The relationship between school climate, student engagement and academic achievement in higher secondary school

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Abstract

This study examined the relationship between higher secondary school students' perceptions of school climate, student engagement and academic achievement. The sample of 212 (108 girls, 104 boys) students from grade nine to twelve from one of the higher secondary schools in central Bhutan participated in this study. The descriptive statistics, Pearson correlation coefficient and mediation analysis using PROCESS in regression was used to analyzed the obtained data. The analysis of the data supported the theoretical conceptualization of the components of school climate and the domains of student engagement. The result revealed a significant correlation between the components of school climate and student engagement, and the domains of student engagement and academic achievement. Moreover, the analysis of the single mediation model indicated the student engagement to be significantly mediated the relationship between school climate and student academic achievement. Based on the findings from this study, implications for managing the school climate positively and enhancing the student engagement are elucidated in the paper.

Keywords: *academic achievement, school climate, student engagement, students*

Introduction

Over the past decades, many researchers, educators, psychologist and policymakers around the globe have increasingly recognized the importance of school climate and student engagement in the school (Thapa et al. 2013). There is a growing interest in school climate reform and visible appreciation as a data driven school improvement strategy that promotes safety, healthy relationships, school connectedness, engaged learning and teaching, dropout prevention and

school improvement efforts (Thapa, Cohen, & D'Alessandro, 2012). Moreover, the student engagement in the school as the key to addressing problems of low academic achievement, high levels of student boredom, alienation, and high dropout rates (Fredricks, Blumenfeld, & Paris, 2004). The student engagement in school is necessary to their academic achievement because of the co-productive nature of learning and contribution to overall achievement and moreover provides a lens for schools to measure how well the school is motivating the student energy, interest and self-regulation (Wylie & Hodgen, 2012; Gettinger & Walter, 2012; Reyes, et al., 2012). The general appeal of student engagement is underscored by high school reform efforts that explicitly address students' motivation to learn and engage with school (National Research Council & the Institute of Medicine [NRC and IoM], 2004).

Engaged students are more successful by any measures in the school (Wang & Holcombe, 2010). Student, who attend school regularly, adhere to the rules of the school and avoid disruptive behaviors, concentrate on learning and perform better on regular tests (Caraway et al., 2003; Finn & Rock, 1997). Moreover, the engaged students do more than attended and perform academically high (Chrietenson, Reschly, & Wylie, 2012).

On the contrary, students who are not engaged in the school are more passive learners and report being anxious, bored or even angry about being in the classroom (Li & Lerner, 2011;). They are also most likely to misbehave and engage into substance abuse (Li & Lerner, 2011; Patton, et al., 2006) and leaving the school without qualification thus, failing in life ahead for meaningful employment and further education opportunities (Rumberger & Rotermund, 2011; Cornell, Shukla, & Konold, 2016). The simlilar reason was also estbalished with Bhutanese student drop out, the lack of interest in school as one among the many other reasons was reported for student dropping out of school (Dorji, Dema, & Penjore, 2005). The decline of students' interest in the school and engagment has been attributed to a social developmental change that interacts with a new and more challenging secondary school climate (Eccles, 2008).The problem of decline in

academic motivation and enagement in school work is apparently noticed during middle and high school years (Wigfield et al., 2006). The noticebale worisome has come to the surface in news reported in Kuensel (2020, July 30) that, 210 high school students dropped out the school within the span of first six months in 2020. It was reported that, the lack of student engagement among many other factors were attributed to student dropping out of school, however, dropping out of school is not a new. The annual education statistics of 2019 (MoE, 2019) reported the declining drop out rate, but still, the drop out rate remains not negligible.

Anticipating to ehnached school climate, students engagement and learning infused with values of interconnected nature of reality and belongingness, there are exciting developments taking place in the educational system in Bhutan. Ministry of Education has launched a nation-wide reform initiative called Educating for Gross National Happiness (EGNH) in 2010 with the intended goal of embedding the Gross National Happiness (GNH) values and principles in the schools through a more holistic approach including extra-curricular programmes and curricular programmes (Ministry of Education [MoE], 2010; Sherab, 2013). Latter, the adoption of "Green Schools for Green Bhutan" emerged from the concept of 'Green schools' and through elaboration and promotion of its eight critical dimensions: environment greenery, intellectual greenery, academic greenery, social greenery, cultural greenery, spiritual greenery, aesthetic greenery and moral greenery (Powdyel 2014). These dimensions are now seen as a part of the school self-assessment tool.

The nationwide reform initiative of EGNH and Green School for Green Bhutan, one of the focus areas of EGNH, has anticipated in creating school atmosphere that provides respect, care, support, warmth, and delight in the school (Powdyel, 2010). These school atmospheres are achievable with the infused GNH principles and values in the school curriculum at all levels, and through conserving and learning from the environment that facilitate children to grow and develop "green" intellectually, spiritually, culturally, aesthetically, academically, morally, and socially (MoE, 2012).

The initiative of EGNH across schools in the country and emphasized for continuity in the Bhutan Education Blueprint 2014–2024: Rethinking Education has helped not only to rethink educational policies and programmes, but it has also expected to enhance the quality of education for children, especially the attainment of the nine learning attributes (Thinley, 2016).

As desired, EGNH initiative is reported to have contributed to improving the physical and educational ambiance of the schools and brought positive behavior changes in both teachers and students (MoE, 2014). However, there is still need of subsequent studies that substantially examine the desired outcomes of the initiative on the prominent features of our school system such as school climate, student engagement and academic achievement of the student. For example, Sherab (2013) suggests a series of case studies in schools to document exemplary EGNH practices; to determine salient features of EGNH, and its desired success in the school.

Although research eleshwere (e.g., Cohen & Geier, 2010; Wang & Holcombe, 2010; Eccles & Roeser, 2011; Thapa, Cohen, & D'Alessandro 2012) has recognized the impacts of distinctive culture of school climate on the students engagment and their academic achievement in the school, there is no clear studies in Bhutanese context that substaintally examined the relations among school climate, student engagement and students academic achivement. Moreover, based on the observers' recommendations on the existing climate of the school, engagement of the student, and the current academic learning score of the school where this study was conducted, this study was conducted to understand the students' perceptions of the current school climate that best support student engagement and academic achievement, further it explored the relations of school climate on engaging the students behaviorally, affectively and cognitively and their later influence on the students' academic achievement.

Objectives of the study

This study aimed to explore the relationship between school climate, student engagement and academic achievement of higher secondary school.

Main research question

What is the relationship between school climate, student engagement and academic achievement of higher secondary school?

Sub-questions

1. How do students' perceptions of current school climate components correlate with student engagement?
2. How do student engagement influence their academic achievement?
3. How significant is the school climate a predictor of student academic achievement?
4. Does student engagement mediate the relationship between student perceived school climate and their academic achievement?

Literature review

In this section, the review on the conceptualization of the school climate and student engagement, the relations between school climate and student engagement and their influences on the students' academic achievement were presented.

School Climate

School climate has a profound impact on students' mental and physical wellbeing (Thapa et al., 2012). However, there is still little consensus about which dimensions are essential in measuring school climate validly and often being used to encompass variant aspect of school environment (Thapa et al., 2013). The review of literature on the aspects of school climate by Wang and Degol (2015) categorized school climate into four dimensions: (a) structure of learning- which

focuses on the overall quality of the academic learning, including curricula, instruction, teacher training, and professional development; (b) student-teacher relationships which stresses the quality of interpersonal relationships within the school (student and teacher, among students); (c) Safety- represents the degree of social, physical and emotional wellbeing provided by the school, and the presence of effective, consistent, and fair disciplinary practices; and (d) physical environment refers to a school's physical layout, geographic surroundings, and the internal and external resources available to support the school. These four dimensions of school climate, which is also called school climate components directly affect different dimensions of engagement in separate and dynamic ways (Ortega, et al., 2011; (Wang & Eccles, 2013) and it has direct relations to high school students' academic achievement (Stewart, 2008).

As school reform initiatives around the globe explicitly focus on improving academic and social climate as a prelude to enhancing student academic and psychological wellbeing (Durlak et al. 2011), the malleability of school climate has become target for intervention to understand the students' experiences of school life and to frame interventions subsequently (Maxwell et al., 2017; Wang & Degol, 2015). A critical goal for effective school reform is to identify features of the school climate that can be altered to improve student psychological wellbeing, engagement, and their academic achievement. As desired, MoE has initiated many exciting reform initiatives, launched of EGNH, Piloted School Autonomy School, Reform Programme and establishment of Central School, and Bhutan Education Blueprint 2014-2024, to mention a few. Moreover, under its department and division has developed a series of policy framework and guidelines towards promoting the learning environment and students' psychosocial wellbeing at school such as Curriculum Framework for School Guidance and Career Education, and Educating for Gross National Happiness: Refining Our School Practices, Guidelines for School Discipline Policy, A Guide to School Self-Assessment Tool and School Improvement Plan.

The initiation of these milestone have given impetus to the recognition of the importance to spiritual, environmental, social, and emotional wellbeing as integral to learning (Jamtsho, 2015), and some change and progress were noticed on enhancing school climate, learning atmosphere, students' behaviour, and teachers' moral ethics since the implementation of the initiative (MoE, 2012). While the momentum and progress were noticed as an outcome of the MoE initiative, subsequent to it, little is known about how this enhanced school climate has relationship with student engagement and leads to other distal outcomes of interest, such as academic achievement.

Student engagement

From the two decades to the recent studies on the student engagement, the theoretical and research literatures on student engagement generally reveal little consensus about definitions and contain substantial variations in how engagement is conceptualized and measured (Lam et al., 2014). However, the current study conceptualized the construct by Fredricks, Blumenfeld, and Paris (2004) that defined engagement as the multidimensional construct composed of three components: behaviour, affective and cognitive. Behavioral engagement refers to the practices that draw the idea of participation; it includes involvement in academic and social or extracurricular activities and is considered crucial for achieving positive academic outcomes. Emotional engagement covers both positive and negative affective reactions (e.g., interest, boredom, anxiety, and frustration) to activities, as well as to the individuals with whom one carries out the activities (teachers, peers). It also comprises identification and belonging to school. Cognitive engagement means willingness to apply the mental effort and the use of self-regulatory and other approaches to learning. These three components are dynamically interrelated within individuals and provide a rich characterization of how students feel, think and act (Wang & Peck, 2013). Research indicates that student engagement is also self-reinforcing, engaged students will demonstrate facets of each dimension (Appleton et al., 2008). Highly engaged students can be characterized as being interested in learning, relatedness with school, involved in

a variety of school curricular and extra-curricular activities, interconnected and belongingness with school, and generally well behaved (Fredericks et al., 2004).

Although research literatures has evidence that student engagement and its components are potential predictor and mediator between the school climate and desired learning outcome across academic, social, and emotional domains (Christenson & Reschly & 2012; Lawson & Masyn, 2015; Wang & Eccles, 2013), it is critical to understand the potential factors of student engagement as broadly put into two types by Skinner and Pitzer (2012), personal factors and social factor. They defined, personal factors are students' self-perceptions or self-system processes which refer to durable assessments of multiple features of the self, such as self-efficacy or a sense of belongingness in school, social factors, also referred to as social contexts are supportive interpersonal relationships with teacher, adult and peer, and include their quality and nature, such as whether they are warm, dependable, or controlling. Previous studies have found out that student perceptions of their school climate are associated with their engagement (Wang & Eccles, 2013). From the disadvantage urban school sample, they have observed several aspects of school climate were related to student engagement in the school. Particularly, they highlighted the need for schools with aspects of emotionally supportive and caring school environment to influence student engagement. Similarly, other personal factors include socioeconomic status, indigenous status, speaking a language other than English at home, the number of work hours outside school and family structure (Gemici & Lu, 2014). The social factors such as supportive student-teacher relationships and safe learning environment was found to have significant relation with student emotional engagement (Bryk and Schneider 2002; Wang & Eccles, 2013).

Earlier studies have shown that students who have high levels of engagement have better grades and conduct at school, as well as higher levels of self-esteem and socially appropriate behaviors (Fredricks et al., 2016). As a result, the emphasis of educational system around the globe at present has been placed on student engagement in the school (Dotterer & Lowe, 2011; Reyes, et al., 2012)

along with the school climate, that is regarded as a system of school characteristics that influence both student engagement and their academic achievement (Wang & Eccles, 2013; Cornell & Huang, 2018**).**

Alike elsewhere, MoE commitment in promoting the positive learning environment, achieving quality and equity education, health and wellbeing, cultural diversity, and traditional knowledge and shared responsibility, aspiration for students learning, student engagement through values infused extra-curricular programmes, to mention a few, resonate in educational policies and programmes and it is also evident in Bhutan Education Blueprint 2014–2024: Rethinking Education. However, having all these educational policies and programmes, it is vital to study the how the system of school characteristics interact each other towards achieving its desired outcomes, as it guides school authorities to gauge the impact of their school environment influences on the desired outcomes and frame intervention accordingly (Konold et al., 2018).

School climate and student engagement

While numerous studies elsewhere (eg., Eccles & Roeser, 2011; Thapa, Cohen, & D'Alessandro, 2012; Wang & Eccles, 2013) has recognized the distinctive climate of school impacts the students engagment and learning in the school, it is also vital to understant the degree to which students perceived school climate and its contextual factors meets those psychological needs to determines the level of students' engagement in school (Wang & Holcombe, 2010).

Based on the existing research literatures from Thapa, Cohen, and D'Alessandro (2012); Wang and Degol (2016) and from context of the study, we have focus on for facets of school climate: student–teacher interpersonal relationship, structure of learning, school safety and physical environment. For example, supportive atmosphere as a result of student interpersonal relationship with teachers and peers were perceived to facilitating students' identification with the school group, as well as positive feelings and behaviors regarding the school's prevailing norms and values, which together promote student engagement (Fatou

& Kubiszewski, 2018). Wang and Holcombe's (2010), longitudinal study on effects of school climate on student engagement found teacher social support to be most strongly linked with student's emotional engagement for middle school students. Similarly, Gauley (2017) found supportive relationships with adults were significantly associated with a middle school student's emotional, but not cognitive school engagement.

The safe school physical environment, free of bullying, and opportunities for students to actively participate in their own learning are commonly associated with elevated levels of student attachment and engagement in school (Wang and Eccles 2012). Gauley (2017) using regression analysis and mediation tests to study effects of the school climate on school engagement showed that, student's sense of feeling safe was directly associated with their level of their emotional engagement. The students' perceived quality of instruction was also found to enhance the student engagement at a given school (Dotterer & Lowe, 2011). The quality of instruction through which teachers make use of structuring and scaffolding strategies during their lessons is more likely to enhance their student engagement with school. The use of these learning structure is potentially reflective of teachers' active interest in their students' academic performance, which in turn motivate students to become more behaviorally engaged in their school work (Gemici & Lu, 2014).

There are also outside school factors that influence the student engagement in the school. For instance, gender and student's socioeconomic status factors such as income, race, however, the socioeconomic factors were found to be having less impact on student engagement as compared to school climate. When coming to gender as a factor for student engagement, male students were found to be more emotionally engaged than females, but less cognitively engaged (Wang et al., 2013).

The student engagement as a desired outcome of school climate and facilitating the valuable link between school climate and student academic outcome

(Fredricks, Filsecker, & Lawson, 2016), school climate restructuring and reform initiatives is vital through effective strategies. Democratic school and place-based education are two strategies and mostly implemented and successful (Thapa et al., 2013).

In keeping pace with educational reforms, the MoE initiated various reform initiatives, to mention few, New Approach to Primary Education (NAPE) in 1990s to recent EGNH, piloted school, and school reform program and establishment of central school. These initiatives have served unnoticeably as an effective strategy among many in managing the school climate and promoting students' wellbeing and student engagement in the school. Through these initiatives, it is anticipated to have influenced the components of school climate and promoted the student engagement and academic achievement. The substantial literature appeared from the case study by Lhendup et al. (2018) learned that GNH values teach students the skills for wellbeing, positive emotion, a supportive relationship, and purposeful engagement in the school. They also found that, GNH values such as, 'sense of responsibility' helped students to become more responsible in completing their academic tasks on time, that further contributed to improved academic achievement.

Student engagement and academic achievement

Student engagement has long been recognized as one of the important factors in student learning and academic achievement (Lei et al., 2018; Fredricks et al, 2016; Lawson & Masyn, 2015), and high student engagement is consistently associated to academic outcomes such as course grades and achievement test scores (Fredricks et al., 2016). It was also found to be positively mediating between school climate and student academic achievement (Dotterer & Lowe, 2011; Konold et al., 2018).

Many research literatures has reported the positive correlation between the dimensions of engagement and academic achivement. At the sametime, variation of magnitude of each dimension of engagment on academic achievment were also

reported in many studies. For instance, a meta analysis study by Lei et al. (2018) on relationships between student engagement and academic achievement have reported the highest average effect size between behavioral engagement and academic achievement, followed by the effect size for cognitive engagement, with emotional engagement being the lowest. A study by Patrick et al. (2007) examined relationships among classroom social environment, engagement, and achievement among early adolescents and found that, classroom climate was positively related to cognitive and behavioral engagement, in turn, behavioral engagement positively influenced the student math grade. Similar finding was observed in the study by King (2015) and concluded that academic achievement was positively correlated with behavioral and emotional engagement. Further, the evidence of effect size variation was found in a short longitudinal study by Wang and Holcombe (2010). Their study found that school climate was positively correlated with all dimensions of engagement, in turn, emotional engagement was significantly found to be correlated to student academic achievement as compared to other two dimensions. These studies provide how the school climate directly or indirectly predict the student academic achievement through influencing the student engagement. It also draws the mediating role of student engagement between school climate and student academic achievement.

However, other studies (eg., Appleton et al., 2006; Chen et al., 2013; Shernoff & Schmidt, 2008; Shernoff, 2010) did not reach to similar conclusion and in some studies researchers have not even found any significant correlation between student engagement and academic achievement. This inconsistency relationship between the domains of student engagement and academic achievement seek more studies in different context.

Method

This study employed a quantitative research method using survey research design. The quantitative analysis of nationally representative data sets, regional data sets, or local data sets where school climate surveys are given, provide a understanding

of the relations of school climate influencing student engagement and academic achievement of the schools (Davis & Warne, 2015). The survey research design often based on survey questionnaire are relatively unbiased representation of population and responses, have uniqueness since information gathered is not available from other sources (Owens, 2002). Moreover, using survey research design in this study will avoid the social desirability bias (Nancarrow & Brace, 2000) while participants respond to the questionnaire.

Participants

Participant for the study were 212 (108 girls and 104 boys) students of grade 9th to 12th studying in one of the higher secondary schools in central Bhutan. The sample consist of 50.9% girls and 49.1% boys. The majority participants were from grade 11th to 12th (52.8%) as compared to grade 9th to 10th (47.2%). The sample is broadly representative of different socioeconomic levels, parent's education background and the mixed-ability. In this study, only students were surveyed as they were consulted as "knower" in this process, and as valuable informants of when they are truly engaged, and of what they deem as conditions influencing their engagement (Bishop & Pflaum, 2004). The participant sampling from each class were done using formula to have fair samples from each class. ($n_Y = N / (1 + Ne^2)$ where N = population size, and e = alpha level, i.e. e = 0.05.

Instruments

Participants completed the two sets of self-report survey questionnaire that were adapted from the relevant literatures. A survey questionnaire on student engagement in the school was adapted from Lam et al. (2014), and this adapted questionnaire items on the student engagement have shown to be both reliable and valid in prior research conducted in 12 countries (Lam, et al., 2014). A questionnaire for school climate survey was adapted from La Sall et al. (2018) and have clear coverage on all dimensions of school climate. The variables that measured the school climate and student engagement were rated on five point-scales (one to five) with one being the lowest score and five being the highest with

three as neutral. The five-point scale was used, as it is readily comprehensible to respondents and increase the response rate (Devlin et al., 1993; Hayes, 1992). The data for academic achievement were obtained from their recent examination result in percentage. The adapted questionnaires were submitted to three subject experts for content validation and contextual appropriateness and applicability. Upon suggestions from the expert, the items were further simplified and some inappropriate items to our context were excluded. The reliability of both the instrument was established through pilot test involving 80 participants from the focused school. The internal consistency of alpha .935 was obtained indicating the items were valid for implementation.

Procedure

The student participants were recruited based on their consent and with the approval from the head of the school and their parents. Prior to the survey, the participants were briefed on maintaining confidential of their responses and safe storage of data obtained from them. They have completed the two set of self-reported survey questionnaires after the end of their annual examination. Questionnaire items were also explained in *Dzongkha* during the survey time to avoid discrepancy between intended measure of the items and participants understanding of it.

Data Analysis

The data obtained were all analyzed using SPSS (version 22.0). Descriptive statistics such as mean and standard deviation were first calculated for the components of both school climate and student engagement. Pearson correlation coefficient was then computed to examine the correlation between the components of school climate on student engagement, and domains of engagement on academic achievement. Mediation analysis using PROCESS in regression was conducted to examine the relations between school climate and student academic achievement mediated by student engagement. The bootstrapping coefficient interval was used to examine the mediation effect and its statistical significance as

it has received the standard recommendation for this test (Preacher & Hayes, 2004).

Results

The perceived school climate

The descriptive analysis on the current school climate components perceived by the participants is presented in Table 1. The student perceptions on student-teacher relationship (M = 21.34, SD = 4.77) appears to be on higher side as compared to other components. The findings show that, of the four components of school climate, student exhibit much higher perception that they have good relationship with their teacher - followed by structure of learning (M = 20.10, SD = 5.06), school safety (M = 14.60, SD = 3.44) and physical environment (M =13.08, SD =3.70).

Table 1. Descriptive statistics for the student perception of components of school climate

Domain	N	Min.	Max.	Mean	Std. Deviation
Student-teacher relationship	212	6.00	30.00	21.34	4.77
Structure of Learning	212	6.00	29.00	20.10	5.06
School Safety	212	4.00	20.00	14.60	3.44
Physical Environment	212	4.00	20.00	13.08	3.70

Student engagement variation

Table 2 presents the student perceptions of their engagement across three domains of engagement in the school. The examination of their means across the congnitive engagement had significantly higher mean (M = 43.39, SD = 9.07) while compared to behavioural engagement (M = 41.33, SD = 7.20) and emotional engagement (M = 31.70, SD = 6.32). The student perceptions in releation to

emotional engagement was found be significantly low as compared to other domains of engagement.

Table 2. Descriptive statistics for student engagement

Domain	N	Min.	Max.	Mean	Std. Deviation
Emotional Engagement	212	13.00	45.00	31.70	6.32
Behavioral Engagement	212	12.00	60.00	41.33	7.20
Cognitive Engagement	212	12.00	60.00	43.39	9.07

Correlation between school climate and student engagement

One of the main questions of this study was to examine the relationship between their perceptions of their current school climate and student engagement. The correlation analysis illustrated in Table 2, showed a significant correlation between the overall school climate and the student engagement ($r = .595$, $r^2 = .354$, $p < 0.01$). Although there was a significant relationship between the variables, it is important to note that the correlation coefficient was not too high but r^2 value (.354) shows that the school climate components has correlation with student engagement, and explain 35.4% of the variance in student engagement.

The correlational analysis between student perceptions of the components of school climate and student engagement showed that the physical environment ($r = 0.392$, $r^2 = 0.281$, $p< 0.01$) had significantly higher correlation with student engagement while compared to school safety ($r = 0.529$, $r^2 = 0.278$, $p < 0.01$), student - teacher relationship ($r = 0.485$, $r^2 = 0.235$, $p < 0.01$), structure of learning ($r = 0.443$, $r^2 = 0.196$, $p < 0.01$). The least correlation was found between the student perceptions of structure of learning and student engagement.

Table 3. Correlation between school climate components and student engagement

	1	2	3	4	5	6	7
1. School Climate Total	-	.813**	.855**	.781**	.817**	.751**	.595**
2. Student-teacher Connection		-	.658**	.624**	.547**	.428**	.485**
3. Structure of Learning			-	.622**	.656**	.476**	.443**
4. School Safety				-	.554**	.443**	.529**
5. Physical Environment					-	.581**	.392**
6. Student Engagement							-

**. Correlation is significant at the 0.01 level (2-tailed).

Correlation between student engagement and academic achievement

Table 4 indicate the correlation analysis between the domains of student engagement and academic achievement. The correlation of emotional engagement was significant with academic acheivement ($r = .182$, $r^2 = 0.033$, $p< 0.01$), similarly with the cognitive engagement and academic achievement ($r = 0.155$, $r^2 = 0.024$, $p< 0.05$) at confidence interval of 95%. However, no significant correlation was observed between the behavioral engagement and academic achievement.

Table 4. Correlation between student engagement components and academic achievement

	1	2	3	4
1. Emotional engagement	-	.583**	.493**	.182**
2. Behavioral engagement		-	.674**	.080
3. Cognitive engagement			-	.155*
4. Academic achievement				-

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

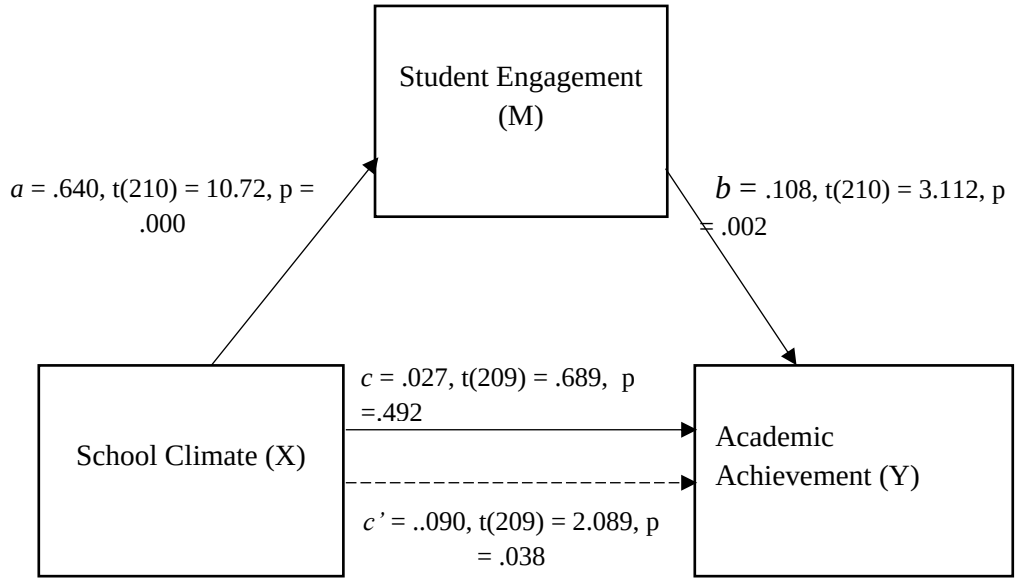
Relationship between school climate and academic achievement mediated by student engagement

Mediation analysis using PROCESS macro for SPSS 22 was run to explore the student engagement mediating the relation between perceptions of school climate and academic achievement. Figure 1 shows the relation of school climate (X) with academic achievement (Y) was mediated by student engagement (M).

In the mediational model using regression as presented in Figure 1, the regression on student perceptions of school climate significantly associated with student engagement, $b = .64$, $t(210) = 10.72$, $p = .000$. The R^2 value show that school climate explains 35.4% of the variance in the student engagement, and the fact positive value of b shows that the relationship is positively significant. The student engagement for academic achievement in presence of school climate was found to be significant, $b = .108$, $t(210) = 3.112$, $p = .002$. The R^2 value of 0.44, which explain 44.1% variance in the academic achievement by the student engagement. However, the school climate was not significant predictor of academic achievement after controlling the mediator, student engagement, $b = .027$, $t(209) = .689$, $p = .492$ and misses the statistical significance of $p < .05$ with the 95% confidence resides somewhere between -.0515 and . 1069. The analysis

of the regression of academic achievement predicted by the student perceptions of school climate in presence of student engagement revealed significant relation, b = .090, t(209) = 2.089, p = .038.

Fig 1. Standardized regression coefficients for the relationship between school climate and academic achievement mediated by student engagement. $p < 0.05$.



The most relevant to the mediation hypothesis was the estimate of the indirect effect of school climate (x) on (academic achievement (y) via student engagement (m) (Hayes, 2009). To examine the mediational role of student engagement on the school climate and academic achievement, the indirect effect of school climate on the academic achievement via student engagement was tested using a percentile bootstrap estimation implemented with the PROCESS macro (version 3.4) with 5,000 bootstrap. If the bootstrap-confidence interval (CI) for the product of school climate and student engagement does not include zero or integrate different sign, it will provide evidence of a significant indirect effect of school climate on academic achievement through student engagement, thus having mediational role (Preacher & Hayes, 2008; Hayes, 2009). The results indicated an indirect coefficient, b = .018, SE = .032, 95% CI [-.075, -.015,] with the confidence interval integrating same sign. The result showed that, there was

significant indirect effect of school climate on academic achievement via student engagement, thus, it is concluded that there is compelling evidence of mediation effect of student engagement between school climate and student engagement.

Discussion

The findings of this study corroborated the theoretical conceptualization of the components of school climate, domains of student engagement and student academic achievement. The correlational analysis shows the positive correlation between the student perceptions of school climate and student engagement, and between the domains of student engagement and academic achievement. Single mediation model in regression analysis indicates the student engagement positively mediated the relationship between the school climate and academic achievement of the student.

Although contextually different, the correlational analysis of the study supports the past studies in revealing the positive correlation between the high school student perceptions of their school climate and student engagement in the school (Eccles & Roeser, 2011; Wang & Eccles, 2013, Wang & Holcombe, 2010), and between the high school student engagement and their academic achievement (Lei et al., 2018; Fredricks et al, 2016; Lawson & Masyn, 2015).

The result of the study showed a significant correlation between the all the components of school climate and student engagement. However, when analyzing the correlation between each component of school climate and student engagement, of the three components of school climate, physical environment was appeared to be significantly higher in correlation with student engagement compared to other components - school safety, student - teacher relationship and structure of learning. This finding was consistent with findings of earlier studies by Wang and Degol (2015); Wang and Eccles (2012); Wang and Holcombe, (2010) that, safe physical environment, free of bullying, and supportive student and teacher relationship elevated the levels of student attachment and engagement in school. Despite the studies in different contexts, the consistency of this study

finding with past studies could be of the common psychological aspects of the student attributed by the safe physical environment, supportive student and teacher relationship and school safety. For instance, safe physical environment and supportive student and teacher relationship maintains the students' emotion, safe and secure in learning activities and thereby instilling high engagement in the school (Gemici & Lu, 2014; Gauley, 2017). The other plausible reason for indicating significant correlation between the components of school climate and student engagement in the present study context could be enhanced emotional wellbeing and engagement (both curricular and extra-curricular activities) through MoE initiative of EGNH and through green school initiative across the schools anticipating in creating school atmosphere that provides respect, care, support, warmth, and delight in the school (Powdyel, 2010). It is indicative that, this possible reason for this finding of the study is revealing the impact of EGNH and green school initiative in the school. Earlier it was also reported to have contributed towards improving the physical and educational ambiance of the schools and brought positive behavior changes in both teachers and students (MoE, 2014).

Although there are numerous researches on the relationship between the dimensions of school climate and the student engagement, the results so far have found to be inconsistent (Lei et al., 2018). For instance, the academic achievement was positively correlated with behavioral and emotional engagement (King (2015); with cognitive and behavioural engagement (Patrick et al., 2007); with only behavioral engagement (Lei et al., 2018), and only emotional engagement (Wang & Holcombe, 2010). The other studies (eg., Appleton et al., 2006; Chen et al., 2013; Shernoff & Schmidt, 2008; Shernoff, 2010) did not have even found any significant correlation between student engagement and academic achievement. Taken together, the findings in these studies indicate that different domains of student engagement have differing correlations with academic achievement. Similarly, the finding of this study is inconsistent with the findings of earlier studies. The study revealed that, academic achievement was significantly correlated with emotional engagement and cognitive engagement (see Table 4). The indicated higher mean

(M = 21.34, SD = 4.77) for the student and teacher relationship had possibly influenced the student academic performance. For instance, the supportive relationship from teacher can enable students to share their personal problems to teachers without fear; this in turn will help teachers to respond appropriately to students with timely counselling and support that are crucial for improving students' academic performance. Other plausible contextual reason for the positive correlation could be due to enhanced wellbeing of students through the implementation of EGNH that promotes the GNH values such as, 'sense of responsibility' that helped students to become more responsible in completing their academic task that further contributed to their academic achievement (Lhendup et al., 2018). It is surprising to note that, the relationship between student behavioral engagement and academic achievement was not significant. On other hand, the indicated mean for student perceptions of behavioral engagement (M = 41.33, SD =7.20) was not at the least compared to other dimensions of student engagement. A possible explanation for this result could be that students who get poor grades do not have a good foundation of skills that help them learn, so they have difficulty getting good grades even when they attempt to engage more in behavioral engagement.

For the main proposition of this study, single mediation model was tested for relationship between student perceptions of school climate and student academic achievement mediated by student engagement. The tested model indicates the significant direct effect of the school climate on the student engagement. Similarly, the significant direct effect of the student engagement on student academic achievement was observed. After controlling the student engagement, there was no significant effect of school climate on the academic achievement. Interestingly, there was significant indirect effect observed for school climate on the student academic achievement through student engagement. This indicate that there is mediation effect of student engagement between school climate and student academic achievement. This findings are substantially consistent with previous studies focused on intermediary role of student

engagement in relationship between the student perceptions of school climate and their academic achievement (Dotterer & Lowe, 2011; Konold et al., 2018; Wang & Holcombe, 2010). The plausible reason for this findings could be due to having supportive student and teacher relationship, and having quality learning structure as indicated in higher mean (see Table 1). The supportive relationship with teacher creates positive emotional climate for learning and demonstrate that the classroom is a safe and valuable place of learning (P. A. Jennings & Greenberg, 2009). As a result, students feel more connected and engaged in learning, and become more successful academically. Similarly, the quality of instruction through which teachers make use of structuring and scaffolding strategies during their lessons is more likely to enhance their student engagement and become more behaviorally engaged in their academic task (Gemici & Lu, 2014).

Implications and conclusion

The current study examining the relationship between the student perceptions of school climate, student engagement and academic achievement of higher secondary school will help teachers to better understand the students' school experiences and their engagement in the school. It will also provide direction for teacher in striving for positive school climate that promote the student engagement and academic achievement. The following implications are discussed based on the findings of the study.

First, finding from this study indicate relatively low level of student perceptions of the physical environment of the school, and student engaged least in the emotional engagement. This relatively low perceptions of the school physical environment and their low involvement in the emotional engagement will adversely affect the student engagement in other domains of engagement and their academic subsequently. Therefore, it is important for the head of the school and teachers to understand the existing climate of the school to develop the physical environment of the school that promote students' emotional wellbeing and student engagement across the domains of engagement.

Second, the correlation between the structure for learning and student engagement was observed least as compared to other components of the school climate. This indicates teacher lacking the efforts in providing the quality teaching and learning experiences to students. Student perceived that the quality of structure of learning at given school enhance their behavioral engagement. Students who are competent but either alienated from school or less intrinsically motivated may need more support in the form of more interesting and relevant activities in order to become engaged with learning. On the other hand, students who are passive about attempting academic tasks may need more structured and scaffolding, more guidance, and more clear instruction in teaching. Thus, teacher to be proactive and resourceful in providing quality structure of learning and scaffolding of task to the students. Moreover, this finding recommends to school to frequently conduct professional development course for teachers to keep them practically rich in providing quality teaching and learning experiences to the students.

Third, the correlation between student behavior engagement and academic achievement was found not significant. This result indicates low level of student engagement in activities that includes both curricular and extra-curricular activities in the school. When students who get poor grades do not have a good foundation of skills that help them learn, it will be difficult for them to get good grades even when they attempt to engage more in behavioral engagement. As some researchers have found the positive correlation between behavioral engagement and academic achievement (Furrer & Skinner, 2003). Moreover, students are likely to participate in school and bond with school when teachers create a caring and socially supportive environment, because such school contexts meet students' needs for relatedness. Therefore, it is important for school to create a caring and socially supportive environment, and conduct both curricular and extra-curricular activities to keep the students behaviorally engaged. At the same time, student should also actively participate in learning activities to keep them behaviorally engaged in the school.

Fourth, the student engagement has positively mediated the relationship between school climate and student academic achievement. It was also observed that, the student engagement is consistently associated to higher academic outcomes. Research has shown that student engagement is dynamically interrelated to school climate and student academic achievement (Fredricks, Filsecker, & Lawson, 2016). However, the school without appropriate and separate tools to monitor the school climate and student engagement, as a result, their influences and association with the student academic achievement may not be appreciated in school reform decision making. Therefore, it is important for school to monitor and keep the timely documentation on events happening in the school, so that later decision making and intervention program for the school climate and student engagement will be data driven one.

Limitations

The current study has several limitations. Firstly, the data for this study was mainly rely upon the self-reported information from the students on their school climate and engagement in the school. Their response to questionnaire may be influenced by their individual behavior or as socially desired. Thus, this limitation seeks multiple sources of data in future research to establish the validity of the study. Secondly, the student perception on school climate and their engagement in the school might be affected by others unobserved factors, the limitation of exogenous variables suggest future studies to examining the relationship with unobserved variables through empirical and longitudinal studies. Thirdly, the study did not examine the mediation role of each domain of the student engagement on the relations between school climate and academic achievement score of the students. The mediational result will be interesting if the future studies could examine the mediation role of each domain of student engagement on the relations between school climate and academic achievement. The context of this study was in one of the higher secondary schools in central Bhutan, therefore, findings are limited only to the school recruited in this study and generalizing the findings to rest of the schools in Bhutan may not be appropriate.

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