Original Research Article

Ecology of schooling: Enabling school environment for student engagement in Uganda's Universal Secondary Education

**Sylivia Awori[1],
*Denis Sekiwu[2] ,
Frederick Ssempala[2]
and
Naluwemba Frances[4]**

[1]Faculty of Science and Education, Busitema University,Uganda.
[2]Faculty of Education, Kabale University, Uganda.
[3]Faculty of Education, Kyambogo University, Uganda.

*Corresponding Author
Email: dsekiwu@kab.ac.ug

Using the Mixed method, we examine the relationship between the school environment and student engagement in USE schools in Uganda. Most study participants agree that the environment in USE schools is generally conducive. There isa positive relationship between the school environment and student engagement although this relationship is still low. This means that student engagement in school activities cannot depend on only the school environment. There are a host of other factors that influence student engagement which the school authority needs to know and utilize in order to improve student engagement. Management of USE schools should provide for counseling and guidance services as well as supporting the integration of values in schools. The Government should construct good libraries and provideup-to-date learning materials like textbooks plus any other reading materials. Government shouldalsorecruit experienced and quality teachers into the USE schools, as well as constructing modern science laboratories to support the teaching of science disciplines.

Keywords: School environment, student engagement, schooling, universal secondary schools

INTRODUCTION

The school environment refers to the physical, academic and social activities of a school (Reynolds et al., 2017). The school environment provides a climate that enables student growth and development (Birch and Ladd, 1997; Riddell, 1988 &1989). The school environment should promote school relationships that prevent chronic absenteeism and dropout (Dynarski et al., 2008). The school is an essential placeto provide psychological comfort and a sense of belonging to students and teachers (Elias and Haynes, 2008; London et al., 2007; Cooper, 2014; Yazzie-Mintz and McCormick, 2012).

In Uganda, schools have long been at the centre of academic, behavioral and emotional engagement of students (Tumushabe and Arinaitwe, 2013).The Universal Secondary School (USE) environment, for example,provides student academic growth through continuous (i.e. tests and assignments) and summative assessments (end-of-terms examinations).Another example is the Uganda National Examinations Board (UNEB) mandated by government to assess students' cognitive competencies in the country (Nsubuga, 2008). As a measure to improve academic engagement in science disciplines, in 2006 government

introduced the Secondary School Science and Mathematics Teachers (SESEMAT) aimed at boosting competencies of science teachers (Komakech and Osuu, 2014). SESEMAT is a three-year project made possible through partnership between Uganda government and Japan International Cooperation Agency (JICA). Every USEschool uses a student code of conduct andadministers disciplinary controlsfor student behavioural engagement (Sekiwu, 2013). Finally, USE schools have senior teachers to conduct counselling and guidance sessions as a way of engaging students emotionally (Otwine et al., 2018). Mugagga et al. (2016) argue that the emotional aspect of the learner is partly tamed by integrating global citizenship values in the secondary school curriculum.

Much as there are interventions to support student engagement in USE schools in Uganda, the environment in most schools continues to be hostile for sound student engagement to occur.Sound student engagement would refer to high level of academic, behavioral and emotional engagement of students in the affairs of the school. This would eventually improve their performance as well as enable them become good citizens. Nsubuga (2008) observes that student academic engagement in sciences remains poor in USE schools countrywide because of poor leadership styles. From 2015 to 2018[1], the Eastern region of Ugandacontinues to register the poorest performance (UNEB, 2018).Students in USE schoolshighly fail because of inadequate academic facilities like libraries and textbooks as well aswell-stocked science laboratories. There also many student indiscipline cases occurring in USE schools and some of these include bullying, chronic absenteeism, drug abuse and students flogging teachers.

This study examineshow the school environment influencesstudent engagement in USE schools.The study assesses the conduciveness of the USE environment in terms of academic, emotional and behavioral growth of learners. The study was conducted in Tororo districtin Eastern Uganda. Eastern Uganda has, for the last five years (2015-2018), been ranked as the worst academically performing region both at the Uganda Certificate of Education (UCE) and Uganda Advanced Certificate of Education (UACE) examinations (UNEB, 2018).

Literature and Theoretical Framework

A growing body of literature demonstrates the environment of schooling as significantly promoting student learning and growth. Huylebroeck and Kristof (2015) argue that in2007, the government of Uganda introduced the USE programto support economically vulnerable families and communities to be able to access secondary education.Similarly, UNESCO (2016) points out that many vulnerable societies need to access education so as to encounter human growth challenges and to enable

learners fit in vast life experiences.This view builds on that of Jones et al. (2007)who argues that a good school environment provides students with the necessary learning and acculturation that motivates students to grow morally, intellectually and emotionally. This is a further extension into the work of Bristor and West (1996).They argue thatconducive school is traditionally an environment of teacher-directed learning where students may be required to master content, pass examinations and complete assigned tasks. However, much more must occur to be able to apply learning to life situations.This rendition is further articulated by Jones et al. (2008) who argue that a goodschool environment should deliver an enablement that motivates students to meet their dreams beyond teaching them to pass examinations.This school environment should engage students in experiences that enable them meet the holistic goals of schooling which include learning to know, learning to do, learning to think and learning to innovate.

Walker and Greene (2009) say that there is an interconnectivity between the school environment and student engagement.Their argument is related to that of Finn and Zimmer (2012) who observe that teachers in US high schools attribute rampant school dropouts to premature student engagement at school and with learning.Cornelius et al. (2004) remark that the poor school environment may lead to high student and teacher attrition rates. However, Bucholz and Sheffler(2009) refute the earlier argument that the school climate and culture influence student engagement. Although a large amount of a child's time is spent in school trying tolearn various skills deemed necessary to propel them in the global society, the school could also be the same place where the student develops bad behavior, receives bad company of peers and engages in negative indoctrination. The ecological understanding of schooling is not always about the creation of school climates that genuinely engage and support all students toachieve positively. Schooling should also enable us understand that hostile cultures can be developed in schools and can lead to low student engagement.

A good school environment is one that seeks to promote positive training and learning. Being such an important place in childhood growth and development, the school is an important place for providing an understanding of the ways in which to improve student engagementand maximizing effectiveness in child education (Wawrzynski et al., 2014). Researching on online learning and long-distance education, Lyimo et al. (2017) comment that if schools are to play a huge role of educating the next generation on how to be successful members of society, then every precaution should be taken to make sure that the school environment is one that helps students thrive other than one that fails them. According to the Ministry of Education and Sports (MoES) report(2013), in Uganda some USE schools do not have adequate libraries, classrooms are congested and full of dust, instructional materials are inadequate and these schools lack enough textbooks. This kind of environment, according to Finn and Zimmer (2012), tempts teachers

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[1] We have not included UNEB results for 2019. These results were not yet out by the time of releasing this publication.
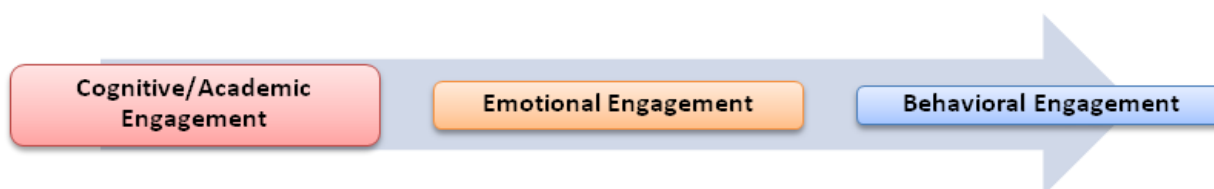
Figure 1: Showing the school environment as students' academic, emotional and behavioural engagement process

and students in USE schools to abandon teaching and learning.

Elias and Haynes (2008) as well as London et al. (2007) say that if educators do not improve school conditions, the same schools can stiflestudents' creativity and growth. Cornelius et al. (2004) argue that those challenging experiences that may stifle school progress could be classified in the cognitive, emotional and behavioural domains. Cognitively, poor academic performance cripples school quality (Nsubuga, 2008; Sinclair et al., 2003). Behaviorally, student indiscipline waters down the school values (Sekiwu, 2013). Emotionally,schools may fail to support the building of positive student character (Wara et al., 2018).Poor quality teachers contribute to creating learning gaps which makelearning difficult to occur (Reynolds et al., 2017). In Uganda, low remuneration of teachers has impacted greatly on the school environment and student engagement (Elasu et al., 2018) making teachers hate teaching. The school environment may impact students' cognitive engagement by supporting students to investment their time in class activities, learning and self-regulated study (Wara et al., 2018). Cognitive engagement is about the epistemological understanding of schooling whereby teachers are supposed to transmit knowledge and wisdomto transform the students' human sensory experiences (Shriand Ranjan, 2019). Cognitive engagement therefore focuses on the student's internal investment in the learning process, which involves learning, understanding, and mastering knowledge and acquiring skills (Cooper, 2014; Shernoff, 2013; Yazzie-Mintz and McCormick, 2012).

According to Cary (2017), the school climate can also regulate emotional engagement of the students.Such a school looks at the axiological belonging of the student through developing students' emotional levels and understanding. Renninger and Bachrach (2015) with Stipek (2002) indicate that the emotional aspect of schooling is supposed to nurture in students thefeelings of belonging, value and appreciation of education. In emotional engagement, according to Finn and Zimmer (2012), there is that sense of identification with the school. There is also growing interest and a sense of preference for learningby students and their teachers. However, Daniels and McCaffrey (2016) insist that students' emotional encounters need to be regulated in the school environment because at times they affect the students' moral decisions.

Emotional challenges may prohibit students to make plausible moral choices. Eventually, the students can become slow learners and their emotions supersede their intellectual development.

Olayinka (2016) remarks that school cultures can influence students' behavioral engagement when these culturesfocus on pedagogical experiences thatpsychologically build desirable character traits. Pagan's argument is similar to that of Cooper (2014) who says that behavioural engagement could focus onstudent conduct in class, student participation in school activities and student interest in academic tasks and mentorship.When all these student engagement aspects are given school attention, students who are engaged become more thoughtful, strategic, and willing to exert effort to grasp complex ideas and tend to change life in more professional pathways (Christenson et al., 2012). Therefore, school environments have the ability to focus students to that behaviour and attitude that exhibits high performance (Saeed and Zyngier, 2012; Patrick et al., 2007).

The authors adopted Murray et al. (2004) theory of school engagement (Figure 1) as the theoretical framework for this study. They identify engagement using three dimensions: behavioural (students' participation in education including the academic, social and extracurricular activities of the school), emotional (students' emotional reactions in the classroom and in the school which includes a sense of belonging or connectedness to the school), and cognitive/academic engagement (students' investment in their learning (motivation and self-regulation).

Working with participant voices from questionnaire responses and interviews as well as published literatures, the study builds on earlier research on school environment and student engagement.

MATERIALS AND METHODS

Study design and Participants

The study used the mixed method design to gather both quantitative and qualitative data (Kothari, 2004) from eight USE schools of Tororo district in Eastern Uganda. The Mixed method design was used because of its flexibility in generating data for studying complex educational

problems. Using the two research approaches (qualitative and quantitative) permits a better understanding of research problems and givesa comprehensive picture of educational problems (Creswell, 2013; Creswell and Garrett, 2008). In total, 404 student participants (240 males and 164 females) and 40 teachers (20 males and 20 females) were recruited for the study. Majority of the student participants (49.3%) were aged 17-18 years. This shows that students in the USE schools enter secondary education when they are a little older than the official range of 13-16 years (Huylebroeck and Kristof, 2015).There isneed to sensitize parents and guardians to take their children to school early enough to avoid children ageing in school.About (33.2%) student participantswere aged 14-16 years,(14.1%) aged 19-20 years and the least(3.5%) aged 12-13 years. We used both questionnaires and interviews to collect data. The interviews supplemented data fromquestionnaires. Student participants responded using questionnaires while teacher participants were individually interviewed.

Selection of Participants

The researchers obtained class registers for a random selection of students to participate in the study. Students were picked mainly from senior three (Grade 3) to senior six (Grade 6). Researchers sought consent from head teachers and parents on whether students could participate in the study(Creswell, 2002). When the headteachers accepted students to participate in the study, they were given consent forms to sign on behalf of the students. The objective of the research was then explained to the students.Students were further told that participation is voluntary and they could voluntarily quit the study anytime if they felt they should not continue. In the event that they chose to quit the study, any information they had already given would not be used on their request.

After obtaining permission from the headteachers to interview their teachers, the researchers got lists of the teachers in each sampled school. From these lists, the researchers randomly selected 5 teachers in each of the eight schools to make forty teacher participants. The researchers then requested the selected teachers to participate in the study. However, the researchers told the selected teachers that participation in the study was voluntary. Whoever felt like not participating at all or wanted to withdraw from the study, was free to do so at their own will. When some teachers declined participation in the study, others were randomly selected to replace them. A timetable for the interviews was then drawn by the teachers and the researchers to fit in the 2-weeks designated for the entire fieldwork. They key questions that guided the interview process are in appendix 1.The interview was more conversational in order to create room for brainstorming of ideas and getting in-depth responses from the teachers. The responses were tap-recorded and afterwards transcribed for purposes of qualitative analysis.

Measurement of Variables

The primary dependent variable was student engagement with composites (*affective engagement=0.80*), (*behavioral engagement=0.78*) and (*academic engagement=0.90*). For this dependent variable, the investigators requested participants to respond to questions (Appendix 2) ofa 3-point Likert scale.The researchers measured the independent variable using three composites: (*physical environment=0.97*), (*instructional environment=0.76*) and the (*social environment=0.88*). The researchers requested participants to address the questions (Appendix 2) of a 4-point Likert scale.For the review of documents, the researchers requested for student results in class tests, end-of term and end-of year exams in order to analyze them. Also, UCE and UACE results (2015-2018) were analyzed to get a general picture of the academic progress of the sampled schools (UNEB, 2018).

Data Analysis

Quantitative data were coded and analyzed using frequency distribution and Pearson Correlation Coefficient. The researchers tape-recorded qualitative data from 40 teachers using key informant interviews. The tape-recorded data was then transcribed and analyzed for possible emerging themes arising from the participant voices. The researchers used qualitative data to back up findings obtained from the analyzed and presented quantitative data in the Tables 1. In a way, qualitative data filled in gaps obtained on generalizations from quantitative findings.

RESULTS AND DISCUSSION

The study adopted mainly frequency distributions (frequencies and percentages) to examine the status of the USE school environment. The study also used Pearson Correlation Coefficient to examine the relationship between the school environment and student engagement.The analysis is presented as follows:

Most participants191 (47.3%) take the physical environment of the schoolto bevery conducive while very few 2 (0.5) say it is not conducive. Most participants 167 (41.3%) agree that the instructional environment of USE schools was conduciveand the social environment 226 (55.9%) was very conducive.The above findings are similar to what the African Development Bank (ADB) Group (2018)project that funded the construction of classrooms, provision of desks, textbooks and sanitary facilities in USE schools in Uganda, found out.

For the general relationship between the school environment and student engagement, the researchers run

Table 1. Status of the USE School Environment

Aspects of school environment	Gender	School Environment Levels			
		Not Conducive (%)	Fairly Conducive (%)	Conducive(%)	Very Conducive (%)
Physical Environment	Male	2(0.8)	35(14.6)	99(41.2)	104(43.3)
	Female	0(0.0)	17(10.4)	60(36.6)	87(53.0)
Total		**2(0.5)**	**52(12.9)**	**159(39.4)**	**191(47.3)**
Instructional Environment	Male	25(10.4)	57(23.8)	103(42.9)	55(22.9)
	Female	8(4.9)	33(20.1)	64(39.0)	59(36.0)
Total		**33(8.2)**	**90(22.3)**	**167(41.3)**	**114(28.2)**
Social environment	Male	2(0.8)	12(5.0)	94(39.2)	132(55.0)
	Female	1(0.6)	8(4.9)	61(37.2)	94(57.3)
Total		**3(0.7)**	**20(5.0)**	**155(38.4)**	**226(55.9)**
Overall Levels	Male	0(0)	33(13.8)	121(50.4)	86(35.8)
	Female	0(0)	14(8.5)	77(47.0)	73(44.5)
Total			**47(11.6)**	**198(49.0)**	**159(39.4)**

Table 2. Relationship between the School Environment and Student Engagement

		1	2	3	4	5	6
School Environment	Physical environment	1					
	Instructional Environment	.562**	1				
	Social environment	.476**	.374**	1			
Student Engagement	Emotional domain	.353**	.240**	.449**	1		
	Behavioral domain	.211**	.055	.307**	.507**	1	
	Cognitive domain	.245**	.162**	.448**	.447**	.511**	1
Pearson Correlation		**0.401**					

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

a Pearson correlation coefficient, and the results revealed a positive significant relationship (*r=0.401, p<0.01*) between the school environment and student engagement in USE Schools (Table 2).

School Environment and Student Emotional Engagement

However, there is a low positive relationship between the physical environment and student emotional engagement(r =0.353, p <0.01). This means the physical environment in USE schools is not specifically conducive for student emotional growth. According to Renninger and Bachrach's (2015) observation, USE schools do not nurture students to feel a sense of belonging, value and appreciate education. This is related with Finn and Zimmer (2012) thatthere is no sense of student identification with their school.

There is a low positive relationship between instructional environment and emotional engagement (*r=0.240, p<0.01*). This implies that teaching in USE schools is not inspirational enough for students to feel a sense of emotional growth. Povey et al.(2016) explain a risk of lowstudent emotional growth when he argues that if students' emotional development is not regulated in the USE school, this is likely to affectstudents'moral judgment

and choices. Classroom instruction must provide both academic, emotional and practical development of learners. There was a moderate positive relationship between the social environment and student emotional engagement (*r=0.449, p<0.01*). This implies that as the school's social environment becomes more conducive, student affective engagement increases. Similarly, Taylor and Parsons (2011) agree that the social environment of the school builds respectful relationships and interactions between students and teachers to enable positive student engagement. The implication is that, a conducive social environment in the school gives an opportunity to students and teachers to learn from one another, accord equal attention to individual questions, allow students to make friends amongst themselves and with school administrators. This helps to improve mutual respect, as it enables students to develop a positive attitude for learning.

School Environment and Student Behavioural Engagement

There was also a very low positive relationship between the physical environment and student behavioural engagement (r=0.211, p<0.01). This implies that as the physical environment becomes more conducive, students' behavioral engagement increases. This argument is in line

with Marzano (2007) who says that the physical appearance of the school influences the art and science of teaching and learning. Students are more than ready to study in an attractive schooling atmosphere. However, there is no significant relationship between instructional materials and student behavioral engagement (r=0.055, p<0.27). This implies that availability of instructional materials does not necessarily influence students' behaviour. When the library has enough textbooks, it is not automatic that secondary school students use them to complete tasks given to them.

There is a low positive relationship between the social environment and student behavioural engagement (r=0.307, p<0.01). This implies that as the social environment becomes conducive, students' behavioral engagement also increases. However, there is no significant relationship between instructional materials and student behavioral engagement (r=0.055, p<0.01). This implies that availability of instructional materials does not influence students' behavioral engagement. When the library had enough textbooks, it was not automatic that students in the USE school would use them to complete the tasks given to them. These results agree with Patrick et al. (2007) who notes that availability of instructional materials influence students' engagement in learning because they can access the content they need for effective study.

School Environment and Student Cognitive Engagement

The study findings reported a low positive relationship between the physical environment and student cognitive engagement (r =0.245, p< 0.01). Sjoblom et al. (2016) agree that when students' physical environment is conducive for cognitive (intellectual) activity, their engagement with the school increases. For a conducive physical environment helps students relate what they are learning for better academic engagement (Veiga et al., 2014). There was also no relationship (r=0.162, p < 0.01) between availability of instructional materials and student cognitive engagement. The study by Wara et al. (2018) recognized that learning from texts with instructional pictures shows no cognitive demands on learners. However, other factors like poor self-esteem, low intelligence, psychological problems, physical ill-health, poor academic performance, class repetitions, poor literacy and numeracy skills, chronic absence from school, family dysfunctionality like conflict and abuse, separation from family, and low socio-economic status explain the low relationship between the physical environment, instructional materials and cognitive engagement. According to Murray et al. (2004), these factors hinder improvement in the students' cognitive ability.

There is also a moderate positive relationship between the social environment and student cognitive engagement (r =0.448, p < .01), implying that a conducive social environment in the school provides positive

cognitive development of learners. According to Wawrzynski et al. (2014), when students build good social relationship with peers in and outside class, they progress interest in learning while increasing school-wide concentration. It is a social justice obligation of schools to build a conducive social environment for the learners to develop their identity and that of others with whom they interact on a daily academic and emotional basis. If this enabled, students become great agents of change in their classrooms, schools and communities, which is the purpose of life education and citizenship growth.

CONCLUSION

The study makes an important observation that student engagement in school experiences depends on the physical, instructional and social environment of the school, although the causality is negligible. Student engagement in this context means harnessing the affective, behavioural and cognitive experiences of students. To strengthen this engagement, we recommend as Wang and Holcombe (2010) that there is a need to identify other factors that influence student engagement apart from the school environment conditions. To improve students' emotional engagement, USE schools should provide counseling and guidance services. Improving students' academic engagement requires the provision of an environment conducive for students' instruction such as good libraries, availability of textbooks, experienced and quality teachers, as well as provision of adequate infrastructure conducive for learning like science laboratories and adequate classrooms. For behavioral engagement of students, USE schools should encourage teachers to integrate values into learners' discipline.

Conflict of interests

The authors declare that they have no conflict of interests.

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Appendix 1: Interview Guide

1.   In your opinion, what constitutes the school environment?
2.   How do students engage in emotional, cognitive and behavioural activities and experiences in this school?
3.   How does your school environment influence student engagement in cognitive, emotional and behavioural activities?

Appendix 2: Questionnaire
Dependent Variable—Student Engagement
For questions 1-3, tick the most appropriate answer as (1=poorly satisfied; 2=fairly satisfied; 3=highly satisfied).

N	Questions	1	2	3
1.	Are you satisfied that students in this school are engaged academically?			
2.	Are you satisfied that students in this school are emotionally engaged?			
3.	Are you satisfied that students in this school are behaviorally engaged?			

Independent Variable—School Environment
For questions 4-7, tick the most appropriate answer as(Not Conducive=1; Fairly Conducive=2; Conducive=3; Very Conducive=4).

N	Questions	1	2	3	4
4.	Do you think this school provides a conducive environment for students to engage and grow academically?				
5.	Do you think this school provides a conducive environment for students to engage and grow emotionally?				
6.	Do you think this school provides a conducive environment for students to engage and grow behaviourally?				