

Self-Regulation as a Mediator in the Relationship between Self-Efficacy, Task Value and Active Procrastination

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Abstract

This study investigated the relationships between self-efficacy, task value, and active procrastination; and what role does self-regulation strategies play in these relationships. A total of 426 pre-service teachers, 223 males and 203 females, studying in colleges of education in North-Western Nigeria participated in the study. A set of self-report questionnaire was used to assess the participants' levels of procrastination, self-efficacy, task value beliefs, and self-regulation strategies. Structural equation modelling (SEM) was employed as statistical technique for data analysis of the study. The results, based on the hypothesized structural model, which overall goodness-of-fit indices indicate good model fit, revealed that self-efficacy and task value beliefs were not directly significant predictors of active procrastination. However, mediation analysis, which was conducted based on SEM or modern approach, showed that there was an evidence of indirect effect of the variables on active procrastination through self-regulation. Test of mediation by bootstrapping method established significant mediating role of self-regulation in the relationship between self-efficacy, task value and active procrastination. Theoretical and practical implications of the study, as well as recommendations for future research, have been presented.

Keywords: procrastination, active procrastination, self-regulated learning, mediation analysis, pre-service teachers

1. Introduction

Procrastination attracts researchers' attention in the past few decades. It is a behaviour characterized by postponing, delaying, or avoiding tasks that ought to be done to a later time. It involves voluntary delay in beginning or completing an intended course of action despite expecting to be worse off for the delay (Steel, 2007). Procrastination has been a common practice among college and university students. For example, estimates show that 80 to 95% of college students are found to be procrastinating, with about 50% of them procrastinate consistently and problematically (O'Brien, 2002; Onwuegbuzie, 2000; Steel, 2007). Research indicates that procrastination negatively affects progress as it limits the quality and quantity of student work (Rakes & Dunn, 2010). It results in a number of negative consequences on students' academic performance and subjective wellbeing (Cao, 2012; Klingsieck, Fries, Horz, & Hofer, 2012). As a result of its negative impact on students' academic achievement, procrastination has been extensively studied in academic realm.

Research indicates that procrastination is associated with low levels of academic self-efficacy and self-esteem (Hannok, 2011; Wolters, 2003), lower task value beliefs (Gropel & Steel, 2008), fear of failure and perfectionism (Brownlow & Reasinger, 2000), and lower life satisfaction (Klingsieck et al., 2012). Meta-analytic study (Steel, 2007) of procrastination showed that task aversiveness, task delay, self-efficacy, as well as impulsiveness were strong and consistent predictors of procrastination. Procrastination seems to be behaviour detrimental to the self that is aimed at avoiding or deterring achievement or success (Whatley, 2009). Furthermore, from self-regulated learning perspective (Pintrich, 2000; Zimmerman, 2008), procrastination is now seen as failure in self-regulation; or lack of self-regulated performance which involves cognitive, affective and behavioural components (Cao, 2012; Wolters, 2003). In this sense, Steel (2007) viewed procrastination as an embodiment of self-regulation failure. In spite of considerable efforts in describing its negative and harmful consequences, and curtailing this problem, the prevalence of procrastination appears to be increasing (Cao, 2012; Klassen et al., 2010).

From early 1990s, however, some researchers considered alternative approach to procrastination research by examining the beneficial and adaptive values associated with procrastination (Ferrari, 1993). In line with this alternative perspective, Chu and Choi (2005) believed that not all procrastination behaviours are harmful or are precursors of negative consequences. Specifically, they identified ‘positive’ form of procrastination – active procrastination – which is characteristically different from traditional negative and passive procrastination. Although procrastination has been studied in terms of its negative consequences, observed Choi and Moran (2009), Chu and Choi (2005) highlighted that active procrastination has positive implications for individuals in terms of their self-efficacy beliefs, stress coping, and performance; it is also positively associated with purposive use of time and perceived time control. The purpose of the present study, therefore, was to examine self-regulation, self-efficacy and task value as predictors of active procrastination; and whether self-regulation strategies play mediating role in these relationships.

1.1 Self-Efficacy

Self-efficacy is defined as “people’s judgements of their capability to organize and execute courses of action required in attaining designated types of performances” (Bandura, 1986, p.391). The concern is not on one’s skills but on the judgements of what one can do with whatever skills one possesses. Self-efficacy theory (Bandura, 1997) assumed that what we believe about ourselves strongly influences our task choice, level of effort, persistence, and resilience, and how we subsequently perform. Research indicated that self-efficacy is a strong and consistent predictor of procrastination (Hen & Goroshit, 2014; Steel, 2007; Van Eerde, 2003). The findings of Hannok (2011) showed a significant inverse relationship between self-efficacy beliefs and procrastination. From active procrastination perspective, Chu and Choi’s (2005) study established that active procrastinators, who see procrastination as a positive learning strategy, have higher levels of self-efficacy in comparison to passive procrastinators who see procrastination in a traditional negative way.

1.2 Task Value

Task value has been described as an incentive for engaging in different task (Eccles and Wigfield, 2002). That is, individuals’ beliefs about the value and importance of the task determine why they engage in such task. Pintrich, Smith, Garcia and McKeachie (1991) defined task value as the student’s evaluation of the how interesting, how important, and how useful the task is. It relates to asking oneself “*What do I think of this task?*” Furthermore, Pintrich, Roeser and De Groot (1994) offered that task value comprises of three general aspects: interest, utility, and importance. In academic domain, for instance, task interest connotes students’ personal interest or liking of the course material. Task utility refers to students’ perception of how useful the course material is to them. Task importance involves students’ beliefs about how significant the course content is for them and their future goals. Generally, individuals tended to delay the performance of tasks that are tedious and aversive in nature (Ferrari & Scher, 2000). For some students, according to Sokolowska (2009), procrastination may reflect lower task value characterized by decreased interest and limited priority placed on a particular task and its final outcome. Specifically, “procrastination is particularly susceptible to how aversive, especially boring, we find tasks” (Gropel & Steel, 2008, p.407). That is to say, the more unpleasant is a task, the more likely one will put it off.

1.3 Self-Regulation

Self-regulation refers to the way individuals make use of internal and external cues to determine when to initiate, when to maintain, and when to terminate their goal-directed behaviours. It is regarded as self-generated thoughts, feelings, and behaviours that are oriented toward the attainment of personal objectives (Zimmerman, 2008).

From academic realm, Zimmerman (2008) further offered that self-regulation involves the degree to which students are metacognitively, motivationally, and behaviourally active participants in their own learning process. This is further enunciated by Pintrich (2004) in which self-regulation is viewed as students' monitoring, controlling, and regulating their own cognitive activities and actual behaviour. From self-regulated learning perspective (Pintrich, 2000), self-regulatory activities serve as mediators between personal and contextual characteristics and actual achievement or performance. In other words, self-regulatory activities can mediate the relationships between individuals and the context, and their overall achievement. Wolters (2003) observed that deficits in self-regulatory behaviours, such as cognitive strategy use and monitoring important aspects of learning, result in an avoidance of tasks. Thus, students' motivation and the extent to which they engage in procrastination behaviour were also significantly related with their learning strategies (Pintrich, 2000; Zimmerman, 2008). Research shows that students who tend to procrastinate were found to be not able to effectively manage their learning (Ferrari, 2001) by being unable to select and use effective strategies that required effort and time to develop (Howell & Watson, 2007; Steel, 2007; Wolters, 2003). Hence, they experience low academic achievement (Onwuegbuzie, 2000).

1.4 Active Procrastination

With the introduction of a new idea into the area of procrastination research, Chu and Choi's (2005) research addresses the possibility that not all procrastination behaviours have negative consequences. They conceptualized and distinguished two different types of procrastination: active and passive procrastination. Active procrastination is a positive type of procrastination where procrastinators, in this sense, use their strong motivation under time pressure to make intentional decision to procrastinate, to be able to complete tasks before deadlines, and achieve satisfactory results (Chu & Moran, 2009). In contrast, passive procrastination is a type of procrastination in traditional way (i.e., negative procrastination); procrastinators in this category postpone or tasks that ought to be done until the last minute because of their inability to act in a timely manner with feelings of guilt and depression, and are more likely to fail to accomplish tasks. Chu and Choi (2005) observed that active procrastinators differ from passive procrastinators in cognitive, affective, and behavioural dimensions. While elaborating on active procrastination, Choi and Moran (2009) maintained that it is an observable behavioural characteristic that consists of an individual's affective preference for time pressure, cognitive decision to procrastinate, behavioural capacity to meet deadlines, and ability to achieve satisfactory results. Chu and Choi (2005) suggested that active procrastinators actually possess behaviours that correlate positively with self-efficacy and personal outcomes such as life satisfaction and higher grade point average (GPA). Research shows that passive and active procrastinators differ from each other in their degree of purposive use of time and perceived time control, self-efficacy, task value, test anxiety, GPA, and in level of self-regulation skills such as, elaboration, organization, time management, and effort regulation (Chu & Choi, 2005; Corkin, Yu, & Lindt, 2011; Shin & Goh, 2011). For instance, Seo's (2013) study shows that self-regulation relates to active procrastination.

1.5 The Present Study

The present study examines self-regulation and motivational beliefs variables of self-efficacy and task value in relation to active procrastination from self-regulated learning perspective. Specifically, this study aims to explore whether self-efficacy, task value and self-regulation can predict active procrastination. Based on the previous research findings, this study hypothesized that self-efficacy, task value, and self-regulation would be positively related to active procrastination. Again, since most of the models of self-regulated learning assumed that self-regulatory activities are mediators in the relationships between personal and contextual characteristics and actual achievement or performance (Pintrich, 2000), this study hypothesized that self-regulation would mediate the relationships between self-efficacy, task value and active procrastination.

2. Method

2.1 Participants

A total of 426 pre-service teachers, who were being prepared to become teachers at the lower and middle levels of the education system, from three colleges of education in North-Western Nigeria, participated in the study. The respondents included 223 males (52.3%) and 203 females (47.7%). Their ages ranged from 19 to 33 ($M=22.12$, $SD=2.67$).

2.2 Measures

The Motivated Strategies for Learning Questionnaire (MSLQ; Pintrich, Smith, Garcia, & McKeachie, 1991) was used to assess the participants' levels of self-efficacy, task value and self-regulation. It is a kind of self-report instrument designed to measure college students' motivational orientations and their use of different learning strategies for a college course (Pintrich et al., 1993). It is a widely used instrument in educational research (Rotgans & Schmidt, 2010) employed to measure a large number of motivational and self-regulated learning constructs. All items are scored on a 4-point Likert-type scale, from 1 ("Strongly Disagree") to 4 ("Strongly Agree"), which was a slight modification of the original scale. The 8-item self-efficacy scale, a component of the MSLQ, was used to assess participants' levels of self-efficacy. Example of the items includes "I am confident I can understand the most complex material presented in this course". The reported coefficient alpha reliability of the scale is .93; and for this sample is .81. Likewise, the 6-item task value scale of the MSLQ was used to measure the respondents' level of task value beliefs. Sample items for this scale include "I am very interested in the content area of this course." The coefficient alpha reliability of the scale is reported at .90, while that of this sample is .80. In addition, the self-regulation level of the participants for this study was measured by the use of the items from metacognitive, time management and effort regulation subscales of the MSLQ. Thus, the self-regulation scale used for this study consists of 22 items some of which include "If course materials are difficult to understand, I change the way I read the material" (Metacognitive); "I make sure I keep up with the weekly readings and assignments for my courses" (Time Management); and "Even when course materials are dull and uninteresting, I manage to keep working until I finish" (Effort Regulation). For this sample, the Cronbach's alpha reliability estimate for self-regulation scale is .83.

Choi and Moran's (2009) Active Procrastination Scale was used to assess the participants' level of active procrastination. It is a 16-item scale designed to measure four defining characteristics of active procrastinators. These four dimensions are outcome satisfaction (e.g., "I don't do well if I have to rush through a task" [Reversed]) preference for pressure (e.g., "It's really a pain for me to work under upcoming deadlines" [Reversed]); intentional decision to procrastinate (e.g., "I intentionally put off work to maximize my motivation"); ability to meet deadlines (e.g., "I often fail to accomplish goals that I set for myself" [Reversed]). All the items were scored on a 4-point Likert-type scale, from 1 ("Strongly Disagree") to 4 ("Strongly Agree"), which was a slight modification of the original scale. Composite measure of these four subscales was used to assess the overall level of the tendency of individuals towards active procrastination. The reported reliability coefficient of the scale is .80; and in this study the reliability was .77.

3. Results

This study was carried out to examine self-efficacy, task value, and self-regulation as predictors of active procrastination and looked into the mediating role of self-regulation in the relationship between the predictors and the outcome variables. In doing this, structural equation modelling (SEM) using Analysis of Moment Structure (AMOS) software was used. The assumption of normality was assessed by examining the values of skewness and kurtosis in the distribution of scores of the major variables (Field, 2009). Byrne (2010) suggests that values equal to or greater than 7 to be indicative of early departure from normality; and Kline (2005) offered that skewness value of less than 3 is acceptable. Therefore, the values of skewness and kurtosis for the variables of this study were checked and they are found to be within the acceptable range.

The means, standard deviations, and correlations of the variables involved in the study are shown in Table 1 below.

Table 1: Means, standard deviations, and correlations of the variables of the study (n = 426)

Variables	M	SD	1	2	3	4
1. Self-Efficacy	26.09	3.85	1.00			
2. Task Value	21.00	3.22	.48**	1.00		
3. Self-Regulation Strategies	73.33	11.18	.43**	.43**	1.00	
4. Active Procrastination	49.18	8.76	.14**	.13**	.42**	1.00

Note. ** $p < .01$.

Table 1 above shows zero-order correlations for scores on active procrastination, self-efficacy, task value, and self-regulation.

Most of the respondents for this study were at the moderate level of active procrastination (M = 49.18, SD = 8.76), high levels of self-efficacy (M = 26.09, SD = 3.85), task value (M = 21.00, SD = 3.22), and self-regulation (M = 73.33, SD = 11.18). The correlation analysis indicates that active procrastination scores were significantly associated with self-efficacy (r = .14), task value (r = .13), and self-regulation (r = .42). Furthermore, self-regulation was found to be significantly and positively related to both self-efficacy and task value (r = .43 and .43 respectively), and the correlation between task value and self-efficacy was significant and positive (r = .48).

To examine whether predictor variables (self-efficacy, task value, and self-regulation) predict active procrastination; and whether self-regulation mediates the relationships between self-efficacy, task value, and active procrastination, SEM was employed. The overall structural model provided a good model fit with fit indices in an acceptable range: $\chi^2 = 322.926$; DF= 164; $\chi^2/DF = 1.969$; GFI = .93; CFI = .96; NFI = .93; and RMSEA = .05. Table 2 below shows the unstandardized and standardized regression weights for the hypothesized structural paths.

Table 2: Unstandardized and Standardized Regression Weights in the Hypothesized Paths Model Predicting Active procrastination

Causal Path	B	SE B	Beta	CR	P
Active Procrastination <---- Self-Efficacy	.04	.05	.06	0.82	.436
Active Procrastination <---- Task Value	.02	.06	.02	0.30	.356
Active Procrastination <---- Self-Regulation	.20	.07	.44	2.88	.004

Notes: B = Unstandardized Regression Weight Estimate; S.E = Standard Error; Beta = Standardized Regression Weight; C.R = Critical Ratio; P = Significant Alpha

According to Table 2 above, the hypothesized relationship between self-efficacy and active procrastination was not supported ($\beta = .06$, C.R = 0.82, $p = .436$). This shows that there is no significant relationship between self-efficacy and active procrastination. Which means that self-efficacy is not significant predictor of active procrastination. Furthermore, the results indicate that the relationship between task value and active procrastination was found to be non-significant. This means that, according to the findings of this study, task value was not a significant predictor of active procrastination ($\beta = .02$, CR = 0.30, $p = .356$). However, the association between self-regulation and active procrastination has been supported by the hypothesized structural model. The results demonstrate that self-regulation significantly predicts active procrastination ($\beta = .44$, CR = 2.88, $p = .004$).

3.1 Mediation Analysis

One of the aims of this study was to determine the mediation effect of self-regulation strategies in the relationships between self-efficacy, task value, and active procrastination. In this regard, the present study sought to establish whether self-regulation mediates the relationships between self-efficacy, task value, and active procrastination. Thus, this study employed the use of modern or SEM approach (Preacher & Hayes, 2008) in the mediation analysis. This is against the commonly used Baron and Kenny’s (1986) causal steps approach. This is because “mediation analysis as practiced in the 21st century no longer imposes evidence of simple association between X and Y as a precondition” (Hayes, 2013, p.88). The idea behind modern approach to mediation analysis is that “there need not be a significant zero-order effect of X on Y, r_{xy} , to establish mediation” (Zhao, Lynch, & Chen, 2010, p.199). Hence, the mediation analysis for this study is based on the modern approach, as popularized by Preacher and Hayes (2004, 2008) and Hayes (2013).

Thus, the mediation analysis focused on the estimation and interpretation of the indirect effects as well as the inferential tests to determine the significance of the effect (Hayes, 2013).The standardized regression weights for the indirect effects are presented in Table 3 below.

Table 3. Standardized Regression Weights for a and b Paths

Structural Path	β a-path	β b-path
Self-Regulation Strategies <----- Self-Efficacy	.263*	
Self-Regulation Strategies <----- Task Value	.192*	
Active procrastination <----- Self-Regulation Strategies		.440*

Note: * $p < .05$

Based on Table 3, there is an indirect effect in the relationship between self-efficacy and active procrastination through self-regulation. The estimate, as shown by the standardized regression weight, reveals that there is significant effect self-efficacy on self-regulation ($\beta = .263, p < .05$); and that self-regulation, in turn, significantly affects active procrastination ($\beta = .370, p < .05$). Also, task value is shown to be indirectly related to active procrastination through self-regulation. The standardized regression weight shows that the causal paths between task value and self-regulation ($\beta = .192, p < .05$) and between self-regulation and active procrastination ($\beta = .440, p < .05$) were significant.

Therefore, based on the evidence of the presence of indirect relationships between the independent (self-efficacy and task value) and the dependent (active procrastination) variables through the mediator (self-regulation), as presented in Table 3 above, the significance of indirect effects of these relationships were to be tested. That is, to see whether “chance” factor can be discounted as a plausible explanation for the indirect effects obtained. To establish mediation, observed Zhao et al. (2010), all that matters is that the indirect effect is significant. Drawing conclusion about the significance of the indirect effects for this study, bootstrapping method was employed based on the 95% bias-corrected confidence interval (CI). The decision criteria follows that when zero (0) is outside the CI indirect effect is significant, otherwise the effect is insignificant (Byrne, 2010; Hayes, 2013). Results of the indirect effects test of significance are presented in Table 4 below.

Table 4: Results of the Standardized Indirect Effects Test on Active Procrastination through Self-Regulation Based on Bootstrap Bias-Corrected 95% Confidence Intervals

CONSTRUCTS	SIE	SE	BOOTSTRAP BC 95% CI	
			LB	UB
Self-Efficacy	.116	.013	.018	.342
Task Value	.084	.012	.010	.268

Note: SIE = Standardized Indirect Effect Estimate; SE = Standard Errors; LB = Lower Bound; UB = Upper Bound; BC = Bias Corrected; CI = Confidence Interval.

The bootstrap estimates, as presented in Table 4 above, are based on 5000 bootstrap samples. The interpretation of these results is that self-regulation did mediate the effects of self-efficacy and task value on active procrastination. That is to say that there is significant indirect relationship between self-efficacy and active procrastination through self-regulation. From the bootstrap analysis the mean indirect effect was found to be .093, and the 95% confidence interval lies between .041 and .165. This means that since zero is outside the CI, the indirect effect is significant. Therefore, the findings of this study indicated that self-efficacy is indirectly related to active procrastination through self-regulation. Also, the indirect relationship between task value and active procrastination through self-regulation was also tested. The results revealed that the indirect effect (.067) between the two variables was found to be significant based on the 95% bootstrap CI of .023 to .125. As the lower and upper limits of the CI did not include zero, there is 95% confidence that there is significant positive indirect effect of task value on active procrastination. Therefore, the findings of this study indicated that task value is indirectly related to active procrastination through self-regulation.

4. Discussion

This study investigates the predictive ability of self-efficacy, task value, and self-regulation on active procrastination among pre-service teachers in colleges of education, and tried to look into the mediating role of self-regulation in these relationships. Based on the structural model, the analysis of the direct relationships between the predictor variables and the outcome variable, as presented in Table 2, shows that self-efficacy was not a significant predictor of active procrastination. These findings contradict Chu and Choi's (2005) study which found significant positive relationship between self-efficacy and active procrastination. In addition, Cao (2012) found that active procrastination positively predicts educational psychology self-efficacy. However, when compared with passive or traditional procrastinators, Cao found no significant difference in self-efficacy beliefs with active procrastinators. Furthermore, Gendron's (2011) study found no significant relationship between self-efficacy for learning and performance and active procrastination, which provide no support for the hypothesis that active procrastination would be positively related to self-efficacy beliefs. These are in line with the findings of this study. Furthermore, the results of this study indicate that the relationship between task value and active procrastination was found to be non-significant.

This result is in harmony with the findings of Cao (2012) study that task value was not found to be a significant predictor of active procrastination. While making comparison, active procrastinators reported a significantly lower level of task value than non-procrastinators; furthermore, Cao (2012) found no significant difference in task value between active and passive procrastinators. Contrary to the findings (Anderson, 2001; Sokolowska, 2009; Steel, 2007) that task value is a predictor of academic procrastination, active procrastination was not found to be related to task value. Thus, the results of this study did not support the hypothesis that task value is a good predictor of active procrastination.

However, when self-regulation was regressed against the outcome variable, the relationship was found to be significant. The findings demonstrate that self-regulation was found to be a significant predictor of active procrastination. Self-regulation alone explained 17% of the variance in the outcome variable. This is in line with the observation of many studies that self-regulation is an important variable associated with academic procrastination (Klassen, Krawchuk, & Rajani, 2008). Steel (2007) further described procrastination as a “quintessential self-regulation failure” (p.65). Again, the findings were in line with the claim that deficits in self-regulatory behaviours, such as cognitive strategy use and monitoring important aspects of learning, result in an avoidance of tasks (Wolters, 2003). Thus, students’ motivation and the extent to which they engage in procrastination behaviour were also significantly related with their learning strategies (Pintrich, 2000; Zimmerman, 2008). However, Gendron’s (2011) study did not find significant relationship between the global score of active procrastination and measures of self-regulated learning.

In addition, based on the self-regulated learning viewpoint (Pintrich, 2000; Zimmerman, 2008), the hypothesized indirect relationships of the independent and dependent variables through self-regulation were tested. The result showed that self-regulation, as mediator, plays a significant role in the hypothesized indirect relationships between self-efficacy, task value and active procrastination. This also supported by the fact that the two predictor variables explained 42% of the variance in self-regulation, which in turn, explained 15% of the variance in active procrastination. As such, the results of this study supported the claim that procrastination is essentially a failure in self-regulation (Steel, 2007).

5. Conclusion and Implications

In accordance with the findings of the present study, the conclusion is that procrastination is essentially a failure in self-regulation (Steel, 2007); and that the results supported the theory of self-regulated learning which assumed that “self-regulatory activities are mediators between personal and contextual characteristics and actual achievement or performance” (Pintrich, 2000, p. 453). As the findings established the mediating effect of self-regulation in the relationship between the independent variables and active procrastination, this underscores the importance of self-regulation in procrastination research. One significant theoretical implication of this study is the shift in the procrastination research focus by viewing procrastination as a failure in self-regulation which involves cognitive, affective and behavioural components. In practice, the important role played by self-regulation in relation to procrastination, as demonstrated by the findings of this study, would be of great help to practitioners especially in the area of education. Thus, ability to self-regulate plays an important role in the dynamics of procrastination. Self-regulation may be a key to understanding procrastination. In this regard, active procrastination, contrary to the Chu and Choi’s (2005) claim that it is a ‘positive’ form of procrastination, may be a form of self-regulation strategy employed by individuals to attain desirable outcomes. Therefore, researchers’ efforts, in future research, should be geared towards investigating procrastination in relation to self-regulation strategies for better understanding of the phenomenon and its dynamics.

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