# PRESERVICE TEACHERS' BEHAVIOURAL, EMOTIONAL AND COGNITIVE ENGAGEMENT EFFICACY

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**Abstract**
The study examined preservice teachers' level of teaching engagement efficacy with recourse to their behavioural, emotional and cognitive engagement efficacy. Also, the sensitivity of their teaching engagement efficacy to their demographic characteristics (sex, age and programmes of study) was considered. The survey design through census involved all 379 preservice teachers on various teacher education programmes in the University of Cape Coast. The study found out that preservice teachers' level of teaching behavioural, emotional and cognitive engagement efficacy was high. Comparably, their teaching behavioural engagement efficacy was the highest. Their demographic characteristics (sex, age and programmes of study) did not influence their teaching engagement efficacies. Generally, the preservice teachers were perceived to have the capability to engage their prospective students, thereby providing effective instruction. However, teacher educators should provide preservice teachers with more strategies to engage their students emotionally and cognitively to achieve very high synergistic results in their prospective students.

**Keywords:** Classroom; instruction; management; preservice teacher; quality; self-efficacy; student engagement; teaching.

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### 1. Introduction

Over hundreds of years, the traditional classroom was where the teacher was the only active participant in the teaching process (Hettler, 2015). This approach which respected the teacher was rejected vehemently because it was considered unproductive since it made students passive in the teaching process; it impeded their creativity (Bonwell & Eison, 1991). It was Dewey and Dewey (1915) who argued for student engagement in the teaching process. The scholars observed that the teacher and the books were no more the only educators but recognized the ears, eyes, and hands, and in effect, the whole body as sources of knowledge. The teacher was basically to start the teaching process. It has, therefore, become paramount for teachers to be able to engage their students during classroom instruction. Assessing preservice teachers' ability to engage their prospective students in this contemporary era is therefore crucial in highlighting an essential component of their classroom instructional effectiveness.

Contemporary empirical models of instructional effectiveness, for example, the New South Wales quality teaching model and Danielson' framework for teaching, have all projected the need for teachers to engage their students in the classrooms to ensure quality teaching and learning. In the quality teaching model, the engagement sub-construct of the model's quality learning environment dimension postulates that high engagement is identified by on-task behaviours that signal a serious investment in-class work (NSW Department of Education & Training, 2003). The Danielson' framework for teaching, developed as a comprehensive approach to teacher professional learning from preservice teacher preparation to teacher leadership, also stresses student engagement in its instructional domain as a key prerequisite for teachers in achieving instructional effectiveness. Scholars, professional teacher educators and education researchers are clear as to what constitutes an effective instruction. However, empirical knowledge on preservice teachers' ability to enforce effective instruction through student engagement that focuses on behavioural, emotional and cognitive engagement seems missing in the educational literature. Gauging preservice teachers' self-efficacy to engage their prospective students is vital in predicting their professional success in teaching and to provide them with appropriate training before they are launched into teaching. This is reasonable since self-efficacious teachers are resilient in teaching to meeting learners' needs (Pendergast et al., 2011).

The concept of student class engagement has been used to differentiate it from student class participation. Students behaving well, raising their hands and answering questions do not mean they are engaged (Johnston et al., 2015), rather a manifestation of class participation. Wasserstein (1995) asserted that engaged students are self-motivated, and not just busy students. Trowler (2010) defined student engagement as:

> the investment of time, effort and other relevant resources by both students and their institutions intended to optimise the student experience and enhance the learning outcomes and development of students and the performance, and reputation of the institution (p. 6).

Axelson and Flick (2011) explained engagement as students' interest, involvement and connectedness with their courses, one another, and their institutions of instruction. Schlechty (2011) sees students engaged at five levels: true engagement (sees activity as personally meaningful and worthy of trying to get it right); strategic compliance (concerned about grade, acceptance and approval and not doing it for the task itself); ritual compliance (focused on minimum requirements and seeks to avoid confrontation), retreatism (disengaged from current goals with attention on different things) and rebellion (completely disengaged and acting out). It is this meaningful

connection that is expected of students; the very basis of teachers engaging their students in the classrooms. Fredricks et al. (2004) identified three key components of student engagement as behavioural engagement, emotional engagement and cognitive engagement. Behavioural engagement addresses issues such as attendance, involvement and absence of dysfunctional behaviours. Emotional engagement addresses issues of affective reaction such as interest, enjoyment or a sense of belonging. Cognitive engagement focuses on students' investment in learning, seeking to go beyond standards and appreciation of challenge. Generally, student engagement focuses on behaviours such as students' sustained interest and attentiveness, focus on work, enthusiasm for work and seriousness (NSW Department of Education & Training, 2003).

Ensuring that learners are engaged during classroom instruction by teachers, is critical to teaching due to numerous empirical evidence gathered in support. Student engagement is positively related to students' success (e.g., Klem & Cornell, 2004; Pascarella & Terenzini, 2005), and retaining students' school interest (e.g., Yair, 2000). It also facilitates the development of knowledge, attitudes and skills which permits learners to accomplish previously identified lesson outcomes (e.g., Walls, 1999). When students are actively engaged, they are seen to exercise initiative in questioning, contributing to group task and assisting peers (e.g., Killen, 2005).

According to Walls (1999), for students to experience high engagement during instruction, teachers are to create a self-motivated educational environment that allows these students to rehearse every concept being learnt. This shows that it is a purposeful activity from the teacher in the teaching process. Hence, a teacher needs to possess the skills and capabilities to deploy resources during classroom instructional engagement with their students.

The current study, therefore, examines preservice teachers' ability to engage their students behaviourally, emotionally and cognitively by using their teaching self-efficacy in student engagement as a proxy. Using teaching self-efficacy is relevant because the probability that a specific task will be completed successfully is intensified by the individual's perception of their capabilities for performing a task effectively (Sure, 2009).

Continuing from the introduction, the study presents an empirical review to identify gaps in extant studies. Next, it describes the methods employed to examine preservice teachers' level of engagement efficacies, and the influence of their demographic characteristics on their engagement efficacies. This is followed by the presentation of the results, the discussion of which is the topic of the penultimate chapter. Finally, conclusions are drawn and recommendations proffered to strengthen the quality of preservice teacher education.

## 2. Empirical Literature

A plethora of studies have provided evidence for preservice teachers' engagement efficacy. Whilst some studies found preservice teachers to be moderately efficacious (e.g., Moalosi & Forcheh, 2015), others found them to be highly efficacious (e.g., Senler & Sungur, 2010; Sarfo et al., 2015; Ma & Cavanagh, 2018). In a qualitative study, Hunter (2016) found the preservice teachers to have high behavioural engagement efficacy. Generally, the focus of these studies has been on preservice teachers' overall engagement efficacy with limited attention on their behavioural, emotional and cognitive engagement efficacy. Knowledge in these specific engagement efficacies is important to direct the attention of teacher educators on the specific preservice teachers' engagement skills to further develop. Hence, the research question: *What is preservice teachers' level of engagement efficacy in terms of behavioural, emotional and cognitive engagement about teaching?*

Previous studies had also concentrated attention on the influence of preservice teachers' characteristics on their teaching engagement efficacy. Whilst Moalosi and Forcheh (2015) found

gender to influence engagement efficacy where female preservice teachers were found better than their male counterparts, Sarfo et al. (2015) found gender not to influence preservice teachers' engagement efficacy. As Moalosi and Forcheh (2015) and Lesha (2017) found age to positively influence engagement efficacy, Shaukat and Iqbal (2012) found that younger teachers were better in engaging students than older teachers. Yet, no significant interaction was found between gender and age (Moalosi & Forcheh, 2015). The current study pays attention to the influence of preservice teachers' age, gender and programmes of study on their behavioural, emotional and cognitive engagement. Hence the hypothesis: *there is no statistically significant difference in preservice teachers' engagement efficacies (behavioural, emotional and cognitive engagement efficacy) based on sex, age and programmes of study.*

## 3. Methods
### 3.1 *Design, Population and Sampling*
The descriptive cross-sectional survey design was employed to examine preservice teachers' level of behavioural, emotional and cognitive engagement efficacy. This makes the study a prerequisite for conclusions and generalisations (Osuala, 2001). The population for the study was 379 preservice teachers reading Management (n = 120), Accounting (n = 150), Economics (n = 56) and Social Studies (n = 53) programmes. These are preservice teachers who had completed Methods of Teaching course in their various subject curricula. They had also experienced micro-teaching practice at the university and were waiting to have the school experience. Hence, the study assessed their belief in their own abilities to engage their students for effective teaching and learning. The census survey involved all the preservice teachers on the aforementioned teacher education programmes. By this method, the highest accuracy was assumed in the study since no element of chance was left (Kothari, 2004).

### 3.2 *Instrumentation*
The Teacher Sense of Efficacy Scale (TSES) developed by Tschannen-Moran and Woolfolk Hoy (2001) was adapted to develop the Student Engagement Efficacy Scale-Questionnaire (SEE-Q) for the study. The TSES has widely been accepted and used by various researchers in measuring preservice teachers' efficacy in instructional strategies, classroom management and student engagement. The last eight items (items 17-24) which measure student engagement efficacy were drawn from the TSES and converted to statements on the SEE-Q.

### 3.3 *Instrument Validation*
A preliminary Exploratory Factor Analysis (EFA) was performed on the SEE-Q to determine if three engagement efficacy factors could be obtained. The EFA with Promax rotation yielded a Kaiser-Meyer-Olkin measure of sampling adequacy of .887, Bartlett's test of sphericity, $\chi^2$ = 1326.613, $p < .001$, which indicated that the correlation among the generated factors was adequate for the test. Three factors were obtained with an extracted variance of 76.07% and a minimum loading of .529 and a maximum loading of .941. The three factors were then subjected to a Confirmatory Factor Analysis (CFA) using Analysis of Moment Structures (AMOS). Figure 1 presents the three-factor engagement efficacy model and Table 1 presents its fit indices. BE (Behavioural Engagement), EE (Emotional Engagement) and CE (Cognitive Engagement).
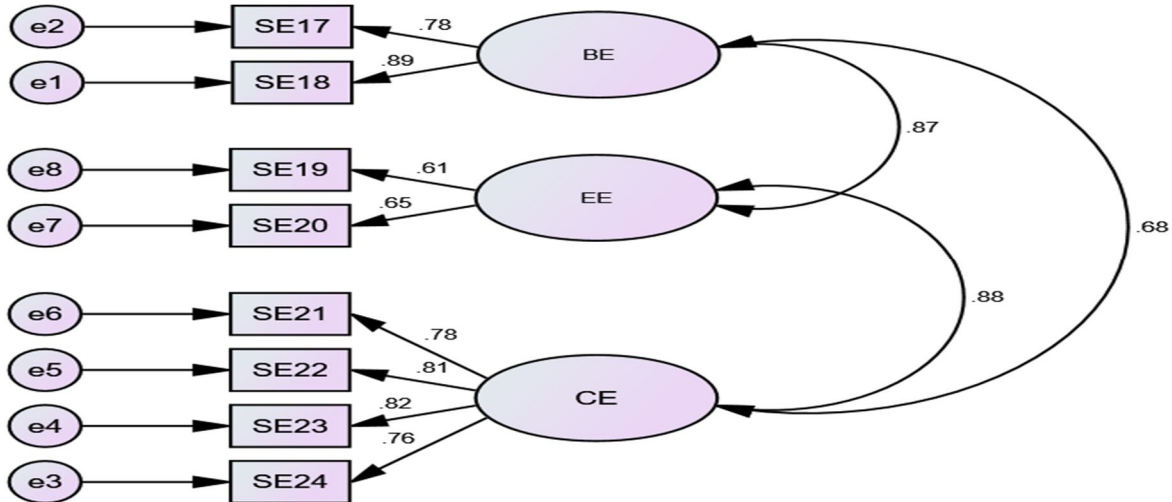
*Figure 1*: Three-factor engagement efficacy model

**Table 1: Goodness of Fit Indices for Engagement Efficacy Scale**

| Fit Indices | Estimates | Threshold | Reference |
|---|---|---|---|
| $\chi^2$ | 67.242** | > .05 | Hair et al. (2006) |
| CMIN/DF | 3.95 | ≤ 2 or 3 | Schreiber et. al (2006) |
| CFI | .96 | ≥.90 | Kline (2013) |
| NFI | .95 | ≥.90 | Kline (2013) |
| IFI | .96 | ≥.90 | Kline (2013) |
| TLI | .94 | ≥.90 | Kline (2013) |
| RMSEA | .09 | ≤ .08 | Schreiber et. al (2006) |
| SRMR | .04 | ≤ .08 | Kline (2016) |

Note: CMIN/DF: Ratio of χ2 to df; CFI = Comparative Fit Index; NFI = Normed Fit Index; IFI = Incremental Fit Index; TLI = Tucker-Lewis Index; RMSEA= Root Mean Square Error of Approximation; SRMR = Standardized Root Mean Residual; **$p < .001$.

The goodness of fit indices provides whether exact fit ($\chi^2$ not significant) or approximate fit (SRMR ≤ .08) is tenable (Asparouhov & Muthen, 2018), to allow for the examination of the standardised regression weights (loading) and Average Variance Extracted (AVE) for assessing construct validity. All the indices, except for RMSEA, communicate that the SEE-Q is approximately fit (SRMR ≤ .08) for the three-factor engagement efficacy construct. The item loadings, AVE and reliability are displayed in Table 2.

**Table 2: Item Loadings, AVE and Reliability for Student Engagement Self-Efficacy**

| Factors | Items | Loading | AVE | Cronbach's α | McDonald's ω |
|---|---|---|---|---|---|
| Behavioural Engagement | SE17 | .779** | .70 | .820 | .820 |
| | SE18 | .894** | | | |
| Emotional Engagement | SE19 | .612** | .40 | .567 | .567 |
| | SE20 | .646** | | | |
| Cognitive Engagement | SE21 | .783** | .63 | .870 | .870 |
| | SE22 | .812** | | | |
| | SE23 | .822** | | | |
| | SE24 | .757** | | | |
| SEE-Q | | | | .883 | .889 |

Source: Fieldwork (2019)                         \*\**p* < .001

All the factor loadings exceeded the minimum threshold of .5 (Apostolakis & Stamouli, 2006) and they were significant at *p* < .05. Apart from the emotional engagement efficacy AVE which is quite lower than the .5 AVE criterion (Fornell & Larcker, 1981), the rest adequately met the condition of construct validity. The composite reliability as shown by the Cronbach' alpha (α = .883) and the McDonald omega (ω = .889) exceeded the minimum threshold of .7 (Huck, 2004), which made the instrument (SEE-Q) fit for purpose.

**3.4 *Instrument Administration***

Ethical clearance was obtained from the Head of the Department, Department of Business and Social Sciences Education, University of Cape Coast and Institutional Review Board of the same university to gather data for the study. The preservice teachers were met at their various lecture halls for the administration of the instrument. The administration was done after the preservice teachers had ended their micro-teaching on the University's campus and were prepared for the school experience. The purpose of the study was explained to them and they were made to give written consent. The SEE-Q was administered to them for which they were told to provide candid responses to the best of their knowledge. Additionally, they were assured of confidentiality and anonymity. Since the survey was easy for the respondents to complete, it took them fifteen minutes to provide responses and submit accordingly. In all, 335 valid questionnaires were obtained with a return rate of 88.39%.

**3.5 *Data Processing and Analysis***

The data gathered was screened to identify and remove incomplete and invalid questionnaires, after which it was coded and entered into SPSS version 22 for data processing. Frequency and percentage were used to check for data entry errors, and generate results on their demographic characteristics. Mean and standard deviation were used to determine the preservice teachers' level of engagement efficacy. The scale mean score interpretation is given as follows: 1.00-1.49 (*Very low*); 1.50-2.49 (*low*); 2.50-3.49 (*Moderately*); 3.50-4.49 (*High*); 4.50-5.00 (*Very High*). Repeated measures analysis of variance (ANOVA) was used to determine differences in preservice teachers' engagement efficacies (behavioural, emotional and cognitive) which aided in determining their possible strengths and weaknesses in engaging their prospective students. Finally, three-way (2*3*4) Multivariate Analysis of Variance (MANOVA) was used to determine

differences in preservice teachers' engagement efficacies based on sex, age and programmes of study.

## 4.  Characteristics of the Preservice Teachers

The preservice teachers' sex, age and programmes of study were examined. By these categorical variables, the sensitivity of preservice teachers' behavioural, emotional and engagement efficacy to such characteristics was examined. Results on these variables are presented in Table 3.

**Table 3: Preservice Teachers' Sex, Age and Programmes of Study**

| Variable | Subscale | N | % |
|---|---|---|---|
| Sex | Male | 216 | 64.5 |
|  | Female | 119 | 33.5 |
| Age (in years) | 20-22 | 177 | 52.8 |
|  | 23-25 | 116 | 34.6 |
|  | 26+ | 42 | 12.5 |
| Programmes of Study | Accounting | 131 | 39.1 |
|  | Management | 119 | 35.5 |
|  | Economics | 50 | 14.9 |
|  | Social Studies | 35 | 10.4 |

Source: Fieldwork (2019)

More than half of the preservice teachers (n = 216, 64.5%) were males exceeding the female preservice teachers by 97 (31%); this creates an impression that higher teacher education in Ghana is predominantly male-dominated. The preservice teachers were clustered around the age ranges of 20-22 years (n = 177, 52.8%) and 23-25 years (n = 116, 34.6%) which summed up to 233 (69.55%). They could describe their belief in their ability to engage their prospective students, which therefore served as a good approach in gauging their instructional engagement effectiveness when they finally transition into the role of a professional teacher in various senior high schools in the country and beyond. Those preservice teachers trained to teach the Business programmes (Accounting and Management) outnumbered those in the Social Sciences (Economics and Social Studies). It seems the Business Education programmes were highly preferred and by implication, the findings are likely to be influenced by the preservice business teachers.

## 5.  Results

### 5.1 Preservice Teachers' Level of Behavioural, Emotional and Cognitive Engagement Efficacy

Table 4 presents the results of preservice teachers' level of engagement efficacy to gauge their instructional engagement effectiveness.

**Table 4: Preservice Teachers' Level of Engagement Self-Efficacy**

| Engagement Factors | *M* | *SD* | Interpretation |
|---|---|---|---|
| Behavioural Engagement | 4.31 | .75 | High |
| Emotional Engagement | 3.94 | .92 | High |
| Cognitive Engagement | 3.89 | .80 | High |
| Level of Engagement Efficacy | 4.05 | .82 | High |

Scale *M*: 1.00-1.49 (*Very low*); 1.50-2.49 (*low*); 2.50-3.49 (*Moderately*); 3.50-4.49 (*High*); 4.50-5.00 (*Very High*).
Source: Fieldwork (2019)

The preservice teachers generally indicated that they were highly efficacious to engage their prospective students ($M$ = 4.05, $SD$ = .82). They were of the view that they could engage their students behaviourally ($M$ = 4.31, $SD$ = .75). Specifically, they indicated that they could get students to believe that they could do well in schoolwork ($M$ = 4.29, $SD$ = .77) and help them to value learning ($M$ = 4.32, $SD$ = .73). This would certainly encourage their students to always attend classes and desist from dysfunctional behaviours that might disrupt academic work. Their high emotional engagement efficacy was equally encouraging to enforce effective instructional intercourse with their students. Their ability to motivate low-interest students for school work ($M$ = 4.10, $SD$ = .93) and provide assistance to families in helping their children do well in school ($M$ = 3.78, $SD$ = .91) were remarkable. Finally, their ability to ensure that students operate at a higher level of cognition is worth mentioning. They believed they could help students to think critically ($M$ = 3.92, $SD$ = .79) and foster their creativity ($M$ = 3.93, $SD$ = .80) as they got through to the most difficult students ($M$ = 3.72, $SD$ = .85). The highest mean (4.31) was observed for behavioural engagement efficacy with the highest congruity in the preservice teachers' responses ($SD$ = .75). This, therefore, suggested that behavioural engagement is the highest engagement efficacy factor among the rest. To confirm this observation, a repeated-measures ANOVA was conducted at .05 level of significance. The results are presented in Table 5.

**Table 5: Tests of Within-Subjects Effects for Engagement Efficacy Factors**

| Source | | Type III Sum of Squares | df | Mean Square | F | Sig. | $\eta_p^2$ |
|---|---|---|---|---|---|---|---|
| Engagement | Sphericity Assumed | 34.896 | 2 | 17.448 | 84.344 | <.001 | .202 |
| | Greenhouse-Geisser | 34.896 | 1.988 | 17.552 | 84.344 | <.001 | .202 |
| | Huynh-Feldt | 34.896 | 2.000 | 17.448 | 84.344 | <.001 | .202 |
| | Lower-bound | 34.896 | 1.000 | 34.896 | 84.344 | <.001 | .202 |
| Error(Engagement) | Sphericity Assumed | 138.187 | 668 | .207 | | | |
| | Greenhouse-Geisser | 138.187 | 664.049 | .208 | | | |
| | Huynh-Feldt | 138.187 | 668.000 | .207 | | | |
| | Lower-bound | 138.187 | 334.000 | .414 | | | |

Source: Fieldwork (2019)

The preliminary Mauchly's test for sphericity was not violated, $\chi2$ (2) = 1.987, $p$ = .370. Hence, the sphericity assumed report proves that the differences in the engagement efficacy factors are statistically significant, F(2) = 17.448, $p$ < .05, $\eta_p^2$ = .202. Therefore, the null hypothesis of no significant difference was rejected. Further evidence provided by the partial eta squared ($\eta_p^2$ = .202) emphasizes that there is a difference and that the observed difference is large following the effect size guideline by Cohen (1988). In Table 6, the Bonferroni pairwise comparison result supports in the ranking of the engagement efficacy factors.

**Table 6: Bonferroni Pairwise Comparison of Engagement Efficacy Factors**

| (I) Engagement | (J) Engagement | Mean Difference (I-J) | Std. Error | Sig. | 95% Confidence Interval for Difference LLCI | ULCI |
|---|---|---|---|---|---|---|
| 1 | 2 | .366[*] | .036 | <.001 | .278 | .453 |
|   | 3 | .419[*] | .034 | <.001 | .337 | .502 |
| 2 | 1 | -.366[*] | .036 | <.001 | -.453 | -.278 |
|   | 3 | .054 | .035 | .371 | -.030 | .137 |
| 3 | 1 | -.419[*] | .034 | <.001 | -.502 | -.337 |
|   | 2 | -.054 | .035 | .371 | -.137 | .030 |

Source: Fieldwork (2019)

As seen in Table 6, behaviour engagement efficacy (1) is statistically higher than both emotional (2) and cognitive (3) engagement efficacies. However, no significant difference is observed between emotional and cognitive engagement efficacy. The conclusion reached was that preservice teachers' behavioural engagement efficacy is higher than their emotional and cognitive engagement efficacies.

**5.2 Differences in Preservice Teachers' Engagement Efficacies based on Sex, Age and Programmes of Study**

The test of difference through MANOVA was conducted after the establishment of the correlation among the engagement factors. The reason for establishing correlation was that MANOVA is wasteful when dependent variables are uncorrelated (Tabachnick & Fidell, 2007). The assertion put forward by the authors is that the dependent variables should be correlated moderately in either direction or should be highly negatively related. Maxwell (2001), in support, indicated that the dependent variables should correlate from .3 to .7. Table 7 presents the correlation results among the dependent variables (behavioural, emotional and cognitive engagement efficacies).

**Table 7: Correlation Matrix for Engagement Efficacy Factors**

| Engagement Dimensions | Behavioural Engagement | Emotional Engagement | Cognitive Engagement |
|---|---|---|---|
| Behavioural Engagement | 1 | | |
| Emotional Engagement | .587[**] | 1 | |
| Cognitive Engagement | .583[**] | .619[**] | 1 |

** Correlation is significant at .01 level (2-tailed).
Source: Fieldwork (2019)

In Table 7, the correlation observed among the dependent variables is significant, and falls within the range of .3 and .7. Therefore, MANOVA was used to determine the differences in preservice teachers' engagement efficacies based on sex, age and programmes of study. In Table 8 the MANOVA results are shown.

**Table 8: MANOVA Results of Differences in Preservice Teachers' Engagement Efficacies Based on their Characteristics**

| Effect | | Value | F | Hypothesis df | Error df | Sig. | $\eta_p^2$ |
|---|---|---|---|---|---|---|---|
| Intercept | Pillai's Trace | .937 | 1550.659[b] | 3.00 | 311.00 | <.001 | .937 |
| | Wilks' Lambda | .063 | 1550.659[b] | 3.00 | 311.00 | <.001 | .937 |
| | Hotelling's Trace | 14.958 | 1550.659[b] | 3.00 | 311.00 | <.001 | .937 |
| | Roy's Largest Root | 14.958 | 1550.659[b] | 3.00 | 311.00 | <.001 | .937 |
| Sex | Pillai's Trace | .004 | .386[b] | 3.00 | 311.00 | .763 | .004 |
| | Wilks' Lambda | .996 | .386[b] | 3.00 | 311.00 | .763 | .004 |
| | Hotelling's Trace | .004 | .386[b] | 3.00 | 311.00 | .763 | .004 |
| | Roy's Largest Root | .004 | .386[b] | 3.00 | 311.00 | .763 | .004 |
| Age | Pillai's Trace | .027 | 1.403 | 6.00 | 624.00 | .211 | .013 |
| | Wilks' Lambda | .974 | 1.401[b] | 6.00 | 622.00 | .212 | .013 |
| | Hotelling's Trace | .027 | 1.398 | 6.00 | 620.00 | .213 | .013 |
| | Roy's Largest Root | .020 | 2.035[c] | 3.00 | 312.00 | .109 | .019 |
| Programmes | Pillai's Trace | .043 | 1.534 | 9.00 | 939.00 | .131 | .014 |
| | Wilks' Lambda | .957 | 1.534 | 9.00 | 757.04 | .132 | .015 |
| | Hotelling's Trace | .045 | 1.532 | 9.00 | 929.00 | .132 | .015 |
| | Roy's Largest Root | .030 | 3.143[c] | 3.00 | 313.00 | .025 | .029 |
| Sex * Age | Pillai's Trace | .001 | .035 | 6.00 | 624.00 | 1.000 | .000 |
| | Wilks' Lambda | .999 | .035[b] | 6.00 | 622.00 | 1.000 | .000 |
| | Hotelling's Trace | .001 | .035 | 6.00 | 620.00 | 1.000 | .000 |
| | Roy's Largest Root | .001 | .056[c] | 3.00 | 312.00 | .983 | .001 |
| Sex * Programmes | Pillai's Trace | .044 | 1.537 | 9.00 | 939.00 | .130 | .015 |
| | Wilks' Lambda | .957 | 1.539 | 9.00 | 757.04 | .130 | .015 |
| | Hotelling's Trace | .045 | 1.539 | 9.00 | 929.00 | .130 | .015 |
| | Roy's Largest Root | .033 | 3.443[c] | 3.00 | 313.00 | .017 | .032 |
| Age * Programmes | Pillai's Trace | .131 | 2.372 | 18.00 | 939.00 | .001 | .044 |
| | Wilks' Lambda | .874 | 2.393 | 18.00 | 880.13 | .001 | .044 |
| | Hotelling's Trace | .140 | 2.409 | 18.00 | 929.00 | .001 | .045 |
| | Roy's Largest Root | .093 | 4.861[c] | 6.00 | 313.00 | <.001 | .085 |
| Sex * Age * Programmes | Pillai's Trace | .057 | 1.503 | 12.00 | 939.00 | .117 | .019 |
| | Wilks' Lambda | .944 | 1.502 | 12.00 | 823.12 | .117 | .019 |
| | Hotelling's Trace | .058 | 1.500 | 12.00 | 929.00 | .118 | .019 |
| | Roy's Largest Root | .038 | 2.961[c] | 4.00 | 313.00 | .020 | .036 |

Source: Fieldwork (2019)

The test of homogeneity of variance-covariance matrices based on Box's M test reported statistical significance, M = 171.232, F(102, 9267.92) = 1.479, $p$ = .001. Hence, the assumption of the equality of homogeneity of variance-covariance matrices has not been met. Wilks' Lambda ($\Lambda_w$) was therefore reported in testing for statistical significance. It is clearly evident that there exists no statistically significant difference in the linear combination of behavioural, emotional and cognitive efficacies of preservice teachers based on their characteristics (main effects), that is, sex, F(3, 311) = .386, $p$ = .763, $\Lambda_w$ = .996; age, F(6, 622) = 1.401, $p$ = .212, $\Lambda_w$ = .974; and programmes of study, F(9, 757.04) = 1.534, $p$ = .132, $\Lambda_w$ = .957. Statistical significance was observed at the two-level interaction between age and programmes of study, F(18, 939) = 2.372, $p$ = .001, $\Lambda_w$ = .131. No significance was observed between sex and age, and sex and programmes of study for the two-level interactions. Also, no significance was observed at the three-level interaction (sex, age and programmes of study). Table 9 presents the univariate results.

**Table 9: Tests of Between-Subjects Effects**

| Source | Dependent Variable | Type III Sum of Squares | df | Mean Square | F | Sig. | $\eta_p^2$ |
|---|---|---|---|---|---|---|---|
| Corrected Model | BE | 11.594 | 21 | .552 | 1.169 | .277 | .073 |
| | EE | 18.540 | 21 | .883 | 1.546 | .061 | .094 |
| | CE | 15.205 | 21 | .724 | 1.634 | .041 | .099 |
| Intercept | BE | 1852.602 | 1 | 1852.602 | 3923.468 | <.001 | .926 |
| | EE | 1579.283 | 1 | 1579.283 | 2765.157 | <.001 | .898 |
| | CE | 1504.279 | 1 | 1504.279 | 3393.819 | <.001 | .916 |
| Sex | BE | .159 | 1 | .159 | .336 | .562 | .001 |
| | EE | .278 | 1 | .278 | .487 | .486 | .002 |
| | CE | .004 | 1 | .004 | .008 | .927 | .000 |
| Age | BE | 2.522 | 2 | 1.261 | 2.671 | .071 | .017 |
| | EE | 3.047 | 2 | 1.523 | 2.667 | .071 | .017 |
| | CE | 1.060 | 2 | .530 | 1.195 | .304 | .008 |
| Programmes | BE | 1.020 | 3 | .340 | .720 | .540 | .007 |
| | EE | .536 | 3 | .179 | .313 | .816 | .003 |
| | CE | 2.269 | 3 | .756 | 1.706 | .166 | .016 |
| Sex * Age | BE | .008 | 2 | .004 | .009 | .991 | .000 |
| | EE | .033 | 2 | .016 | .029 | .972 | .000 |
| | CE | .005 | 2 | .002 | .006 | .994 | .000 |
| Sex * Programmes | BE | 1.933 | 3 | .644 | 1.365 | .254 | .013 |
| | EE | 5.349 | 3 | 1.783 | 3.122 | .026 | .029 |
| | CE | .951 | 3 | .317 | .716 | .543 | .007 |
| Age * Programmes | BE | 2.231 | 6 | .372 | .787 | .580 | .015 |
| | EE | 8.603 | 6 | 1.434 | 2.511 | .022 | .046 |
| | CE | 6.482 | 6 | 1.080 | 2.437 | .026 | .045 |
| Sex * Age * Programmes | BE | 1.565 | 4 | .391 | .828 | .508 | .010 |
| | EE | 1.486 | 4 | .372 | .650 | .627 | .008 |
| | CE | 3.227 | 4 | .807 | 1.820 | .125 | .023 |
| Error | BE | 147.794 | 313 | .472 | | | |
| | EE | 178.766 | 313 | .571 | | | |
| | CE | 138.734 | 313 | .443 | | | |
| Total | BE | 6370.750 | 335 | | | | |
| | EE | 5398.500 | 335 | | | | |
| | CE | 5214.250 | 335 | | | | |
| Corrected Total | BE | 159.388 | 334 | | | | |
| | EE | 197.306 | 334 | | | | |
| | CE | 153.940 | 334 | | | | |

Source: Fieldwork (2019)　　　　　　　　　　Bonferroni adjustment $p < .017$

The corrected models for behavioural engagement efficacy, $F(21, 313) = 1.169$, $p = .277$; emotional engagement efficacy, $F(21, 313) = 1.546$, $p = .061$; and cognitive engagement efficacy, $F(21, 313) = 1.634$, $p = .041$ were not statistically significant. Hence, no significant differences were found in preservice teachers' behavioural, emotional and cognitive engagement efficacies for the main effects (sex, age, programmes of study) and the interaction effects (sex*age, sex*programmes of study, age*programmes of study, sex*age*programmes of study).

## 6. Discussion

The study examined preservice teachers' level of engagement efficacy to gauge their readiness to engage their prospective students behaviourally, emotionally and cognitively before they are launched into the teaching profession. This is essentially important due to the high impact of student engagement on students' academic successes (Klem & Cornell, 2004).

The study found out that the preservice teachers were highly efficacious in all three domains of the student engagement efficacy (behavioural, emotional and cognitive). This is a novel finding, and it is due to the study's focus and research approach employed. The focus was on preservice teachers' specific engagement efficacies, and not just their general engagement efficacy as seen in previous studies. The quantitative approach adopted allowed for the assessment and comparison of their behavioural, emotional and cognitive engagement efficacies. This was missing in Hunter's (2016) study because the qualitative approach was employed which highlighted only preservice teachers' behavioural engagement efficacy as the reason for their high teaching self-efficacy. The current study specifically assessed preservice teachers' behavioural, emotional and cognitive engagement efficacies. It was found out that the preservice teachers' were behaviourally efficacious to engage their prospective students. This ability is key to quality teaching and learning since classrooms would be devoid of dysfunctional behaviours. This implies that instructional time can be used for substantive classroom issues than controlling inappropriate classroom behaviours. This is a classroom atmosphere needed to effectively engage students in lessons (NSW Department of Education & Training, 2003). It also found out that the preservice teachers were emotionally efficacious to engage their prospective students. This implies that they can foster students' learning. By this efficacy, they can sustain students' interest, encourage seriousness in them and keep them focused on classroom work. Also, the preservice teachers were cognitively efficacious to engage their prospective students. The exercise of this capability would help their prospective students to invest productive time in learning to achieve both target (what they are expected to do in a target situation) and learning needs (mastery of content in schools).

Previous pieces of evidence (e.g. Senler & Sungur, 2010; Sarfo et al., 2015; Moalosi & Forcheh, 2015; Ma & Cavanagh, 2018) suggest that preservice teachers are generally efficacious to engage their students. The current study supports previous evidence, and further indicate that this could be attributed to their high behavioural engagement efficacy as also found by Hunter (2016) as a reason for preservice teachers' high teaching self-efficacy. The current evidence projects that the difference between preservice teachers' behavioural engagement efficacy and emotional and cognitive efficacy is large (see partial eta squared in Table 5). The impression created is that the training of preservice teachers did not place adequate emphasis on the development of their emotional and cognitive engagement abilities. It is not enough for a teacher to adequately keep classrooms from dysfunctional behaviours, but also to sustain students' interest in whatever they learn, as well as keep them focused on their target and learning needs. Even though the preservice teachers are generally efficacious to engage their prospective students, the specifics relating to their emotional and cognitive engagement efficacies were not too impressive.

The study found out that the preservice teachers' behavioural, emotional and cognitive engagement efficacies were not sensitive to their sex, age and programmes of study. This finding is also new since previous studies only focused on preservice teachers' general engagement efficacy. In general, the insensitivity of preservice teachers' engagement efficacy to their sex was found by Sarfo et al. (2015). Therefore, the current evidence does not share in the idea that sex influences preservice teachers' engagement efficacy as found in other previous studies (e.g. Moalosi & Forcheh, 2015). Self-efficacy cannot be developed in a vacuum; it must be based on training or experiences provided to the preservice teachers. This could mean that if sex influences preservice teachers' engagement efficacy, then a particular sex (either male or female) might have been highly exposed to teaching. If this argument is flawed, then enough evidence must be provided by subsequent studies on the prior teaching experiences these preservice teachers have had based on their sex. This is to say that the prior teaching experiences of the preservice teachers must be

controlled to identify the true influence of their sex on their general and specific engagement efficacies.

The influence of age on preservice teachers' specific engagement efficacies was also deemphasized by the current study. Therefore, the study does not hold that age can influence preservice teachers' engagement efficacy as earlier found out (e.g. Shaukat & Iqbal, 2012; Moalosi & Forcheh, 2015; Lesha, 2017). As Moalosi and Forcheh, and Lesha found age to directly relate with teachers' engagement efficacy, Shaukat and Iqbal found younger teachers to be better. Even though one would generally expect age and engagement efficacy to directly relate, the evidence gathered by Shaukat and Iqbal clearly show that it is not about age but the quality of teacher education prospective teachers are exposed to on their programmes. It is, therefore, not surprising that this study did not find age to influence preservice teachers' behavioural, emotional and cognitive engagement efficacies.

The previous studies did not focus on the influence of preservice teachers' programmes of study on their general engagement efficacy. Again, this study highlights a novel finding that preservice teachers' programmes of study does not influence their behavioural, emotional and cognitive engagement efficacies. This once again draws attention to the quality teaching and training provided for preservice teachers to enhance their teaching self-efficacy in engaging students. None of the characteristics of the preservice teachers was found to be related to their specific engagement efficacies. If they had highly developed the teaching self-efficacy to behaviourally, emotionally and cognitively engage their prospective students, then the general quality of their teacher education might be responsible.

## 7. Conclusions and Recommendations

The study clearly shows that preservice teachers are highly efficacious to behaviourally, emotionally and cognitively engage their prospective students. However, their emotional and cognitive engagement efficacies were not too impressive as compared to their behavioural engagement efficacy. If teacher educators do not place enough emphasis on preservice teachers' development of emotional and cognitive abilities in engaging their prospective students, a very high students' academic performance would not be realized since student engagement influences students' academic performance. Teacher educators would need to provide preservice teachers with adequate teaching strategies needed to emotionally and cognitively engage their prospective students. It was established in the study that preservice teachers' sex, age and programmes of study did not influence their specific engagement efficacies. Hence, no special attention should be placed on these characteristics but rather on the quality of instruction and training provided on teacher education programmes. The current evidence is open and subjected to further discussions to strengthen knowledge, and development of preservice teachers' behavioural, emotional and cognitive engagement capabilities.

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