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*Research Article*

# Demographic Effect on Engaged Learning Practice of Undergraduate Students

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**Abstract**

Student engagement is viewed as learners' attention, interest, investment, and effort students expend in their work of learning. Studies and research in the field of education have revealed that students' engaged learning methods in science are increasingly focusing on aspects like behavioral, cognitive, and emotional engagement. Therefore, the purpose of this study was to identify engaged learning and demographic influences on such practices. The study was carried out with a sample of. A Likert scale-type questionnaire of 30 items was employed with 88 undergraduate students studying chemistry on two campuses of Kathmandu. Students were found to have better engagement in all dimensions of engagement. They showed higher behavioral engaged learning practice as compared to other two dimensions. No differences were established between behavioral engagement and gender, ethnicity, and religion. Similar findings were established for cognitive and emotional engagement practices. The implications of the findings were examined, including their value for future researchers in the same field of study, science teachers, and policymakers.

***Key Words:*** Chemistry, Dimensions of engagement, Demography

## Introduction

Research has established many factors to be responsible for influencing students' success in their academics. Many factors have been identified for the success and failure of students in their academics. According to, Svanum and Bigatti (2009) success of students in college depends on students' performance (such as grades for a particular subject or semester), determination to college outcomes, and less likely degree accomplishment. They further stressed that the studies on factors responsible for students' success are guided by the "engagement theory of student success".

Engagement in academic work is defined by Newmann, Wehlage, and Lamborn (1992) as the student's psychological investment and effort focused on acquiring the knowledge, skills, or crafts that the academic work is meant to foster. Engagement is believed to be the key idea for understanding and foreseeing the attainment of students' success from high school (Fall & Roberts, 2012). The engaged learning practices of students result in higher satisfaction in their subject and their school experience (Crotty, 1998). Students who engaged in a higher degree of engagement produced to be an academic success (Hu & Kuh, 2002). Studies claimed that students the other result of engaged learning could be observed in a higher level of satisfaction of the students in their subjects and school involvement (Tinto, 2012; Zyngier, 2008). In addition to this engaged learning practices results in higher performance in college (Handelsman et al., 2005). Similar findings were made by Dotterer and Lowe (2001) and Roorda et al. (2011) that school engagement affects academic accomplishment, which is the major objective for students to accomplish. Meanwhile, Fredericks, Blumenfeld, and Paris (2004) classified studies of engagement into behavioral, emotional, and cognitive engagement. Behavioral engagement involves attempting and following the regulations; emotional engagement includes morals, interests, and emotions; and cognitive engagement includes inspiration, effort, and plan (a strategy used).

Furthermore, behavioral engagement is experienced when pupils appear in the classroom, talk about what they are learning, and retain trying when the work is tough. "These students are taking notes, doing homework, listening carefully, posing questions, participating in small groups, and helping others. What happens when the teacher stops talking? Do students continue the conversation among themselves, moving toward the desired learning outcome?" Behavioral engagement in primary elementary grades expects future achievement on test scores, grades, and the decision to drop out of high school (Bedell, 2012). Behavioral engagement is based on one's immersion into the academic, social, and extracurricular progressions of school (Fredricks, Blumenfeld, & Paris, 2004). Behavioral engagement can be defined as specific pupil behaviors connected with learning, such as focusing, employing effort, captivating initiative, being determined despite failure, following directions and positively interacting with instructors and peers among others (Hattie & Anderman, 2013). Research indicates that students' behavioral engagement is likely to lead to greater academic achievement and school retention (Hattie & Anderman, 2013). Studies established a positive correlation between behavioral engagement and the academic performance of the students (Connell, Spencer, & Aber, 1994; Connell & Wellborn, 1991).The study of (Connell et al., 1994; Skinner et al., 1990) confirmed the correlation between the achievement and two dimensions emotional and behavioral in the combined form of student engagement.

However, cognitive engagement reflects a student's investment in learning. Learners who are cognitively engaged establish learning goals, self-regulate their behavior, and wish to go beyond the lowest necessities (Bedell, 2012). Fredricks et al. (2004) defined cognitive engagement as the aspect of engagement, which is based on pupil investment in school and the progressions of education. A cognitively engaged learner is considerate, planned, and eager to exercise the essential energy for the understanding of complex concepts or mastery of problematic skills (Christenson, Reschly, & Wylie, 2012). The research on cognitive engagement is often concerned with how much students invest in learning and whether they are willing to work extra to get better academic outcomes. In the context of cognitive engagement, Gamoran (1991)

acknowledged substantive engagement, which is similar to cognitive engagement showed a positive association to students' performance in terms of students' comprehensive understanding and ability to synthesize.

Moreover, emotional engagement replicates a pupil's satisfaction with and sense of belongingness to an educational institution. It is established by making associations and sensation of success at school. Once learners enjoy a subject, they are expected to value it in its own precise and follow further learning on their own. A helpful student-teacher relationship is a key source of students' emotional engagement. Strong emotional engagement in school may be associated with suppleness during stress (Bedell, 2012). Emotional engagement is defined as an engagement based on how learners identify with their educational institution (Fredricks et al. 2004). Identification with the educational institutions comprises belonging, valuing, or a feeling of being important to the school, as well as the gratitude of success in school-related outcomes (Christenson et al., 2012). The emotional engagement of students focuses on the degree of positive and/or adverse responses to instructors, contemporaries, peers, and school in general (Devito, 2016). Positive emotional engagement contributes to pupil bonds to school or other educational institutions and stimulus readiness of pupils to study and take part in other school-associated actions. The students' academic performance was correlated in a variety of ways with the emotional engagement categories (such as interest and value) (Schiefele, Krapp, & Winteler, 1992). Therefore, emotional engagement is also essential for improving pupils' academic achievement.

Additionally, Vygotsky (1978) argues on the "zone of proximal development" that refers to a level of understanding that learners can acquire when engaged in a task. He emphasizes that students can be engaged in their learning works meaningfully through the support of peers or teachers. He further adds that the meaningful engaged learning activities can stretch them beyond their existing knowledge level. He believes that the learning may not occur at one time of engagement rather it may take after the repeated thoughtful engagement. He focuses on interpersonal interaction and internalization as individual knowledge in learners learning context as a form of engaged learning (Liu & Matthews, 2005). Vygotsky believes in the active engagement of students "in their learning with the prospect of becoming self-directed, lifelong learners" (Verenikina, 2008, p. 165). He argues that "the teacher is the director of the social environment in the classroom, the governor and guide of the interactions between the educational process and the student" (Vygotsky 1997, p. 49). He believes that all learning is first accomplished through the language and students' thinking and their language comes to them as a cultural heritage through their interaction with others (Balkrishnan, 2009)

The engagement theory describes the success in academics shaped by the degree of engagement and involvement in campus activities and academics. "College student engagement is a multidimensional concept that many researchers have studied to understand aspects leading toward student success at the secondary and postsecondary levels of education" (as cited in Marx et al., 2016). Students who have a greater degree of engagement in their college activities come up with academic success (Hu & Kuh, 2002). Thus, the pieces of literature in the field of student engagement showed that engaged learning practice is crucial to student success in their academics and their goal. However, student engagement of college students is not widely addressed in existing literature (Marx et al., 2016). Science is a discipline, which demands more engaged learning practices and activities by the students as it is an experiment and activity-based discipline. However, there is very limited study on student engagement in science especially of college school students. Meanwhile, no study has been found on students' practices on engaged learning, especially in science. Nonetheless, no empirical study was found to have examined the students' engagement of science students', particularly on their behavioral, cognitive, and emotional engagement in the learning activities in the context of Nepal. In this context, the major thesis of this study is to examine the status of engagement learning practices of B.Ed level science students studying in the two particular Education campuses of Kathmandu valley. More specifically, the study examined the engagement practices of science students on three dimensions (behavioral, cognitive, and emotional) of engagement across their demographic variables.

**Materials and Methods**

The study was carried out with the science students studying at Tribhuvan University, studying at the undergraduate level. Due to time and resource limitations, the study was only conducted in the Kathmandu district. Since there are only two schools offering B.Ed. Science in the Kathmandu valley, the purposeful sampling was used in this study. Undergraduate college students enrolled in B.ED science courses on two campuses in the Kathmandu valley made up the study's target group. From the total number of undergraduate students registered in B.ED scientific courses at Tribhuvan University, a sample of 88 students was chosen. The total number of students that regularly attended classes on the campuses made up the sample..

This study examined the students' engagement in learning using a well-structured survey questionnaire. The common tool was created after researching numerous academic works on kids' interest in learning. Student engagement can be categorized in three ways (behavioral, cognitive, and emotional), as was covered in the earlier part, and those characteristics were taken into consideration when creating the tool. The expert was consulted after the original tool had been created to offer suggestions and make corrections. The tool was then prepared for pilot testing. A small group of 30 students were given the tool to test it once it was created. For each of the three engagement measures, the Cronbach's alpha test result was determined to be more than 0.70. Therefore the tool was found to be reliable for conducting the study. In order for validation of tool further correction in the tool was done according to the expert advice and suggestions. According to the reliability value and expert suggestion, the items of engagement was finalized. Tools once finalized, was implemented to the purposed sample of the students and data was calculated. As a result, the instrument was found to be trustworthy for carrying out the study. Further tool corrections were made in accordance with information and recommendations from experts in order to validate the tool. The items of engagement were decided in accordance with the reliability value and professional advice.

After being completed, the tools were applied to the intended student sample, and data were computed.

After preparing a reliable and valid tool, the tool will be implemented in a real sample of this study. The data obtained by the study will be analyzed by using the Statistical Package for the Social Science (SPSS) was used to analyze the data obtained from the survey. The chi square test of association was performed for finding the association of engaged learning practices with demographic features of students. A chi-square ($\chi^2$) statistic is a measure of the difference between the observed and expected frequencies of the outcomes of a set of events or variables.Using the test-retest approach and the Cronbach's alpha (α)=0.70 test in SPSS, the tools will be pre-tested on 10% of the sampled population on one campus (Division of Statistics + Scientific Computation, 2012). The tool will then be used for a pilot study. Pilot testing will be followed by the appropriate correction. For each of the three engagement measures, the Cronbach's alpha test result was determined to be more than 0.70. As a result, the instrument was found to be trustworthy for carrying out the study. Further tool corrections were made in accordance with information and recommendations from experts in order to validate the tool. The items of engagement were finalised in accordance with the reliability value and professional advice. Fair substantiation of the data was assured for face validity, the respondents and data sources were evaluated for content validity, the findings were cross-checked with the literature for construct validity, and finally, the findings were validated with theories and research for criterion validity.

**Findings of the Study**

The study aimed in finding the students engaged learning practices in three dimensions (Behavioral, Cognitive, and Emotional) of engagement. The study also aim in finding the effect of demography on students practice to engage learning mainly in three dimensions (Behavioral Engagement, Cognitive Engagement, and Emotional Engagement).

*Table 1 The undergraduate students' level of chemistry engagement in three dimensions of engagement.*

| Dimensions of Engagement | Mean | Std. Deviation |
|---|---|---|
| Behavioral Engagement | 4.06 | 0.36 |
| Cognitive Engagement | 3.93 | 0.45 |
| Emotional Engagement | 4.0 | 0.60 |

The study aimed to examine the engaged learning practices of undergraduate students on chemistry. The overall mean for behavioral engaged learning was found to be 4.06, which shows that students are better engaged behaviorally than that of cognitive and emotional aspect. The overall mean for cognitive engagement of students to their chemistry learning was found to be 3.93 which the lowest among the three dimensions of engagement. Moreover, the overall mean for cognitive engagement of students to their chemistry learning was found to be 4.0. The study showed students showed better engagement practice in all dimensions of engagement with the highest in behavioral engagement. aphic Factors and Students Practices to Engaged LearThis study finds the relationship of gender, caste, religion, and level with behavioral, cognitive and emotional engagement of the students. The chi square test was performed in each case for finding the differences of gender, ethnicity and religion.

*Table 2 Behavioral Engagement practices across gender*

| Gender | N | Mean | Df | $x^2$ value | P-value |
|---|---|---|---|---|---|
| Female | 61 | 4.05 | 15 | 13.50 | 0.56 |
| Male | 27 | 4.09 | | | |

The table shows the behavioral engagement of students concerning with their gender. A statistical test using chi square test was employed to explore whether Behavioral engagement of the students influenced by gender. The chi-square test of independence showed that there was no significant association between gender and behavioral engagement practice of the students, $x^2$ (15, N=88)=0.56, p >.01. Thus, we can say that there is no significant difference between genders of students in relation to behavioral engagement of students. This means that gender of the students does not have influence over behavioral engagement

*Table 3 Behavioral engagement across ethnic group*

| Ethnic group | N | Mean | df | $X^2$ | P-value |
|---|---|---|---|---|---|
| Brahmin and Chhetri | 47 | 4.06 | 30 | 20.37 | 0.91 |
| Janajati | 38 | 4.05 | | | |
| Dalit | 3 | 4.06 | | | |

The above table illustrates the students' behavioral engagement with respect to ethnic group. The chi-square test was employed to explore whether behavioral engagement differs across ethnic group of students. The chi-square test of independence showed that there was no significant association between ethnicity and behavioral engagement practice of the students, $x^2$ (30,$N$=88) = 0.91, $p$ >.01. The ethnic group of students does not make any significant difference behavioral engagement.

*Table 4 Behavioral Engagement practice across the religion*

| Religion | N | Mean | Df | $X^2$-value | P-value |
|---|---|---|---|---|---|
| Hindu | 65 | 4.06 | 45 | 42.55 | 0.58 |
| Buddhist | 15 | 4.14 | | | |
| Christian | 5 | 4.00 | | | |
| Others | 3 | 3.85 | | | |

The above table illustrates the students' behavioral engagement with respect to religion. The chi-square test was employed to explore whether behavioral engagement differs across religion of the students. The chi-square test of independence showed that there was no significant association between religion and behavioral engagement practice of the students, $x^2$ (45,$N$=88) = 0.58, $p$ >.01.

The religion of students does not make any significant difference behavioral engagement.

*Table 5 Cognitive Engagement practices across the gender*

| Gender | N | Mean | Df | $X^2$-value | P-value |
|---|---|---|---|---|---|
| Female | 61 | 3.93 | 23 | 25.26 | 0.34 |
| Male | 27 | 3.92 | | | |

The above table shows the cognitive engagement of students concerning with their gender. The chi-square test was employed to explore whether cognitive engagement differs across gender of the students. The chi-square test of independence showed that there was no significant association between gender and cognitive engagement practice of the students, $x^2$ (23,$N$=88) = 0.34, $p$ >.01. Thus, we can say that there is no significant difference between gender of students in relation to cognitive engagement of students. This means that gender of the students does not have influence over cognitive engagement.

*Table 6 Cognitive Engagement practices across the Ethnic group*

| Ethnic group | N | Mean | Df | $X^2$-value | P-value |
|---|---|---|---|---|---|
| Brahmin and Chhettri | 47 | 3.95 | 46 | 28.83 | 0.978 |
| Janajati | 38 | 3.86 | | | |
| Dalit | 3 | 4.28 | | | |

The above table illustrates the students' cognitive engagement with respect to ethnic group. The chi square test was employed to explore whether cognitive engagement differs across ethnicity of the students. The chi square test of independence showed that there was no significant association between ethnicity and cognitive engagement practice of the students, $x^2$ (46, $N$=88) = 0.97, $p$ >.01The ethnic group of students does not make any significant difference cognitive engagement.

*Table 7 Cognitive Engagement practices across the religion*

| Religion | N | Mean | Df | $X^2$-value | P-value |
|---|---|---|---|---|---|
| Hindu | 65 | 3.96 | 69 | 75.11 | 0.28 |
| Buddhist | 15 | 3.86 | | | |
| Christian | 5 | 3.80 | | | |
| Others | 3 | 3.61 | | | |

The above table illustrates the students' cognitive engagement with respect to religion. The chi-square test was employed to explore whether cognitive engagement differs across ethnicity of the students. The chi-square test of independence showed that there was no significant association between religion and cognitive engagement practice of the students, $x^2$ (69, $N$=88) = 0.28, $p$ >.01. The religion of students does not make any significant difference in cognitive engagement practices of the students.

*Table 8 Emotional Engagement practice across the gender*

| Gender | N | Mean | Df | $X^2$-value | P-value |
|---|---|---|---|---|---|
| Female | 61 | 3.96 | 18 | 23.09 | 0.187 |
| Male | 27 | 4.11 | | | |

The above table shows the emotional engagement of students concerning with their gender. The chi-square test was employed to explore whether cognitive engagement differs across ethnicity of the students. The chi-square test of independence showed that there was no significant association between gender and emotional engagement practice of the students, $x^2$ (18, $N$=88) = 0.18, $p$ >.01. Thus, we can say that there is no significant difference between genders of students in relation to emotional engagement of students. This means that gender of the students does not have influence over cognitive engagement.

*Table 9 Emotional Engagement practice across the Ethnic group*

| Ethnic group | N | Mean | Df | $x^2$-value | P-value |
|---|---|---|---|---|---|
| Brahmin and Chhetri | 47 | 3.95 | 36 | 21.39 | 0.97 |
| Janajati | 38 | 4.06 | | | |
| Dalit | 3 | 4.00 | | | |

The above table illustrates the students' emotional engagement with respect to ethnic group. The chi-square test was employed to explore whether emotional engagement differs across ethnicity of the students. The chi-square test of independence showed that there was no significant association between ethnicity and emotional engagement practice of the students, $x^2$ (36, $N$=88) = 0.97, $p$ >.01. The ethnic group of students does not make any significant difference in emotional engagement practice.

Table 10

Emotional Engagement practice across the Religion

| Religion | N | Mean | S.D. | $x^2$-value | P-value |
|---|---|---|---|---|---|
| Hindu | 65 | 4.01 | 54 | 54.25 | 0.47 |
| Buddhist | 15 | 4.05 | | | |
| Christian | 5 | 3.97 | | | |
| Others | 3 | 3.62 | | | |

The above table illustrates the students' emotional engagement with respect to religion. The chi-square test was employed to explore whether emotional engagement differs across religion of the students. The chi-square test of independence showed that there was no significant association between religion and emotional

engagement practice of the students, $x^2$ (36, $N$=88) = 0.47, $p$ >.01. The religion of students does not make any significant difference emotional engagement.

**Results and Discussions**

The study aimed to determine undergraduate students' engaged learning strategies on the behavioral, cognitive, and emotional engagement dimensions. The study's more precise goal is to determine how engaged learning practices on three dimensions relate to students' gender, ethnicity, and religion. There were 9 areas for students to practice behaviorally engaged learning, 13 sites for cognitive practice, and 8 spaces for emotional practice. The research revealed that students' behavioral involvement in chemistry was more effective than their cognitive and emotional engagement. According to Vygotsky (1978), the "zone of proximal development" relates to the level of comprehension that students can achieve when working engaged on a task. Being a part of, appreciating, or having a sense of importance at the school, as well as being grateful for accomplishments in school-related outcomes, are all components of identification with educational institutions (Christenson et al., 2012). Students' emotional engagement is measured by their level of positive and/or negative reactions to teachers, their peers, their time in class, and school in general (Devito, 2016). In order for pupils to become self-directed, lifelong learners, Vygotsky also believes that they should actively participate in their education, which is in line with engaged learning practice of the students.

The study finds no significant relationship between the behavioral engagement practices of students with their gender, ethnic group, and religion. Furthermore, no significant differences were found between students' cognitive engagement practice and gender, ethnic group, and religion. Similarly, there was no significant relationship between students' emotional engagement practice and gender, ethnic group, and religion. It was found that student engagement differs by gender (Sontam & Gabriel, 2012). The study of Jawthari and Stoffa (2022) also established the gender difference in student engagement in learning. It was determined whether the amount of time and energy invested in educational practices differed between students from different racial and ethnic groups (Greene et, al. 2008).

**Implications of the study**

When creating training and support programs for instructors, consideration had to be given to the various aspects of students' engagement. Such training and support initiatives will be helpful in increasing student engagement in chemistry classes, which will improve both teaching and learning in classrooms. The development of engaged learning practices in chemistry classrooms depends on science teachers engaging in appropriate professional development practices. To improve students' learning results, chemistry teachers must investigate and put into practice a variety of methods or dimensions of student engagement. The qualitative strategy along with quantitative strategy would provide variety of responses on modes of engaged learning practices. Student engagement. Therefore, mixed method research would be best to carry out to construct the in depth knowledge of students in engaged learning practice. The mixed-method research would be important to explore the ideas of engaged learning practices of the students. The study found that engaged learning practices do not depend on gender, ethnicity, and religion. Future research in this area can be conducted to see further reasons behind this.

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