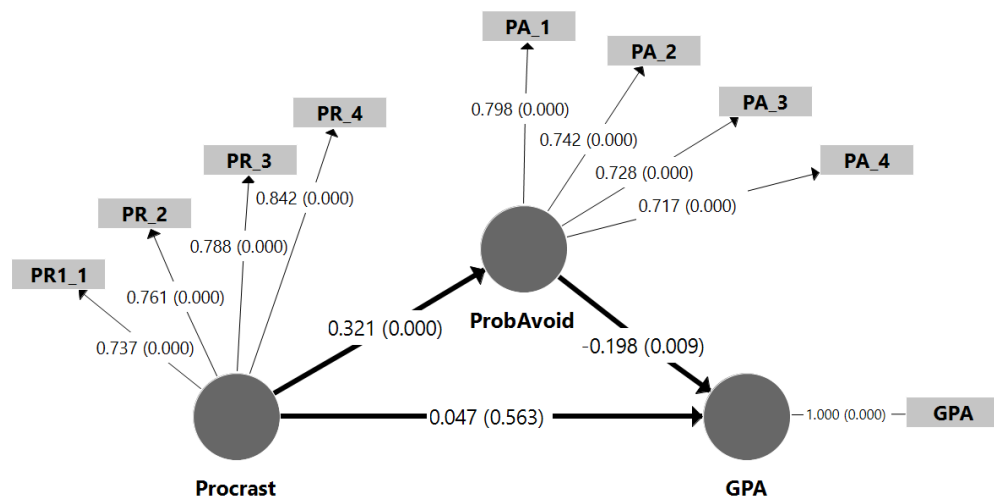


Figure 2. Path diagram showing the results for testing the conceptual model shown in Figure. 1.

We now turn into assessment of the dataset used to generate this path diagram. In Table 1, the basic descriptive statistics for the used indicators and their associated constructs are presented together with the assessment of the corresponding reliability and validity of the model.

Table 1

Summary of key properties for the reflective constructs of the outer models

Construct	Items	Loadings	Mean	Standard Deviation	Indicator Reliability	
Procrastination (Procrast)	PR_1	0.737***	4.439	1.925	0.543	
	PR_2	0.761***	4.571	1.832	0.579	
	PR_3	0.788***	5.015	1.68	0.621	
	PR_4	0.842***	4.403	1.878	0.709	
	<i>Cronback's Alpha</i>			0.792		
	<i>Composite Reliability</i>			0.865		
	<i>Average Variance Explained</i>			0.613		
Problem Avoidance (ProbAvoid)	PA_1	0.798***	3.189	1.66	0.637	
	PA_2	0.742***	3.281	1.644	0.551	
	PA_3	0.725***	3.337	1.705	0.526	
	PA_4	0.717***	2.781	1.702	0.514	
	<i>Cronback's Alpha</i>			0.740		
	<i>Composite Reliability</i>			0.835		
	<i>Average Variance Explained</i>			0.558		
Academic Performance (GPA)	GPA	1.0***	4.929	1.661	1.00	
	<i>Cronback's Alpha</i>			1.00		
	<i>Composite Reliability</i>			1.00		
	<i>Average Variance Explained</i>			1.00		

The endogenous variables of the research model shown in Figures 1 and Figure 2 (ProbAvoid and GPA) are measured using the indicators of the reflective constructs. As can be seen from Table 1, all the relationships between the indicators and the constructs have loading above the threshold value of 0.7 (Hair et. al. 2016) and all of them are significant (with p values less than 0.000). The assessment of the model's performance was achieved by measuring the Cronback's alpha and the composite reliability which both show values greater than the threshold value of 0.7 and meet the minimum average variance extracted (AVE) of 0.5 (Hair et. al. 2012). These results facilitate proceeding to analyze the discriminant validity of the model which can be performed in two ways: assessment of the cross loading values and the application of Fornell-Larker criterion (Hair et. al. 2016).

Table 2 presents the loadings of all indicators with the constructs used in the model. It can be clearly seen that each of the construct has the highest loadings with its own block compared with indicators belong to blocks of the other constructs.

Table 2

Cross loading analysis of model's indicators with the all constructs used in the model

Indicators	Procrast	ProbAvoid	GPA
GPA	1.000	-0.183	-0.016
PA_1	-0.130	0.798	0.324
PA_1	-0.159	0.742	0.159
PA_1	-0.184	0.728	0.221
PA_1	-0.069	0.717	0.221
PR_1	-0.107	0.224	0.737
PR_1	0.037	0.200	0.761
PR_1	0.011	0.232	0.788
PR_1	0.006	0.322	0.842

In addition to Table 2, Fornell-Larcker criterion analysis and the heterotrait-monotrait ratio (HTMT) were used to assess discriminant validity. These techniques confirmed the findings of Table 2, and further give evidences of the discriminant validity of the model, i.e. the constructs are distinct from each other and unique in terms of capturing specific data characteristics not represented by other constructs. To complete the evaluation of the model, the structural model was assessed using procedures of Hair et. al. 2016. We first assess the collinearity to establish whether the exogenous latent variables exhibit a degree of collinearity that influence the prediction of the endogenous variables. This process is conducted by measuring the Variance Inflation Factor (VIF), where all the VIF values are well below the cut-off value of 5 (Hair et. al. 2011).

The values of the path coefficients between the constructs of the structural model are shown in Figure 2 together with their significance. This shows that Procrast has weak non-significant relationship with the GPA ($\beta=0.0047$ and $p=0.563$), i.e. procrastination seems to have no influence on the academic performance. On the other hand, procrastination was found to have significant indirect relationship with the academic performance through the adopted strategy for managing conflicts. This is shown in the model via (1) the path linking Procrast and ProbAvoid is positive and significant ($\beta=0.321$ and $p<0.000$) and the path that links ProbAvoid with GPA is negative and significant ($\beta=-0.195$ and $p<0.01$). Such situation provide strong evidence that mediation is taking place on the relationship between procrastination

and the academic performance which should be analyzed to estimate the strength and type of such mediation. The data presented in Table 3 shows that the condition for the application of mediation effect was met because the indirect relationship is not significant (Hair et. al. 2016). These results shows the problem-avoidance as a conflict management strategy fully mediate the relationship between procrastination and academic performance.

Table 3

Significance analysis of the direct and indirect effects for the mediating construct

Path	Relationships	Path Coefficient	95% Confidence Interval of the Effect	t-Value	Significance (p<0.05)?
<i>Procrast</i> > <i>GPA</i>	Direct	0.047	[-0.132, 0.212]	0.549	No (0.583)
	Indirect	-0.062	[-0.003,-0.113]	2.267	Yes (0.015)

The next step in evaluating the structural model is by assessing the target construct's percentage of variance explained (R^2). The path diagrams shows that only 3% of the observed variance in the academic performance (GPA) is explained by adopting procrastination as the time management approach by the students. The Stone-Geisser criterion for assessing the model predictive relevance was performed using blindfolding procedures to calculate Q^2 values. All values seems to be greater than the threshold value of 0.00 indicating the model has required predictive relevance (Henseler et. al. 2009). Inspecting the corresponding q^2 values, indicate that the q^2 effect size can be considered as moderate.

All above assessments of the measurement and structural models suggest and confirm the quality of the structural model, thus we proceed to analyzing and discussing these findings in the next section.

Discussion

Assessment and quantification of the underpinning causes of academic procrastination is a complex problem and have gained much dedicated research and publications (see introduction section for list of literature review and the list of references). In terms of performance, which is the topic of this paper, procrastination is expected to have negative impact on the academic performance because it impacts the ability of students to complete academic assignments and meet academic achievement expectations (Rotenstein et. el. 2009). Therefore, students practicing procrastination as a mean of time management, are expected to achieve less academically compared with those who perform their assignments and course work on-time (assuming quality is controlled). The results of this study showed that only 3% of academic performance is explained by procrastination and that the relationship between procrastination and academic performance is not significant ($\beta=0.047$, and $p=0.563$). These results suggest that procrastination has very little to do with academic performance.

For comparison, the literature seems to have rather inconsistent data on the relationship between procrastination and academic performance but generally support that procrastination has negative impact on the academic performance when quality is controlled (Kim and Seo 2015). On other hand, use of self-reporting seems to interfere and alter such relationship. These results are not surprising, as academic procrastination ultimately results in delaying the submission of assignment which

impacts performance specifically for courses based on continuous assessment (Orpen 1998). On the other hand, others researchers showed that procrastination carry no relation to the GPA (Lay 1986; Lay and Schouwenburg 1993), which is consistent with our findings in this study. Therefore, with due consideration to the large published literature showing negative correlation between procrastination and academic performance, we advanced the analysis one step further by determining a potential construct to mediate the relationship. The basic notion of this step is that procrastination ultimately create some type of academic conflicts (Grund and Fries 2018), then the students must at one stage deal with these resulting conflicts.

Two extreme conflict management approaches were considered, 'problem solving' and 'problem avoidance'. The former deals with the underpinning cases of conflict while the latter avoid the conflict hoping it will sort itself out. The data gathered in this work tends to support adoption 'problem avoidance' more, and therefore was selected to assess its role as a mediating construct. The analysis of the structural equation modelling indicate that 'problem avoiding', as a conflict management strategy, totally mediate the relationship between procrastination and academic performance. In terms of strength and direction of the mediation effect, 'problem avoidance' negatively impact the academic performance of the medical students resulting in lower performance. Therefore, although the procrastination seem not to have direct impact on academic performance, but with this mediation effect it negatively affect the academic performance, which is in agreement with vast majority of published data. One explanation for such mediation effect is that students find it easier to ignore the problem rather than confront it, which will ultimately impact their academic performance. The results of this study do answer the main two research questions stated earlier, i.e. procrastination seems to impact the academic performance but indirectly through total mediation of an intermediate construct, which in turns answers the second research question.

These results highlight the needs for taking procrastination seriously and must be managed effectively at early stages, otherwise academic performance will suffer. One approach for such management is to develop students' soft-skills, in particular in relation to their abilities to manage conflicts. Although such remedies will deal with the result rather than the underpinning causes, it can still be used to minimize the deterioration of academic performance which has much reaching consequences on the career and future development of the students.

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