Towards an Integrative Model of Achievement Outcomes in Research Writing: A Predictive Analysis of Personal, Behavioural, and Environmental Factors.

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ABSTRACT

The study examined the influence of self-efficacy (PF), student engagement (BF), and mentorship (EF) on student’s achievement outcome in research writing. The participants in the study were graduating students and were composed of a sample size of N=257. Convenience and snowball sampling techniques were adopted in the sample selection from within the university. The study employed an explanatory research design and used a one-way and factorial ANOVA as the statistical techniques for data analysis. All one-way ANOVA to determine the direct effects of Self-efficacy F(1, 255)= 6.46, p<.011, Student Engagement effect F(1, 255)=4.40, p<.036 and Mentoring F(1, 255)=17.38, p<.000 on Student’s achievement outcome in research writing were statistically significant, including the factorial ANOVA to determine interaction effect of self-efficacy × student engagement × mentoring F(1,249)=9.56, p<.002. The interaction result suggests that students with high self-efficacy, high engagement and positive mentoring are likely to have high levels of achievement outcome in research writing. In contrast, a combination of low self-efficacy, negative mentoring and low student engagement is likely to lead to a very low achievement outcome in research writing.

Keywords: Self-efficacy, Student Engagement, Mentoring and Student’s Achievement Outcome.

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INTRODUCTION

Research writing is an essential part of an undergraduate degree because, in most universities across the world, it is mandatory for students to pass their final research to be eligible for an undergraduate degree. A task which necessitates diverse skills and actions, such as coming up with a topic, writing a draft proposal which is all subject to approval by the faculty, and finishing the research before set cut-off date. This explains how important a successful completion, or a favourable outcome of final research is to an undergraduate. To conduct research or engage in research writing is a daunting task, but it comes with many benefits, whether for its sake or to satisfy an academic requirement.

According to literature, maintaining undergraduate research programs in universities is beneficial to students, the school, and society at large (John & Alan, 2008). That unique learning and developmental advantages could be realized by taking part in undergraduate research, such as gaining scholarly experiences and global learning, etc. (Kuh, 2008). This suggests that a good achievement outcome in research in writing is crucial to a student’s academic pursuit.

Hence, over the years, educators, school administrators, and researchers have been concerned with identifying and exploring factors that affect student achievement outcomes. Particularly in the fields of Educational Psychology, this has been a research topic of interest, thus different models and theories have been used to explain student achievement outcomes. One such known theory is the Social Cognitive Theory-SCT by Bandura which tends to explain achievement outcomes in view of the influence of personal characteristics alongside environment and behaviour on the learning process.

While previous studies conducted within the social cognitive theoretical framework allows for the consideration of multiple variables vis-à-vis academic performance (Bandura et al., 1996), these studies tend to exclude personal, behavioural and environmental factors at the student’s own level that contributes to their achievement. This has resulted in gaps in the literature, thus there is the need to expand the scope of variables considered to be contributing factors to student achievement outcomes, chiefly in the context of research writing.

Thus, the focal aim of this study was to examine the influence of self-efficacy (personal factor), student engagement (behavioural factor), and mentoring (social/environmental factor) on student achievement outcome in research writing. The study equally aims to examine if there could be an interaction effect among the variables under investigation on student achievement outcomes in research writing.

With regard to significant benefits, this study will contribute to the achievement outcome literature by expanding the scope of factors which may influence achievement outcomes in the context of research writing, and it could be of potential benefit to students and administrators, and could serve as a basis for instructional design and curriculum development for research and related courses.

Furthermore, an awareness of the personal, behavioural, and environmental factors that influence student achievement outcome could also inform mentors/supervisors and serve as a basis for well-guided mentoring and desired optimal success in research writing.

LITERATURE REVIEW

Self-efficacy (Personal Factor-PF)

Self-efficacy is defined as a person’s confidence to manage and carry out actions to produce desired results (Bandura, 1995; 1997). Within the SCT framework, self-efficacy is described as a motivational orientation that optimizes planned actions, encourages long-standing views, promote self-regulation and permits self-correcting at any time (Bandura, 2001). It is thus, one’s view about their capability to organize and carry out actions to accomplish desired goals and functions.

Unrau & Beck (2005) posited that one of the key variables affecting research writing is research self-efficacy which is the self-belief in one’s ability to carry out research. In a qualitative study, Forester et al. (2004) conceptualized research self-efficacy as an individual’s belief on his/her ability to conduct research successfully and that personal factor such as the student’s own expectations affect this belief. Hence, they submitted that students with high
expectations/beliefs in their abilities are more probable to carry out research than those with low expectations/beliefs in their abilities, who most times refuse to undertake research.

Many other studies have also asserted that self-efficacy is a dependable predictor of motivation and attainment, one which changes not whether with time, place or difference in society (Duckworth et al., 2007; Farsides & Woodfield, 2003). According to Wood & Bandura (1989), people of strong perceived efficacy show superior cognitive ingenuity, tactical flexibility, and efficiency in managing their environment, they brace up for challenges and envision likely success paths that present positive channel for performance. While those who are skeptical of their efficacy envision likely paths for disappointments which undercut performance, they get fixated on things that can go wrong.

In other studies is this growing assertion that academic accomplishments or missteps may be linked to high or low levels of self-efficacy which can likely account for performance outcome of students in universities (Abouserie, 1995). Miller & Brickman (2004) in their study also asserted that strong academic attainment may be related to a high conviction in one’s abilities and that this serves as motivation for learners to be more accountable for their accomplishment in their academic tasks. In the same vein, Frey & Determan (2004) in their study maintains that those students who have higher capabilities, exhibit superior performance and get higher assessments; such students clearly hold high self-efficacy and less anxiety.

As revealed by literature, self-efficacy beliefs set the ground for consideration of many life options, and also control their execution. With it, people make the choice of which goals to pursue, how much effort to devote and how long to hold on when challenges strike (Bandura, 1991; Locke & Latham, 1990). When faced with difficulties, people who are skeptical of their abilities easily give up and settle for the less, while people with a strong belief in their abilities intensify their efforts and work out ways to curb challenges. Literature further reveals that people with high efficacy set goals for themselves and expects their efforts to yield positive results (Bandura, 1991; Locke & Latham, 1990).

**Student Engagement (Behavioural Factor-BF)**

Student engagement is the level at which students are engaged in learning in the formal education process. It also refers to time, effort, and energy they commit to learning tasks, such as school-related activities and coursework. Literature has shown that student engagement is an important lever for increasing learner outcomes, that being engaged adds up to the dexterity and inherent qualities that are necessary to live a prolific and gratifying life.

Amy and colleagues (2012) reported that engagement doesn’t only compel learning but also determines school success (Harper & Quaye, 2009). High level of student engagement involves a blend of unwavering enthusiasm and continuous effort in academic activities (Appleton et al., 2006), and according to the Participation-Identification Model of student engagement, taking part in school and class activities raises students’ attainment, and that their attainment in turn influences their feelings of identification with the school (Finn, 1989).

The class and campus engagement components of the Participation-Identification Model examined by Gunuc and Kuzu (2014) explains further that for a student’s learning to be effective and be productive, they should hold high levels of campus and class engagement. In many studies conducted in that regard shows that campus/school climate is likely to influence student attainment and conduct (Gunuc, 2013; Finn, 1993; Finn & Voelkl, 1993).

Student engagement is proven to be a pertinent factor in elucidating variations in a student’s attainments at both the school and classroom level (Covington, 2002), thus in most studies, it is asserted to be likely determinant of performance outcome in many contexts (Walker, Green, & Mansell, 2006).

While many studies have looked at the effect of student engagement on other response variables, none has investigated it in light of its effect on student achievement outcomes in view of research writing.

**Mentoring (Environmental Factor-EF)**

Mentoring is when a more knowledgeable person provides direction, information or advising to a less knowledgeable person (Campbell & Campbell, 1997). It is viewed as a broadened connection between a teacher/mentor and a student who is differently called a mentee, protégé, trainee, or assistant over a period (Chan, 2000). Ideally, for mentors to produce desired results for their mentees, they should communicate openly, clearly, effectively and give honest feedback about mentees’ works.

Mentoring thus involves open communication and effective feedback (Rose, 2003). For Powell (2005), mentoring is about building links that help mentees succeed. An effective mentor is conscious of their mentee’s concerns (Cramer
& Prentice-Dunn, 2007). Berger (1992) and Jacobi (1991) further affirmed that compassionate mentors take steps in offering opportunities for the development of the mentee’s identity and self-awareness, resulting in greater self-confidence, and higher career prospects (as cited in Bruce, 1995).

According to literature, one important lever that can be used to promote better learning outcome is positive mentoring relationships that can change the path of young people’s lives. Studies have revealed that 52% of students that were mentored are more probable to remain in school, accomplish homework/class assignments than students who were not mentored. David and colleagues (2011) after reviewing 70 existing mentoring programs by using meta-analysis reported that there are multiple benefits for students, that mentorship sets the stage for high achievement across behavioural, social, emotional domains at once.

Literature also reveals that not all mentoring relationships produce the same outcomes for students. While some produce negative experiences or effects, others produce positive effects or outcomes. The distinction between positive and negative mentoring was first proposed by Kram (1985), who dichotomized the primary functions of mentors into two categories. Positive mentoring entails tapping into positive view towards self, career and the future and learning (Caprara et al., 2010; Seligman et al., 2009). It also entails mentors orienting mentees to see the positive aspects of life as a remedy to misery, increase creative thinking, inoculate professional satisfaction, and improve learning.

Furthermore, it entails, mentors, encouraging mentees to revitalize their thoughts positively, and continue with these new thought patterns and actions by one’s self (Seligman et al., 2009). Being positive also refers to the possibility of strong learning relationships (Brewer, 2016). It is also about the honesty in the relationship that the mentee experiences, which is asserted to give an assurance to the mentee that the mentor accepts them and their situation.

On the contrary, negative mentoring is defined by the presence of problems, conflicts, or even misdemeanour on the part of the mentor. In a content analysis of mentors’ and mentees’ experiences, Eby and colleagues (2000) listed some examples of negative mentoring behaviours as follows: mentee abandonment, excessive concern with mentees’ own career advancement, insensitivity to mentee’s needs, lack of involvement of mentee in vital events and meetings, guidance not offered as ought to, but only to take credit for mentee’s success.

Negative mentoring also rears itself in the form of lack of mentor’s technical and interpersonal incompetency, all of which deter effective mentoring. According to them, one or more of the above may be present in negative mentoring relationships, and they are asserted to adversely affect achievement outcomes (Eby et al., 2000), while positive and successful mentoring is very essential for the career success of both the mentor and mentee.

Despite the extensive literature on mentoring and its importance, most of which were done in the business sector. Less is done to explore its importance in school settings and its likely relationship to other predictor variables such as self-efficacy, and student engagement.

**Achievement Outcome in Research Writing**

The concept of achievement outcome is extensive and covers a variety of educational outcomes. Thus, its definition also depends on the parameters used for its measurement. The term “outcome” could refer to cognitive or emotional variables, if measured as cognitive variables, learning attainment is considered an important outcome, and if it measured as an emotional variable, satisfaction with a course is an imperative outcome, given that it affects students' judgment to carry on with a course or withdraw (Levy, 2007).

Majority of student outcomes are measured as cognitive variables such as test scores, grades, etc. In this study, achievement outcome is considered to be an emotional variable. Hence, satisfaction is considered imperative research outcome. Achievement outcome in this research is defined with regard to accomplishments students make in research writings or performance outcomes that indicate the extent to which they have accomplished the task of research writing as undergraduates.

**Synthesis**

Though previous studies have widely examined factors influencing student performance outcomes, most of those studies were limited in scope, and they focused mainly on prior writing achievement, social economic factors, research writing apprehension and locus of control. While these studies have examined a wide range of variables, they tend to neglect other imperative factors on the part of the student that may also contribute to their performance outcomes. It was this gap in the literature that informed the need for more inquiry to expand the scope of factors considered to be determinants of student achievement outcomes, particularly in the context of research writing.
Statement of the Problem/Hypothesis

Problem 1: Does self-efficacy influence student achievement outcome in research writing?

Hypothesis: Self-efficacy will significantly affect student achievement outcome in research writing.

According to Miller & Brickman (2004), strong academic attainment may be related to a high conviction, and that it serves as motivation to be more accountable for their accomplishment in their academic tasks.

Problem 2: Does student engagement in academic tasks influence a student’s achievement outcome in research writing?

Hypothesis: Student engagement will influence achievement outcome in research writing.

According to the Participation-Identification Model of student engagement, participation in school and class activities raises students’ attainments (Finn 1989).

Problem 3: Does mentoring affect a student’s achievement outcomes in research writing?

Hypothesis: Mentorship will significantly affect a student’s achievement outcome in research writing.

According to Seligman and colleague’s (2009), a positive mentoring relationship creates feelings of self-awareness and self-confidence which in turn influences student performance.

Problem 4: Would there be an interaction effect of self-efficacy; student engagement and mentoring on achievement outcome in research writing?

Hypothesis: There will be a significant interaction effect of self-efficacy, student engagement and mentoring on student achievement outcome in research writing.

According to the assumptions of the SCT by Bandura (1977), human functioning is moulded by the interaction of personal, behavioural, and social/environmental factors.

Theoretical Framework

The conceptual framework used in this study is anchored on Bandura’s (1977) Social Cognitive Theory which suggests that human functioning is shaped by the dynamic interaction among personal factors, environmental influences, and behavioural patterns. That these three factors operate within a system of triad reciprocity (Bandura, 1986). The triad reciprocity implies that strategies for improving human functioning can address personal factors, behavioural competencies, or social/environmental conditions, and thus, there is no permanent pattern for reciprocal interaction. Rather, the comparative influence of the factors depends on the activities, situational circumstances, and sociostructurally limitations and chances.

This means that in academic settings and with regard to performance outcome, there is no permanent pattern of interaction of personal factors, behavioural patterns, and environmental influences, but rather depends on the academic task and situational influences. The theory further posited that the strength of one’s self-efficacy beliefs or one’s perceived ability to accomplish a given task will influence whether a person initiates and persists in coping behaviours or not. Applied to the academic domain, self-efficacy has been theorized as playing an influential mediation role in academic attainment (Bandura, 1997).

Students’ self-efficacy beliefs, both with regard to their research ability and their ability to regulate their research activities, would be expected to influence their achievement outcomes in research writing. The manner in which students engage with the task of research writing is also an indication of their motivation. According to Winne and Hadwin (2008), students exercise conscious control of their learning which in turn determines their level of engagement and perseverance on a given task.

The environmental factor of the SCT is concerned with the interactive relations between personal characteristics, behavioural factors, and environmental influences. Our beliefs, emotional inclinations, and cognitive abilities are built up and altered by social influences that convey information and turn on emotional feedback via modelling and tutoring (Bandura, 1986).

In applying the assumptions of the SCT to this present study, student’s achievement outcomes in research writing would supposedly operate within the boundaries of personal, behavioural, and environmental factors. Hence, self-efficacy (PF), student engagement (BF) and mentorship (EF) will be expected to interact with each other to affect...
student’s achievement outcomes in research writing. In the figure below is a graphical representation of the conceptual framework.

Conceptual Framework

![Diagram of Conceptual Framework]

**Figure 1:** Self-efficacy (PF), Student engagement (BF), and Mentoring (EF) as predictors of Student’s Achievement Outcome in Research Writing.

**METHOD**

**Research Design**

The study used an explanatory research design because explanatory research design attempts to connect different ideas and give an explanation to their connection in detail. Explanatory research design fits this study because the study intended to provide a detailed explanation of the relationship among self-efficacy (PF), student engagement (BF) and mentoring (EF) at the student’s own level that affects their achievement outcomes in research writing.

**Participants and Sampling**

The participants of this study consisted of 257 students that were conveniently selected from among students who had taken their research writing courses. This sampling technique fits this study because according to Fink (2003), a convenience sampling technique enables researchers to choose from people that are ready and available to partake.

**Materials**

1. **Self-efficacy.** This was measured by Research Self-Efficacy Scale (RSS) originally developed by Şener et al. (2011) but modified by the researcher to fit the purpose of the research. The scale measures research-related self-efficacies of university students. Its alpha coefficient is .87. Sample questions: (a) I can find an appropriate title to my research, (b) I can write an abstract to my research with ease.

2. **Student Engagement.** This was measured using the student engagement survey adapted from the Australian Survey of Student Engagement (AUSSE). A 4-point Likert scale of (1) Never (2) Sometimes (3) Often (4) Very often. The scale measures 6 domains: academic challenge, active learning, and collaborative learning, student-faculty interaction, enriching educational experiences and supportive campus environment. Its Cronbach’s alphas are .82 above for all domains (NSSE, 2017). Sample questions: How often have you done each of the following; (1) Sought advice from academic staff (2) Worked hard to master difficult content.

3. **Mentoring.** A Mentor-Mentee Research Relations Questionnaire was used, 20 items, 4 points Likert scale of (1) for strongly agree (2) for agree (3) for strongly disagree, and (4) for disagree. The scale was developed by the researcher and was based on Kram (1985) categorization of mentoring relationships. The questionnaire covered both
negative and positive mentee experiences in research writing with a Cronbach alpha of .87. Sample questions: (a) I got the needed research guidance from my mentor (b) I did not receive proper research guidance.

4. Student Achievement Outcome in Research Writing. Student Achievement Outcome Survey was used, a 10 item, 4-points Likert scale of (1) for strongly agree, (2) for agree (3) for strongly disagree (4) for disagree. Its Cronbach’s alpha is .92. Sample questions: (1) I was satisfied with my overall research experience (2) I reviewed my research several times before it was approved.

Procedure

The participants were conveniently selected and then contacted to seek their consent to take part in the study. Those who consented to partake had the questionnaires administered to them to fill out at their own time for at most half an hour. Completed questionnaires were retrieved, and data coded. Scores obtained from the participants on each of the three questionnaires were then matched against the achievement outcome scores that were obtained through a student’s achievement outcome survey.

Data Analysis

The study employed a one-way and a 2×2×2 factorial ANOVA to analyse the data, while one-way ANOVA is a technique used to compare the means of one categorical input variable “X” to only one numerical response variables “Y”. Factorial ANOVA, on the other hand, contrasts the means of two or more factors.

In this study, hypothesis 1-3 consists of single categorical variables: self-efficacy (low/high), student’s engagement (low/high) and mentoring (positive/negative), and a single numerical response variable (student achievement outcome in research writing).

Hypothesis 4 consisted of multiple categorical variables and one numerical variable, and the aim of the study was to compare the means of the variables and test their interaction effect on the dependent variable student achievement outcome in research writing. Thus, one-way and factorial ANOVA was chosen as the statistical tools for analysis for the data of the study.

RESULTS

Problem 1: Does self-efficacy influence student achievement outcomes in research writing?

Hypothesis: Self-efficacy will significantly affect student achievement outcomes in research writing.

Table 1

One-way Analysis of Variance of Achievement Outcome by Self-efficacy.

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>DF</th>
<th>MS</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>363.717</td>
<td>1</td>
<td>363.717</td>
<td>13771.26</td>
<td>.000</td>
</tr>
<tr>
<td>Self-Efficacy</td>
<td>0.170</td>
<td>1</td>
<td>0.170</td>
<td>6.46</td>
<td>.011*</td>
</tr>
<tr>
<td>Error</td>
<td>6.734</td>
<td>255</td>
<td>0.026</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: *p<.05.

A one-way ANOVA was computed to examine the influence of self-efficacy on student achievement outcome in research writing. The result showed a statistically significant: F (1, 255) = 6.46, p<.011, such that there was a significant difference between high (M=1.25, SD= 0.24), and low (M=1.20, SD=0.07) self-efficacy.

Given the 0.05% variation in the means between high and low self-efficacy, the result answered the question posed by problem 1 which sought to determine if a students’ self-efficacy do influence their achievement outcomes in
research writing. The result suggests students with strong academic abilities or high self-efficacy are more likely to accomplish their research task and be successful in their research writing than those with weak or low self-efficacy.

**Problem 2:** Does student engagement in academic tasks influence their achievement outcomes in research writing?

Hypothesis: Student engagement will influence achievement outcomes in research writing.

**Table 2**

*One-way Analysis of Variance of Achievement Outcome by Student Engagement.*

<table>
<thead>
<tr>
<th>Source</th>
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<th>MS</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>385.314</td>
<td>1</td>
<td>385.314</td>
<td>14474.01</td>
<td>.000</td>
</tr>
<tr>
<td>Student Engagement</td>
<td>0.117</td>
<td>1</td>
<td>0.117</td>
<td>4.40</td>
<td>.036*</td>
</tr>
<tr>
<td>Error</td>
<td>6.788</td>
<td>255</td>
<td>0.026</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: *p<.05.

A one-way ANOVA was computed to determine the effect of engagement on student’s achievement outcome in research writing. The result yielded a statistically significant effect $F(1, 255)=4.40, p<.036$, and showed a significant difference in effect in the individual levels of engagement; high ($M=1.24, SD= 0.21$), and low ($M=1.20, SD=0.08$).

This result answered the question raised by problem 2 which sought to determine if a students’ engagement does influence their achievement outcomes in research writing. Given the descriptive cell statistics that showed a variance of 0.04% in the means between high and low engagement, with high engagement shown to have a stronger effect on student’s achievement outcome in research writing, thus suggesting that the more invested students are or the more effort they put into their research task, the more likely they will succeed in their research writing.

**Problem 3:** Does mentoring affect student achievement outcome in research writing?

Hypothesis: Mentoring will significantly affect student achievement outcome in research writing.

**Table 3**

*One-way Analysis of Variance of Achievement Outcome by Mentoring.*

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>DF</th>
<th>MS</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>321.634</td>
<td>1</td>
<td>321.634</td>
<td>12686.38</td>
<td>.000</td>
</tr>
<tr>
<td>Mentoring</td>
<td>0.440</td>
<td>1</td>
<td>0.440</td>
<td>17.38</td>
<td>.000*</td>
</tr>
<tr>
<td>Error</td>
<td>6.464</td>
<td>255</td>
<td>0.025</td>
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</tr>
</tbody>
</table>

Note: *p<.05.

A one-way ANOVA computation revealed that the effect of mentoring on student achievement outcome in research writing was significant, $F(1, 255)=17.38, p<.000$, such that positive mentoring showed ($M=1.29, SD=0.30$), and negative mentoring showed ($M=1.19, SD=0.00$).

The difference in the means between positive and negative mentoring on student’s achievement outcome was 0.1% with positive mentoring shown to have more influence. This suggests that mentoring relationships do have an effect.
on the research outcomes of students. This indicates that the better the guidance students get from research supervisors or mentors the greater the chances of success in their research writing.

**Problem 4:** Would there be an interaction effect of self-efficacy, student engagement and mentoring on achievement outcome in research writing?

Hypothesis: There will be a significant interaction effect of self-efficacy, student engagement and mentoring on student achievement outcome in research writing.

**Table 4**

*Factorial Analysis of Variance of Achievement Outcome by Self-Efficacy × Student Engagement × Mentoring.*

<table>
<thead>
<tr>
<th>Source</th>
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<tbody>
<tr>
<td>Intercept</td>
<td>265.128</td>
<td>1</td>
<td>265.128</td>
<td>13371.59</td>
<td>.000</td>
</tr>
<tr>
<td>Self-Efficacy</td>
<td>0.269</td>
<td>1</td>
<td>0.269</td>
<td>13.61</td>
<td>.000*</td>
</tr>
<tr>
<td>Student Engagement</td>
<td>0.633</td>
<td>1</td>
<td>0.633</td>
<td>31.97</td>
<td>.000*</td>
</tr>
<tr>
<td>Mentoring</td>
<td>0.762</td>
<td>1</td>
<td>0.762</td>
<td>38.43</td>
<td>.000*</td>
</tr>
<tr>
<td>Self-Efficacy × Student Engagement</td>
<td>0.178</td>
<td>1</td>
<td>0.178</td>
<td>8.99</td>
<td>.002*</td>
</tr>
<tr>
<td>Self-Efficacy × Mentoring</td>
<td>0.283</td>
<td>1</td>
<td>0.283</td>
<td>14.32</td>
<td>.000*</td>
</tr>
<tr>
<td>Student Engagement × Mentoring</td>
<td>0.655</td>
<td>1</td>
<td>0.655</td>
<td>33.05</td>
<td>.000*</td>
</tr>
<tr>
<td>Self-Efficacy × Student Engagement × Mentoring</td>
<td>0.189</td>
<td>1</td>
<td>0.189</td>
<td>9.57</td>
<td>.002*</td>
</tr>
<tr>
<td>Error</td>
<td>4.937</td>
<td>249</td>
<td>0.019</td>
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<td></td>
</tr>
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</table>

Note: *p<.05.

A factorial ANOVA was computed to determine the interaction effect of self-efficacy (high, low) student engagement (high, low), and mentoring (positive and negative) on achievement outcome in research writing. The result showed a significant interaction effect $F(1.249) = 9.56, p<.002$.

A descriptive cell statistic (refer to Table 5, page 21) further showed an interaction of the respective factors, the variance in their means and standard deviations as follows:

- High self-efficacy, high student engagement, and positive mentoring ($M=1.60$, $SD=0.52$)
- Low self-efficacy, high student engagement, and positive mentoring ($M=1.31$, $SD=0.33$)
- High self-efficacy, low student engagement, and positive mentoring ($M=1.22$, $SD=0.17$)
- Low self-efficacy, low student engagement, and negative mentoring ($M=1.20$, $SD=0.00$)

The result answered the question raised in problem 4 as it indicated that self-efficacy, student engagement, and mentoring interact at different levels to influence student’s achievement outcome in research writing, with high self-efficacy, positive mentoring, and high engagement shown to have the strongest effect on student achievement outcome in research writing. This implies those students who have a triad combination of high efficacious beliefs, invested quality time and effort in their research writing task, and received proper research guidance from a research mentor are more likely to have higher achievement outcomes than those with other levels of combinations of self-efficacy, student engagement and mentoring. Below is a graphical presentation of the interaction and descriptive cell statistics of the study for further analysis.
Figure 2: Graphical presentation showing the interaction of self-efficacy, student engagement, and mentoring on student achievement outcome in research writing.

The graph above shows a 3-way interaction plot of self-efficacy (high/low), student engagement (high/low), and mentoring (positive/negative) on student’s achievement outcome in research writing. Indicating that high self-efficacy, high student engagement, and positive mentoring interact to produce the highest achievement outcome at a confidence interval of 1.61%, while low self-efficacy, high student engagement, and positive mentoring interact to produce a moderately high achievement outcome at a confidence interval of 1.31%.

The graph also shows a combination of high self-efficacy, low student engagement, and positive mentoring interacting to produce a low achievement outcome at a confidence interval of 1.21%, and another combination of low self-efficacy, low engagement and negative mentoring interacting to produce the lowest achievement outcome at a confidence interval of 1.20%.

Table 5

<table>
<thead>
<tr>
<th>Source</th>
<th>Factor Levels</th>
<th>Achievement Outcome Mean</th>
<th>Achievement Outcome Std Dev</th>
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<tbody>
<tr>
<td>Self-efficacy</td>
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<td>1.205</td>
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</tr>
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<td>0.246</td>
</tr>
<tr>
<td>Student Engagement</td>
<td>Low</td>
<td>1.205</td>
<td>0.087</td>
</tr>
<tr>
<td>Student Engagement</td>
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<td>0.219</td>
</tr>
<tr>
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<td>Negative</td>
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<td>0.007</td>
</tr>
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<td>1.291</td>
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<tr>
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<td>Low, Negative, Low</td>
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</table>
DISCUSSION

Achievement outcomes of students are said to be linked to different variables, these include socioeconomic status, demographic factors, learning climate, research interest, etc. The findings of this study have expanded the scope of variables that influence student achievement outcome by adding more personal, behavioural and environmental factors.

Self-efficacy

Problem 1 which sought to determine the influence of self-efficacy on student achievement outcomes in research writing showed a significant effect: \( F(1, 255) = 6.46, p < .01 \), and a variance in the means of the levels of self-efficacy: high \((M=1.25, SD= 0.24)\), and low \((M=1.20, SD=0.07)\). This suggests that student’s beliefs in their personal capabilities, whether weak or strong, high or low does play a significant role in determining their performance outcomes, especially in research writing.

The variance in effect between high and low self-efficacy further indicates that students with high self-efficacy are likely to have high achievement outcomes in research writing compared to students with low self-efficacy. Reasons are that; people with strong perceived efficacy show superior cognitive ingenuity, tactical suppleness, and efficiency in managing their environment (Wood & Bandura, 1989).

In line with self-efficacy postulates, students with high self-efficacy braces up for challenges and envision likely success paths that present positive channels for performance, while people who are skeptical of their efficacy envision likely paths for disappointments which undercut performance because they are fixated on things that can go wrong.

The finding in problem one is in line with Bandura (1977) assertion that high self-efficacy is a principal motivator of achievement outcomes. It is also in accord with Miller & Brickman’s (2004) assertions that strong academic attainment may be related to a high conviction in one’s self to be more accountable for one’s accomplishments of academic tasks.

Student Engagement

The effect of student engagement on achievement outcome in research writing \( F(1, 255)=4.40, p < .036 \) and the significant difference in each level of engagement; high \((M=1.24, SD= 0.21)\), and low \((M=1.20, SD=0.08)\) thus suggest that high engagement has a stronger effect on student’s achievement outcomes in research writing, which means that the level of commitment or degree of engagement in academic tasks counts in determining student’ performance outcomes.

The more invested students are or the more effort they put into their research task, the more likely they will succeed in their research writing. The finding agrees with the Participation-Identification Model of student engagement which holds that participation in school and class activities increases students’ attainment (Finn 1989). It is also in line with Gunuc and Kuzu’s (2014) assertion that in order for students to go through effective learning and be productive, they should have high levels of campus and class engagement.

Mentoring

The ANOVA computation for problem 3 which sought to determine the influence of mentoring on student achievement outcome in research writing yielded a statistically significant effect: \( F(1, 255)=17.38, p<.000 \), such that positive mentoring \((M=1.29, SD=0.30)\), and negative mentoring \((M=1.19, SD=0.00)\) showed varying effects on achievement outcomes in research writing.

This suggests that positive mentoring relationships are strong antecedents of student achievement outcomes in research writing. That is, the better the guidance students get from research supervisors/mentors or the more productive the mentoring relationship between a mentor and a mentee, the greater the chances of success in their research writing. The finding agrees with Seligman et al.’s (2009) submission that a positive mentoring relationship creates feelings of self-awareness and self-confidence which in turn influence student performance.

Integrative Model for Student’s Achievement Outcomes in Research Writing

The factorial ANOVA computation of self-efficacy, student engagement and mentoring on student’s achievement outcome in research writing yielded a statistically significant effect: \( F(1,249)=9.56, p<.002 \), and a descriptive cell
statistics for the factor combinations (refer to Table 5, Descriptive Cell Statistics) further suggests that students with high self-efficacy, high student engagement, and positive mentoring is expected to have a very high achievement outcome in research writing. This means that students with a triad combination of high self-judgment about their research writing abilities, and invested more time and effort on their research, and received the right guidance/advising from their research mentor are better placed to get higher achievement outcomes in research writing.

In contrast, students with low self-efficacy, high student engagement, and positive mentoring are expected to have moderately high levels of achievement outcomes in research writing. The explanation is that even if a student was well-mentored and gave a high commitment to his/her research task, their doubtful or poor self-judgment about their research writing abilities will somewhat undermine their performance, and thus lead to a moderately high achievement outcome.

Additionally, the result suggests that students with low self-efficacy, low engagement and negative mentoring are likely to have the lowest levels of achievement outcomes in research writing. This means that a horrible combination of poor self-judgment in one’s research abilities, poor engagement in the research task, coupled with poor/ineffective research guidance will certainly lead to a very low achievement outcome in research writing.

Furthermore, the result suggests that students with high self-efficacy, low engagement and positive mentoring are likely to have mildly low achievement outcomes in research writing. The explanation for this is that favourable self-judgment about one’s ability to conduct research, and an effective mentoring relationship cushions the negative effect the poor commitment to the research would have brought, thus leading to a mildly low achievement outcome in research writing.

The interaction effect when explained using the core assumptions of the Social Cognitive Theory by Bandura (1977) which holds that human functioning is moulded by the interaction of personal, behavioural, and environmental factors would imply that even though self-efficacy, student engagement and mentoring are proven to have independent effects on student achievement outcomes in research writing, they also have a combined effect. This is true to a large extent because, in learning and regarding performance outcomes, there is the likelihood of a convergence of multiple factors which could be psychological, behavioural, social, motivational, etc.

As regards to student’s achievement outcome in research writing, it is the researcher’s take, that student achievement outcome in research writing is beyond strong competency beliefs, committed engagement, or effective mentoring as mere independent factors, to an integration of the three factors because they are functionally interwoven and operates simultaneously in determining achievement outcomes in research writing.

Thus, the researcher suggests pulling together the three factors (self-efficacy, student engagement, and mentoring) into an integrative model in predicting a student’s achievement outcome in research writing. In this regard, the model will deepen our understanding of the diverse nature of predictor variables to learning outcomes, their interconnection, and how they sometimes interact to predict those outcomes. For example, a student may hold favourable self-judgment or have high perceived abilities (self-efficacy) regarding a given academic task (e.g. essay writing) but this doesn’t automatically translate into success if the student does not partake (student engagement) in the activity. The same may be likely for students who may even partake in the essay writing with those high held beliefs about their abilities but may still fall short of success if he/she isn’t provided with requisite advising and guidance by a more knowledgeable person (mentoring).

Hence, this model is put forward as an integrative analysis of achievement outcomes in research writing because it combines the power of self-efficacy which itself motivates students to exhibit control over their academic tasks, with a quality time and effort devoted to the tasks, with a quality supervising provided by a research mentor that guides the student to carry out the tasks practically and efficiently.
The model is explanatory in nature, and it draws from the interconnection of self-efficacy, student engagement, and mentoring as personal, behavioural, and environmental factors at the student’s own level. The model provides a detailed explanation of the combined influence these three factors on students’ achievement outcomes in research writing. As shown by the findings of the study, a student’s level of attainment as regard research writing is in part a function of the interactive influence of the three variables: self-efficacy, mentoring, and student engagement and partly a function of the factor level combinations of the three variables.

According to Badura’s SCT (1977, 1986), human functioning operates within a system of triad reciprocity (A dynamic interaction among personal factors, behavioural patterns, and environmental influences) which itself has no permanent pattern of reciprocal interaction, but is rather prompted by prevailing situational influences, activities/task or chances.

The interaction finding of this study is in line with the above assumption because it reveals that student’s achievement outcomes in research writing operates within the boundaries of dynamic and interactive influence of self-efficacy, student engagement and mentoring. Thus, suggesting that achievement outcome in research writing is a manifestation of an integrated influence of self-efficacy, student engagement and mentoring, and of their respective factor level combinations.

Given the 3-way interaction as shown by the finding (refer to Table 4, page 19), the proposed integrative model will be practical determinant of achievement outcomes in research writing, and going by the combination of the different factor levels of the three variables as revealed by the descriptive cell statistics (refer to Table 5, page 21), the following achievement outcomes in research writing are likely:

- High self-efficacy × high student engagement × positive mentoring = high achievement outcome.
- Low self-efficacy × high student engagement × positive mentoring = moderately high achievement outcome.
- High self-efficacy × low student engagement × positive mentoring = low achievement outcome.
- Low self-efficacy × low student engagement × negative mentoring = very low achievement outcome.

The model expansively lays out the interconnection of the three variables and the relative effects resulting from their factor level combinations, thereby drawing attention to the vital role each variable play in the model at any time, and more so the significance of their joint influence on student’s achievement outcomes in research writing.

**Summary**

The study examined the effect of self-efficacy (PF), student engagement (BF) and mentoring (EF) and their interaction effect on student achievement outcome in research writing. Based on the review of literature, four hypotheses were formulated which guided the study and were tested using a one-way and factorial ANOVA.

The results were statistically significant and the overall findings indicated a combined effect of personal, behavioural and environmental factors on achievement outcomes in research writing, suggesting that students with high self-efficacy, high engagement and positive mentoring are better placed to get high achievement outcomes in research writing, compared to students with low self-efficacy, low engagement and negative mentoring are most likely to get a very low achievement outcome in research writing.
Conclusions

From the human agency perspective of the SCT, humans have the ability to influence their own course of events, and for the fact that research writing is primarily an individual initiative; it is assumed that students are able to influence their research outcomes either through intentionality, forethought, self-reactiveness or self-reflectiveness.

However, environmental factors that support personal choices and behaviour are likely to result in favourable achievement outcomes. Thus, the researcher concludes that those students who combined high self-efficacy with much-invested effort in their research and had effective research mentoring are likely to have high achievement outcomes in their research writing.

The researcher also concludes that even if a student has low self-efficacy, as long as he/she engaged highly in the research task and was well-mentored, he/she is inclined to make positive gains in research writing. While students who though had high self-efficacy and positive mentoring, but low engagement are susceptible to low achievement outcome, and most likely an extremely low achievement outcome for students with low self-efficacy, low engagement and negative mentoring.

Additionally, based on the core assumptions of Bandura’s (1977) SCT, the researcher further concludes that achievement outcomes in research writing goes beyond self-efficacy beliefs, engagement in research or mentoring as mere independent predictors to an interactive determinant because according to Bandura and Cervone (1986), personal factors, behavioural patterns, and environmental events interacts to influence one another.

Hence, based on the findings of the study, the researcher further concludes that self-efficacy, student engagement and mentoring function as an integrated whole that predicts student’s achievement outcomes in research writing.

Recommendations

The researcher recommends that educators and school administrators should recognize the impressiveness of self-efficacy and its effect on achievement outcome, and start policies and programs that would build and improve task-related self-efficacy of students, in this case research writing, because task-related self-efficacy increases effort and determination towards daunting tasks like research writing, thereby increasing the chances of successful completion of the tasks at hand (Barling & Beattie, 1983). The researcher equally suggests the following for the student’s self-efficacy:

(a) Teachers should try to convey optimism that everyone is capable of successfully carrying out their research projects. This will help to build the students’ psychological needs of competence.
(b) All educators should strive to advance the students’ views of their own capabilities, specifically the skills and knowledge necessary to bring progress in research writing or related courses.
(c) Educators should promote teacher-student interpersonal relationship by showing care, and concern to students undertaking research. This will address the students’ psychological needs of relatedness, which will in turn promote their self-efficacy.

The findings also provide evidence that student engagement is a determinant of achievement outcomes in research writing. Thus, the researcher recommends the following:

(a) Educators should encourage active student participation in an academic task and offer positive and effective guidance to students from the point of conceptualization to writing the research draft, up to the completion of the research paper. This will ensure positive gains by the student in their research endeavours.
(b) Educators should recognize that they have a responsibility to promote student participation in academic tasks such as research writing. They should be approachable and be responsive to the research needs of students. This will make students be more committed and work harder to accomplish their research task.
(c) If active student engagement is to be promoted, then faculty should create support services such as research advising centres that will specifically address the research needs of students undertaking research writing. These support services should be made a core institutional culture. This will make students feel valued and their efforts supported by the institution, a feeling which will promote their sense of belonging, and possibly trigger an active engagement.

In one of the findings of this study, research mentoring was proven to be a critical determinant of student’s achievement outcome in research writing. Thus, the researcher recommends that:
(a) Faculty should strive to promote productive mentor-mentee relationships as students undertake their research writings. This will likely enhance students' research experience, morale, and competency beliefs.

(b) Faculty members who are assigned the responsibility to offer advising/guidance to students in their research should be rewarded upon the completion of the research. This should be incorporated into the institutional systems of rewards and promotions. If this is done, it will motivate faculty members to give high priority to effective/positive mentoring.

(c) Faculty administration should play a more active role in the screening and assigning of faculty members to offer research guidance to students undertaking research. This will ensure that only those faculty members with high mentoring abilities are assigned that responsibility.

Implications of the Study

1. Being a research-oriented university, the researcher believes that the above recommendations if put into some sought of policy framework will likely benefit students whose optimal performance outcomes about research writing will not only be guaranteed but will make them productive future researchers.

2. An implementation of the above recommendations will equally bring credit to teachers and mentors who contributed to the success of the student, either by way of implementation of the policy recommendations in the classroom or offered guidance and advising to the students in their field works.

3. The recommendations in this study can serve as a basis for instructional design and curriculum development for research methods and related courses across different schools and departments of the university.

4. With the findings and recommendations, greater awareness can be instilled in students, educators, and school administrators of the strong influence of self-efficacy, student engagement and mentoring on student achievement outcome in research writing, and thus the need to treat these variables with seriousness like other proven determinants of achievement outcomes. This will have positive implications by way of enhancing the learning experiences of students and possibly increase their chances of success in research writing and in other subject areas.

5. Furthermore, the researcher believes that the findings and recommendations of this study will have implications for policy and practice that will facilitate in engendering the prestige and reputation of the university, and can as well motivate students to engage in publishable and practical research as part of the university’s mission statement.

REFERENCES


Matters of Behaviour  ISSN 2517-6048


