

# Students' motivational factors and engagement strategies in constructivist-based blended learning environments

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Student motivation to learn is an essential component for the design, development and implementation of technology-mediated learning environments. Engagement learning strategies have been devised to assist students as they learn in a constructivist-based blended learning environment (CBLE). This study investigates the relationship between students' motivational factors and their engagement learning strategies in a CBLE in Tanzanian Universities. Specifically, the study examines a) student motivational factors to learn, b) gender differences in motivational factors, and c) relates motivational factors with students' engagement learning strategies. The study is built on theoretical foundations of engagement learning and constructivist-based blended learning. We used a self-report student motivational factors and engagement learning strategies survey (SMFELSS) to obtain data from 1000 undergraduate students from three universities. The results indicate that students are positively motivated to learn in CBLE. Our results also reveal that there is a statistically significant correlation between motivational factors and students' engagement learning strategies. The results, on the one hand, enhance our understanding of students' motivational factors to learn in a CBLE, and on the other hand expand knowledge on which student engagement learning strategies should be adopted and implemented in the context of challenging learning environments. Furthermore, the results are important for instructional designers, university teachers and curriculum developers. Our study further helps to improve the design of blended learning courses, constructivist learning environment and learning activities concerning students' motivational factors and engagement learning strategies.

*Key words:* motivational factors, constructivist-based learning, blended learning environment, engagement strategies, learning

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## 1. Introduction

Student motivational factors and engagement strategies in authentic learning tasks continue to be a critical topic of ongoing research in higher learning institutions (HLIs). Innovative instructional technologies, curriculum redesign and implementation of constructivist-based blended learning environments (CBLE) require a high level of student engagement in meaningful, sustained learning experiences (Duffy & Jonassen, 1992a;

Garrison & Archer, 2000; Ramseier, 2001; Ocak & Akçayır, 2016). Studies by Duffy and Jonassen (1992b), advocate that CBLE emphasize cognitively challenging learning tasks, which enhance active participation in the specific learning environment. Methods that encourage students to reflect on their own learning through the use of multiple collaborative learning tools and engagement strategies are more valuable than a mere limited and traditional model of teaching and learning (Jonassen, 1991).

Although motivational factors and engagement learning strategies have been researched in diverse learning contexts (Ryan & Deci, 2000; Bong, 2001; Seki, 2014; Umemoto & Tanaka, 2017), two areas need more attention. First, previous studies on motivational factors have focused on school, subject level, gender and attitude variables toward learning in general (Ramseier, 2001; Gedera, Williams & Wright, 2015; King, 2016). Second, most studies on motivational factors and engagement strategies have only focused on specific education constructs mostly instructional design, technology diffusion and academic outcomes (Thijs & Verkuyten, 2009; Trowler, 2010; Clayton, Blumberg, & Auld, 2010; Lackey, 2013). Consequently, addressing the limitations, our central focus is to examine the relationship between student motivational factors and engagement strategies in CBLE, measuring four motivational factors of self-efficacy, extrinsic, intrinsic and task value and three engagement learning strategies of capturing, supporting, and fascinating strategies.

Learning environments in developed countries that take in multiple perspectives, including digital technologies and constructivist pedagogies, seem to attract student motivation and engagement toward learning. However, little attention has been paid to more challenging learning contexts, such as those found in Tanzania. Higher education in Tanzania consists of universities, university colleges and non-university institutions accredited by the Tanzania Commission for Universities (TCU), the National Council for Technical Education (NACTE). Although HEIs are regarded as autonomous bodies, TCU and NACTE are responsible for the provision of quality higher education, continuous quality assurance checks and oversee both public and private HEIs. While curriculum development in HEIs is based on both internal and external stakeholders' demands, its implementation is subject to TCU and NACTE approval. In this case, adoption and deployment of CBLE in HEIs is the result of the Tanzanian government's push to prioritise and recognise the use of the Internet, digital instructional technologies and multiple delivery modes in education provisions. These priorities are expressed in both old and updated Tanzanian information communication technologies (ICT) policies and education policy (URT, 2016; URT, 2014; URT, 2010; URT, 2007; URT, 2003). There is no single study into digital technologies and constructivist pedagogies in a specifically Tanzanian context. Such research is needed to establish student motivational factors and engagement strategies employed in CBLE.

## 2. Theoretical background

The study is grounded in two theoretical frameworks. The first is engagement learning theory based on motivation and other elements of learning theories (Kearsley & Shneiderman, 1998), and the second is social constructivist learning framework (Vygotsky, 1978).

### 2.1. Engagement framework (EF)

Achieving high-quality learning outcomes in challenging sociocultural contexts requires active student participation and involvement in authentic learning activities. As such, the framework influences effective student engagement in dynamic and complex academic learning environments which necessitates teamwork, collaborative learning, shared experiences and co-creation of meaning (Coates, 2006; Kearsley & Shneiderman, 1998). Kearsley and Shneiderman (1998) suggest that in technology-enhanced learning environments, students engage more effectively in learning activities that are meaningful. As EF is structured around a student-centred approach, the current study emphasises studying student motivational factors to learn in a technology-supported learning environment. Marshall's (2007) study advocates that technology "can facilitate engagement in many ways which are difficult to achieve otherwise" (p.109). Therefore, the EF principle (cf. relates, create, donate) suggests that for successful student engagement in authentic learning activities, the focus should be on the use of multiple learning perspectives within technology-enhanced learning environments.

### 2.2. Constructivist framework

Constructivist framework (CF) is regarded as an epistemological study of the nature of knowledge and how human beings learn (Ültanır, 2012), and that "mental structures and operations are actively constructed by one's mind rather than passively acquired" (Riegler, 2012). Constructivists believe that students individually and socially construct knowledge (Vygotsky, 1978; Duffy & Jonassen, 1992a; Jonassen, 1994; Jonassen & Rohrer-Murphy, 1999), and that their engagement in the meaning-making is a pre-requisite for their authentic learning (Bruner, 1990). Researchers have argued that constructivist-educators actively engage their students in meaning making and problem-solving (Duffy & Jonassen, 1992b). For example, Ertmer and Newby (1993) suggest that engaging students in constructivist learning enhances their ability to interpret the world as they interact with contents and learning environments. As such, a constructivist teacher should present information and skills in relevant, interesting contexts because it will enable students to share, reuse and transfer expertise and knowledge in the real-world situations. Furthermore, in CBLE an emphasis is anchored on the individual active use of what is learned and engaged based on different purposes and times (Duffy & Jonassen, 1992b). Therefore, in the current study, a significant emphasis of CF is that knowledge construction is an essential aspect of the learning environment and that know is an active process not a product.

### 2.3. Student motivational factors in CBLE

Previous studies have examined student motivation to learn in computer-mediated learning environments (Rasch, 1997). In this study, we operationalise motivational factors as types of student goals and drive to adopt, pursue, engage in authentic learning in CBLE (Elliot, 2005; Schober & Keller, 2012; King, 2016). Motivating students to engage in authentic learning in CBLE in a resource-poor context is still a challenge that needs extensive research. In such a context, this study aims to establish student motivational factors influencing their engagement in CBLE. Although there are several motivational factors, intrinsic and extrinsic factors dominate most of the debate in research (Pintrich & De Groot, 1990; Parajes, 1996; Ramseier, 2001; Gedera et al., 2015; Lackey, 2013).

Regarding student motivational factors in CBLE, this study examines four motivational factors including intrinsic, extrinsic, self-efficacy and task value. On the one hand, *intrinsic motivation* is a personal innermost psychological need for competence and autonomy which is associated with passion and joy of doing a learning activity (Ryan & Deci, 2000; Seki (2014)). On the other hand, *extrinsic motivation* refers to personal external distinguishable behaviours toward a task or activity such as good grades, grading systems, high payment, instructional strategies, learning conditions and educational technologies (Gedera et al., 2015). Wigfield and Eccles (2002) further suggest that hard-work and success such as task choice and persistence are determined motives, expectancies and values for constructivist students.

Bong (2001) reports that *task-values* are “potential success factors on relatively difficult tasks that are judged to hold greater incentive values” (p.554) which seem to encourage students authentic learning. Task value in CBLE is related to most of the academic tasks which promote students’ interest, achievement, and enhance self-esteem.

Such tasks accelerate in-depth engagement in the subject matter. Furthermore, Bandura’s (1997) study suggests that self-efficacy and pedagogical efficacy have a positive impact on student learning regardless of the learning environment. For example, in CBLE students who are self-sufficient and confident demonstrate the ability to deal with challenging academic tasks and are more likely to engage in meaningful learning (Ritchie, 2015; Stephen, 2015). In the context of CBLE, studies have shown that the combined advantages such as flexibility and personalised learning enhances student motivational factors, achievement and increases task value henceforth deep learning (Saeed & Zyngier, 2012; Radovan & Makovec, 2015).

### 2.4. Student engagement learning strategies

Engagement refers to the psychological investment and effort devoted to understanding the task the student is encouraged to undertake (Ryan & Deci, 2000; Saeed & Zyngier, 2012). In this study, we operationalise student engagement learning strategies as the quality of students’ participation and practices in academic work. Studies show that student engagement encompasses the complexity of human development domains (i.e., physical, psychological and cognitive) which determine their successful engagement in the learning environment (Skinner & Belmont, 1993; Skinner, Kindermann & Furrer,

2009). Crick and Goldspink (2014) suggest that student engagement is when students are interested in the task or work at hand even when the work is thought-provoking.

However, in this study, student engagement learning strategies is conceptualised as the plans and techniques students draw up, put forth and carry out to achieve their intended learning outcomes in a well-established and active learning environments. Such engagement learning strategies should be appropriately redesigned so as to enable authentic engagement in CBLE (Seki, 2014; Gedera *et al.*, 2015). Studies have shown that student engagement represents the amount of time and effort students invested in their learning that constitutes their academic achievement (Turi, 2012). Trowler (2010) adds that the interaction between time, effort and other relevant resources invested play a significant role to optimise student engagement, learning experiences and enhance achievement of their intended learning outcomes (Thijs & Verkuyten, 2009).

Research has explored diverse factors and strategies used to encourage students' engagement in their learning process (Jeffrey, Milne & Sudday, 2012; Seki, 2014). This study focuses on three student engagement strategies: capturing, support, and fascinating strategies (Pintrich & Garcia, 1994; Trowler, 2010; Jeffrey *et al.*, 2012; Rosegard & Wilson, 2013). Jeffrey *et al.* (2012) suggest that capturing strategy (cognitive engagement) occurs when a teacher at the time of teaching begins by assessing student attention, recording observable individual socio-emotional, behavioural and cognitive processes. Moreover, teachers who employ a capturing strategy normally assess student orientation to sensory events, mental efforts, detect signals for focal processing and maintaining an attentive state (Rosegard & Wilson, 2013).

Support strategy (metacognitive engagement) refers to students' ability, awareness and knowledge to use designed instructional objectives, innovative teaching gadgets, guidelines and course syllabi (Clayton *et al.*, 2010; Jeffrey *et al.*, 2012). Learning rubrics that support student learning are regularly modified and improved to assess and accommodate learning relevance, rigour and relationship. Furthermore, elements of support strategy are more likely to involve challenging, authentic tasks and timely feedback (Jeffrey *et al.*, 2012) which promote student engagement in learning. Another important strategy is a fascinating strategy (re-engagement) which refers to behavioural components of self-regulated learning and involves the use of multiple practices, mind tools and socio-academic media which are central to collaborative learning experiences (Coates, 2006; Vaughan, 2014). Findings also show that the fascinating strategy attracts the interest of students to re-engage in authentic learning and hence achieve intended learning outcomes (McMahon & Zyngier, 2009; Clayton *et al.*, 2010; Gedera *et al.*, 2015). Therefore, this study examines student motivational factors and engagement strategies reported by Tanzanian universities' students studying in CBLE.

### 2.5. Gender differences in CBLE

Digital instructional technologies in higher education have changed the landscape of teaching and learning. With technological integration in education, student learning approaches, skills and tactics differ according to gender regardless of changes in the

learning environments engaged (González-Gómez, Guardiola, Rodríguez & Alonso, 2012). As in e-learning, the roles of students and teachers in CBLE change accordingly (González-Gómez *et al.*, 2012). As such scholars have widely studied the importance of gender differences among students at different level of education provision (Stoilescu & Egodawatte, 2010; Voyer & Voyer, 2014). Although there are contradictory results in gender-based studies, most of studies on gender favour female students in diverse contexts (King, 2016; Dang, Zhang, Ravindran & Osmonbekov, 2016). However, studies have focused on specific variables such gender and performance; gender and personality; gender and academic achievement (García-Gil & Andreu, 2017). Moreover, a study on computer science programs show similar ratios of participation between male and female students (Stoilescu & Egodawatte, 2010). Furthermore, a study on the use of computers and the Internet show that male students report using technology-enhanced education and computers more often than female students (Drabowicz, 2014). In this study, we thought that examining gender differences in CBLE would reveal interesting findings. The primary contribution this study might make to the literature in the field is an increased understanding of what female and male students consider to be most significant regarding motivational factors to learn and their engagement strategies in CBLE in a Tanzanian context.

#### 2.6. *Constructivist-based blended learning environment (CBLE)*

CBLE refers to an active collaborative learning environment which takes in authentic learning activities with an emphasis on the use of in-class and digital instructional technologies in meaning-making. Duffy *et al.* (1992) suggest that the coexistence of in-class and out-of-class learning activities enable student construction of knowledge with the support of computer-assisted delivery and digital instructional technology. The literature also suggests that CBLE entails knowledge construction with the use of traditional in-class and virtual learning approaches in which mind tools such as computers and computer applications play a crucial role in enhancing teaching and learning (Garrison & Archer, 2000; Peralta & Priego, 2013). Moreover, CBLE is a formal learning environment that combines the advantages of collaborative web technologies and in-class teaching and learning methods in which students' motivational factors connect through constructivist principles (Garrison & Kanuka, 2014; Vaughan, 2014). CBLE provides students with opportunities to construct knowledge based on their own prior experiences through experiential and interactive authentic learning tasks with computer-assisted instructions (Bruner, 1990; Garrison, Anderson & Archer, 1999; Tarnopolsky, 2012).

In practice, successful CBLE exhibits relevant academic collaborative task used to encourage and promote students' engagement and hence contribute to improvements in their learning practices. Furthermore, CBLE involves the use of cognitive tools (*cf.* computers and its applications) and multiple tiers of self-sufficient, computer-delivered, problem-based learning environments in which authentic learning tasks attract student engagement in deep and meaningful learning. The use of CBLE is centred on well-designed, active and contextualised constructivist principles that attract student attention, motivation and interest to collaborate, teamwork, engage and interact in a community of

learners (Garrison & Archer, 2003; Vaughan, 2014). In brief, CBLE focusses on student collaborative and authentic teaching and learning in which active student involvement and academic achievement depend on their prior experiences as they embark on constructing their own knowledge through the use of both in-class and out-of-class learning advantages.

### *2.7. The relationship between motivational factors and engagement learning strategies*

The relationship between motivational factors and engagement learning strategies has been variously studied. Studies have shown that both motivation and engagement help students to achieve sound academic outcomes (Ryan & Deci, 2009; Klem & Connell, 2004). Other studies have shown that students are more likely to employ diverse engagement factors when they are motivated to learn in e-learning (Skinner & Belmont, 1993; Peralta & Priego, 2013; Stephen, 2015). Although there are some studies on the relationship between motivation and engagement, most do not directly address the relational aspects of motivational factors and engagement learning strategies (Saeed & Zyngier, 2012; Radovan & Makovec, 2015). However, most of the studies on student's motivation and engagement have intensively focused on academic achievement and qualities of engagement toward authentic learning (Thijs & Verkuyten, 2009; Stephen, 2015). It is suggested that a well-established relationship between student motivational factors and engagement strategies would enable students to engage in authentic learning that may lead to educationally productive activities (Norberg, 2011; Vaughan, 2014). Therefore, our study addresses this gap in the literature by identifying the relationship between a wide range of student motivational factors and engagement learning strategies in CBLE.

### *2.8. The purpose of the study*

The study investigates the relationship between students' motivation factors to learn and their engagement learning strategies in CBLE in Tanzanian universities. Specifically, the study aims to: a) identify students' motivational factors and engagement strategies, b) find out gender differences in motivational factors and engagement strategies, c) examine whether students' motivational factors relate to their engagement learning strategies in CBLE. These objectives raised three research questions:

- a) What are the Tanzanian university students' motivational factors and engagement strategies in CBLE?
- b) Are there gender differences in motivational factors and engagement strategies in CBLE among Tanzanian university students?
- c) How are Tanzanian university students' motivational factors related to their engagement learning strategies in CBLE?

### 3. Methods

#### 3.1. Setting and design

The study involved three universities in Tanzania during the 2016/2017 academic year. The selection of universities was based on two major criteria: (a) implementing of LMS (cf., e-learning) and/or CMS (cf., web-based publishing) (b) offering blended learning courses coupled with constructivist pedagogy. Both LMS and CMS, either strategically or methodically, were used as a blended learning platform; for example, communications within the large university communities, designing, modifying and updating content, uploading and downloading curriculum content as well as both online and offline social interactions. Social constructivist epistemology was used to examine student multiple realities, activities and practices whereby established meanings were based on student collaborative learning experiences. The CBLE design involved both in-class methods and digital learning technologies coupled with student sustained learning experiences. However, most of CBLE designs were subject to the discretion of individual teachers and were not institutionalised. The study used a multiple non-interactive research design including student survey and structured-non-participant-observation while collecting quantitative data. Consequently, the strategy assisted triangulation of relevant findings from various sources.

#### 3.2. Participants

The study involved 1010 undergraduate students 746 (73.9%) from the first university, 76 (7.5%) from the second university and 188 (18.6%) from the third university. Among the participants, 553 (54.8%) were female, and 457 (45.2%) were male students ranging in age from  $\leq 20$  years to 40 years old. Of these, 594 (58.8%) students were in the first year, 148 (14.7%) were in the second year, and 268 (26.5%) were in the third year of their studies. All participants were enrolled either in two or three blended learning courses. That is, students had reasonable knowledge and skills regarding blended learning approach and constructivist learning principles. As such, students were involved in both online and offline discussion forum, group work and team learning. Table 1 indicates overall demographics of the sample.



	Categories	N	%
Gender	Male	553	54.8
	Female	457	45.2
Age	≤ 20	153	15.1
	21-30	791	78.3
	31-40	57	5.6
	41+	9	.9
	Year of study	1st year	594
	2nd year	148	14.7
	3rd year	268	26.5
University	U1	746	73.9
	U2	76	7.5
	U3	188	18.6
Degree programme (with blended learning courses)	Business studies	276	27.3
	Economics	48	4.8
	Management studies	224	22.2
	Educational Studies	245	24.3
	Computer studies	217	21.5

U<sup>1</sup> = University 1; U<sup>2</sup> = University 2; U<sup>3</sup> = University 3

Table 1: Demographics of the sample (n = 1010).

### 3.3. Procedure

In this study, we used two sampling procedures: stratified and purposeful sampling. Stratified random sampling was used in selecting three universities while purposeful sampling was used to select respondents who were engaged in CBLE. Moreover, the study used multiple steps in data collection. The first step involved both preliminary and actual structured observation whereby the first author together with two research assistants, visited three selected universities (In April 2016) for two reasons: (a) observe student experience regarding social constructivist learning practices (b) conduct mini-unstructured interviews with system administrators, e-learning coordinators and students. The approach intended to improve non-participant observation checklists relevant to the topic under study.

In the second step, we conducted actual structured-non-participant-observation in three universities. We observed student engagement and constructivist learning based on learning activities, tasks, learning approaches, ways of engagement, events and behaviours which assisted in acquiring hands-on students' CBLE experiences. That is, non-participant observation involved assessing constructivist pedagogies, practices and experiences used to facilitate knowledge construction among students including peer interactions (both online and offline discussion forums), student assessments (online and

offline) and student support services. Similarly, structured-non-participant-observation was based on the number of specific days (cf. 21 days per university). The third step involved student survey whereby 1010 questionnaires were administered to students among distinct 10 face-to-face classes. Two research assistants simplified administration of the questionnaires whereby students completed the surveys in a single sitting within a maximum 20-minute period.

### 3.4. Instruments and measurements

#### 3.4.1. Questionnaire on student motivational factors and engagement learning strategies

The study used a student motivational factors and engagement learning strategies survey (SMFELs). SMFELs is a self-developed survey with insight from the work by (Herzberg, Mausner & Snyderman, 1959; Coates, 2006; Trowler & Trowler, 2010; Crick & Goldspink, 2010; Jeffrey et al., 2012; Ocak & Akçayır, 2013; Gedera et al., 2015; King, 2016). However, information on demographic characteristics (5 items, i.e., gender, age, year of study, degree programmes) was not drawn from these studies. Because we wanted to optimise the efficiency of test delivery and scoring procedures whereby cognitive attributes would involve generating responses to items, polytomous item response theory was used to develop the SMFELs (Kim, 2002; Penfield, 2014). Polytomous item response theory is commonly used when developing items having more than two scoring outcomes (Rasch, 1960; Penfield, 2014; Kim, 2015). SMFELs measured motivational factors inventory (MFI) and engagement learning strategies inventory (ELSI). Categorically, MFI involved four subscales including self-efficacy (8 items), task value (6 items), intrinsic (6 items) and extrinsic (4 items). ELSI had three subscales such as capturing (6 items), supporting (5 items) and fascinating (6 items). Our SMFELs version had 46 variables. SMFELs consisted of a five Linkert-type scoring scales (i.e., 1 strongly disagree to 5 strongly agree). For MFI, the following Cronbach's Alpha reliability of each construct was obtained: self-efficacy (.85), task value (.80), intrinsic (.70) and extrinsic (.74). Furthermore, for ELSI, the following Cronbach's Alpha reliability of the three subscales was found: capturing (.71), supporting (.81) and fascinating (.83).

#### 3.4.2. Observations

A structured observation form (observation checklist) was used to acquire qualitative data based on student behaviour related to their engagement learning strategies and information relevant to CBLE. The structured observation form was logically used for two reasons. First, to assure consistency and trustworthiness of data being observed from diverse non-participant observers. Second, to check on validity by comparing information observed between the main researchers and research assistants after debriefing.

### 3.5. Data analysis

#### 3.5.1. Quantitative data 'motivational factors and engagement strategies'

This study used multiple data analysis techniques as the mixed methods research design was used to collect data. Exploratory factor analysis (EFA) and was used to deter-

mine the number of factors generated from the data. Also, confirmatory factor analysis (CFA) was used to re-analyse the instruments and validate interrelationship between variables (see Appendix I & II) as some instruments and items were from the work of other scholars. We used descriptive statistics (cf. mean scores), the Mann-U test, correlation analysis and multiple linear regression to analyse quantitative data. On the one hand, the Mann-U test was used to determine gender differences in terms of motivational factors and engagement learning strategies in CBLE. On the other hand, we used Spearman rank-order correlations to examine the interrelationship between motivational factors and engagement learning strategies. Strategically, multiple regression was conducted to investigate the significant predictors of student engagement learning strategies in CBLE. In the final analysis, the reliability of the categories was computed through Cronbach's alpha.

### 3.5.2. Student engagement behaviour and practices in CBLE

Content analysis was used to analyse student engagement behaviour and practices to predict their engagement learning strategies in CBLE. An 'outsiders' view was used since the study collect non-participant observation data. Two aspects of student behaviour and practices were in place to measure student engagement learning strategies in CBLE, and one aspect regarding infrastructure necessary for CBLE implementation was observed. The aspects include (1) learning activities (cf. online posting and downloading, direct lecture, tutorial sessions, online discussions and assessments); (2) collaborative learning (i.e. group work and team learning); and (3) ICT supportive facilities (i.e. server, student help desk, the internet and e-learning platform). Three aspects were observed daily within one week from each university, making a total of 63 observed cases. Non-participant observation transcripts were coded and analysed based on two non-participant observers reports who were both unobtrusively used in each university. In the final analysis, both quantitative and qualitative analyses assisted in gaining holistic understanding and interpretation of the findings.

## 4. Results

### 4.1. Motivational factors and engagement strategies in CBLE

Analysis of the descriptive statistics of Tanzanian university students' motivational factors and engagements learning strategies in CBLE identified four motivational factors and three engagement learning strategies. Overall, Tanzanian university students were subject to extrinsic motivation factors ( $M=4.20$ ,  $SD=.77$ ) more than other motivational factors such as task value ( $M=4.12$ ,  $SD=.63$ ), self-efficacy ( $M=4.07$ ,  $SD=.67$ ) and intrinsic motivation ( $M=3.91$ ,  $SD=.70$ ). These results suggest that students were motivated by several factors although extrinsic factors dominate their motivation to learn in CBLE. Also, for engagement learning strategies, students in the current sample were highly engaged in CBLE through the supportive learning strategy ( $M = 4.09$ ,  $SD=.70$ ) and capturing strategy ( $M=4.01$ ,  $SD=.65$ ) than fascinating learning strategy ( $M=3.91$ ,  $SD=.73$ ). The results indicate that in CBLE students are more likely to engage in a supportive learning

strategy suggesting that there was a preference for using supportive learning strategies above capturing and fascinating learning strategies. However, Cronbach's alphas coefficients were used to assess the internal consistencies of MFI and ELSI scales, of which students' motivational factors and their engagement learning strategies used in CBLE were assessed. As a result, all scales yielded satisfactory internal consistency. Table 2 provides results of descriptive statistics for all SMFELSs constructs and Cronbach's alphas.

Constructs	Mean	Std. Deviation	Alphas ( $\alpha$ )
<i>Motivational factors</i>			
Extrinsic	4.20	.77	.74
Task Value	4.12	.63	.80
Self-efficacy	4.07	.67	.85
Intrinsic	3.91	.70	.70
<i>Engagement strategies</i>			
Supporting strategy	4.09	.70	.81
Capturing strategy	4.01	.65	.71
Fascinating strategy	3.91	.73	.83

Table 2: Descriptive statistics for all SMFELSs constructs and Cronbach's alphas.

#### 4.2. Gender differences in motivational factors and engagement strategies in CBLE

This study employed Mann-Whitney U test to determine gender differences in motivational factors and engagement learning strategies in CBLE. The results show that there were statistically insignificant differences in gender in terms of motivational factors in CBLE ( $U=120766.5$ ,  $Z=-1.21$ ,  $p=.225$ ). The result further reveals that female students (median = 4.18; mean rank = 548.75) scored higher on engagement strategies than male students (median = 4.12; mean rank = 469.76). That is, sampled students are more likely to use different engagement learning strategies based on their gender groups. Further, the findings reveal that there is a statistically significant difference in gender regarding engagement learning strategies in CBLE ( $U=106596.5$ ,  $Z=-4.29$ ,  $p < 0.01$ ), and the difference between the female and male students is small ( $r = -.13$ ). Table 3 provides summary results.

	Gender	Median	Mean Rank	Mann-Whitney U	Z-score	p-value
Motivational factors	Male	3.79	495.38	120766.50	-1.21	.225
	Female	3.79	517.74			
Engagement strategies	Male	4.12	469.76	106596.50	-4.29	.000
	Female	4.18	548.75			

Table 3: Gender differences in motivational factors and engagement strategies in CBLE.

### 4.3. The relationship between student motivational factors and engagement learning strategies

Table 4 shows that there is a statistically significant relationship between students' motivation factors and their engagement strategies in CBLE. The results indicate that student motivational factors (intrinsic, extrinsic, self-efficacy, task value) to learn in CBLE are correlate significantly with one another, although they all present an aspect of motivational factors, task value and self-efficacy and show a fairly strong correlation ( $r=.521$ ;  $p<.0.01$ ). This underlines the importance of distinguishing between the aspect of motivational factors in CBLE. Our results reveal that there is a moderate level of the relationship among motivational factors to learn in CBLE, suggesting that students who deploy diverse motivational factors are more likely to learn in CBLE. The results further show that engagement learning strategies in CBLE are also significantly related to one another, signifying that students were prone to different engagement learning strategies in CBLE. The correlations show that the higher the motivational factors to learn, the higher the engagement strategies in CBLE.

Constructs	1	2	3	4	5	6	7
<b>Motivational factors</b>							
1. Intrinsic	-						
2. Extrinsic	.263**	-					
3. Task Value	.437**	.393**	-				
4. Self-efficacy	.449**	.420**	.521**	-			
<b>Engagement strategies</b>							
5. CAPs	.341**	.388**	.353**	.395**	-		
6. SUPs	.359**	.406**	.416**	.423**	.508**	-	
7. FASs	.339**	.354**	.413**	.419**	.437**	.536**	-

\*\*  $p < 0.01$

Note: CAPs - capturing strategy; SUPs - supporting strategy; FASs – fascinating strategy.

Table 4: Correlations amongst diverse subscales within MFI and ELSI scales toward CBLE.

Because there were no gender differences in motivational factors in CBLE while the results reported gender differences in engagement learning strategies in CBLE, a series of multiple regressions analyses were run to predict the relationship between student motivational factors from three domains of engagement learning strategies as outcome variables. The findings reveal that the variables entered statistically significantly predicted CAPs, SUPs and FASs. For CAPs ( $R^2=.289$ ,  $R^2_{(adj)}=.286$ ,  $F(4, 1005)=101.93$ ,  $p<.0.01$ ); for SUPs ( $R^2=.279$ ,  $R^2_{(adj)}=.282$ ,  $F(4, 1005)=98.77$ ,  $p<.0.01$ ), and similarly, for FASs ( $R^2=.339$ ,  $R^2_{(adj)}=.337$ ,  $F(4, 1005)=128.99$ ,  $p<.0.01$ ). These results are supported by a standard error of the estimate ( $\delta_{est}$ ) which measure the accuracy of predictions (CAPs,  $\delta_{est}=.545$ ; SUPs,  $\delta_{est}=.595$ ; FASs,  $\delta_{est}=.595$ ).

The results further show that intrinsic motivation (IM), extrinsic motivation (EM), task value (TV) and self-efficacy (SE) were significant predictors with a positive relationship to CAPs, SUPs and FASs. For IM ( $\beta_{CAPs}=.206, \beta_{SUPs}=.159, \beta_{FASs}=.203$ , with  $VIF=1.56$ ), while for EM ( $\beta_{CAPs}=.194, \beta_{SUPs}=.278, \beta_{FASs}=.266$ , with  $VIF=1.35$ ). With regards to SE, the results indicate the following SE ( $\beta_{CAPs}=.156, \beta_{SUPs}=.009, \beta_{FASs}=.163$ ; with  $VIF=1.70$ ) However, the final analysis indicated that task value was a significant predictor of CAPs, SUPs and FASs ( $\beta_{CAPs}=.131, \beta_{SUPs}=.143, \beta_{FASs}=.122$ ; with  $VIF=1.90$ ). Overall, the findings support the predictions that student motivational factors are related to engagement learning strategies in CBLE as also detected by a measure of the accuracy of prediction and multicollinearity using VIF. Table 4 provides a summary of multiple regression analyses results of significant predictors of student engagement learning strategies in CBLE.

Predictor	SUPs			CAPs			FASs			CS	
	b	SE(b)	$\beta$	b	SE(b)	$\beta$	b	SE(b)	$\beta$	Tol	VIF
Intrinsic	.158	.033	.159*	.189	.030	.206*	.211	.033	.203*	.64	1.56
Extrinsic	.253	.028	.278*	.163	.026	.194*	.253	.028	.266*	.74	1.35
Self-efficacy	.103	.038	.009**	.150	.035	.035*	.177	.038	.163*	.59	1.70
Task value	.159	.039	.143*	.134	.036	.131*	.130	.039	.112**	.53	1.90
F (4, 1005)	98.77			101.93			128.99				
R <sup>2</sup>	.282			.289			.339				
R <sup>2</sup> adjusted	.279			.286			.337				
SE of the Est.	.595			.545			.595				

\*  $p < 0.01$ , \*\*  $p < 0.001$

Note: CS = collinearity statistics, VIF = variance inflation factors, Tol =tolerance; SE=standard error.

Table 5: Predictors of student engagement learning strategies in CBLE.

However, for the non-participant observations, the findings were coded and analysed based on a two-step analytic process: first, clustering value categories into patterns and themes; second identifying the key observed values within each university based on the frequency of occurrence. It was observed that the majority of students were engaged in CBLE through collaborative learning strategies by engaging in diverse learning activities including group work and team learning, online discussion, online assessment and peer evaluation. Also, it was observed that both online and offline learning activities were facilitated with available ICT infrastructures including e-learning platform, the internet and institutional repositories (e-libraries) which supported accessibility of digital contents (cf. e-books, e-resources).

Our data show that students accessed 70% of observed ICT infrastructure. As a result, their access enhanced their motivational factors to learn and engagement learning strategies in CBLE. Furthermore, 85% of students observed involved in the private use of classroom and direct instruction, suggesting that diverse factors motivated students to learn in CBLE with diverse engagement learning strategies. Further, during debrief-

ing about gender differences carried out by researchers and assistant researchers, it was observed that both female and male students were strategically engaging in CBLE with limited female student involvement in online discussion sessions. In the final analysis, with the availability of ICT facilities, diverse factors motivated students to learn in CBLE as they were observed using diverse engagement learning strategies during face-to-face sessions. This implies that a variety of motivational factors predict university students' variety use of engagement learning strategies in CBLE so as to achieve intended learning outcomes.

## 5. Discussion

Our study investigated the relationship between students' motivational factors to learn and their engagement learning strategies in CBLE across three sampled Tanzanian universities. Students' motivation factors and their engagement strategies are critical aspects of successful student learning that guide their behaviour toward authentic learning process in CBLE.

### 5.1. Student motivational factors and engagement strategies

The findings indicate that Tanzanian university students are motivated to learn in CBLE based on four motivational factors. However, the results show that students preferred to learn in CBLE due to external motivation factor rather than intrinsic, self-efficacy and task value. The results imply that Tanzanian university students were involved in CBLE because of external factors such as instructional strategies, good grades, learning conditions, educational technologies and assessment. In contrast, Ramseier (2001) found that intrinsic motivation is the best predictor of student learning and that students who are intrinsically motivated are more knowledgeable about the subject matter than those who are extrinsically motivated. Moreover, Brophy (2004) suggested that extrinsic motivation should be used only as arousal of student attention, curiosity, and ambitions to engage in authentic learning. However, it seems that motivating students to learn in CBLE requires accomplishment of many motivational factors associated with multiple engagement learning strategies. Both motivational factors and engagement learning strategies influence authentic learning hence predict achievement of intended learning outcomes.

Although the extrinsic motivation factor to learn in CBLE seems the dominant factor amongst the sampled students, our research confirms the presence of other motivational factors in CBLE. The way students engage in CBLE revealed that the supportive engagement learning strategy leads to other engagement learning strategies such as capturing and fascinating strategies. This finding seems reasonable because students who are supported are likely to engage in authentic learning activities. Although, Jeffrey *et al.* (2012) propose that the capturing strategy should be first followed by other engagement learning strategies like supportive and fascination, our study provides current evidence that supportive engagement learning strategy amongst Tanzania university students plays a significant role among other strategies in influencing their authentic learning in CBLE.

Overall, for effective student learning in CBLE, student motivational factors should be associated with their engagement learning strategies because in a situation where there are no motivational factors it seems challenging to achieve authentic student learning.

### 5.2. *Gender differences in student motivational factors and engagement strategies*

Gender differences may influence motivational factors to learn in CBLE because male and female students may have diverse conceptions and understanding regarding learning environments, engagement strategies, achievement, and educational activities. Studies have shown mixed results regarding gender differences (Dang *et al.*, 2016). In the current study, we found that male and female students share the same motivational factors (intrinsic, extrinsic, task value and self-efficacy), indicating further that Tanzanian university student learning in CBLE might not differ across gender. Moreover, the absence of gender differences in motivational factors might be plausible because other factors perhaps determine successful student learning in CBLE such as instructional strategies, teachers' perceptions and types of learning activities. This study supports and extends previous research addressing the absence of gender difference in motivation (Ramseier, 2001). In contrast, the work of King (2016); Voyer and Voyer (2014) shows that female students tend to outperform male students, and that female students are likely to engage in CBLE. In support of that, based on their number, it is possible that female students were motivated to learn as they were observed engaging in CBLE. As such, female students seem to be motivated as they were observed to be strategically engaged in CBLE. In general, the findings of the current study, add useful evidence-informed insight into the existing knowledge regarding gender in relation to motivational factors and engagement strategies in CBLE and particularly in resources poor contexts.

### 5.3. *The relationship between student motivational factors and engagement strategies*

Students employed different motivational factors in CBLE which in turn influenced their engagement strategies. In this current study, students' motivational factors were significantly related to their engagement learning strategies in CBLE. With the use of different motivational factors based on their sociocultural background and availability of ICT facilities, students were able to apply different engagement strategies so as to learn efficiently in CBLE. As such, we found that students tended to use self-efficacy, task value, intrinsic and extrinsic motivational factors to achieve their intended learning outcomes in CBLE. Furthermore, students' engagement learning strategies were correlated with one another in CBLE, showing that university students with high self-efficacy were highly engaged in CBLE through different engagement strategies. For example, the findings show that extrinsic and intrinsic motivational factors inspired students who tended to apply supportive engagement strategy. The findings also suggest that availability of ICT facilities increases students' motivation to engage in CBLE and achievement of intended learning outcomes and good grades (Klem & Connell, 2004; Ocak & Akçayır, 2013). Further, student motivational factors were appropriate as it seems to predict their engagement learning strategies. As such, motivational factors enhance student engagement learning strategies in CBLE. It was observed that several factors were in line with students' motivational factors



in CBLE including collaborative learning, and availability of ICT facilities. For example, it was observed that with the available ICT support services, students are more likely to act independently, searching for and retrieving information from institutional repositories and engaging in both online and offline group work and team learning.

#### *5.4. Implications, limitations of the study*

##### *5.4.1. Implications of the study*

The current study provides useful insights into student motivational factors in CBLE as university teachers, curriculum developers and instructional designers can use to design appropriate learning activities which attract students' engagement in CBLE. Indeed, the study provides an in-depth understanding of gender differences regarding engagement learning strategies. As such, our results offer several recommendations. First, teachers should influence collaborative learning among gender groups as they engage in CBLE. Second, teachers should design learning activities that encourage students' intrinsic motivation factor. Third, engaging students in CBLE enhances their learning approaches, and henceforth, authentic learning. The study makes a significant contribution to developing curriculum in the design of blended learning courses regarding students' motivational factors. Third, reflection on student engagement learning strategies so as to increase awareness on what motivates students to engage in CBLE. In general, the findings provide appropriate and interesting ideas about the motivational factors and engagement strategies that would be considered to enhance student authentic learning in CBLE. It also adds to existing knowledge on motivational factors and engagement strategies in CBLE.

##### *5.4.2. Limitations of the study and future research directions*

This current study has several limitations. First, although multiple sources of data and random observations were used, the study was limited to survey and structured-non-participant observation. Future research might benefit from interviews and participant observations. Second, the study strategically collected data from three universities in Tanzania; future research should involve more universities (*cf.* internationally) practising CBLE to obtain a holistic understanding of students' motivational factors and engagement learning strategies. The third limitation is concerned with motivational factors (four factors) and engagement strategies (three strategies) which might be limited to understanding general aspects of student motivational factors and engagement strategies. Further empirical studies are needed to replicate the results in diverse contexts. Fourth, although the current study shows substantial reliability, further research should focus on establishing interrater agreement and employ more observers.

## **6. Conclusion**

In conclusion, this study established that intrinsic, extrinsic, task-value and self-efficacy motivational factors predict students' engagement learning strategies in CBLE. Our study draws the following conclusions: first, students use several motivational factors

in CBLE. Thus, teachers should recognize these motivational factors and make changes in their constructivist alignment. Second, there were no gender differences regarding motivational factors in CBLE. However, there were gender differences between female and male students regarding their engagement strategies. Third, the conclusion is that students' motivational factors have a direct impacts on their engagement learning strategies in CBLE. As a result, teachers and instructional designers should also reflect on the designed instructional objectives and learning activities in CBLE.

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### Appendices

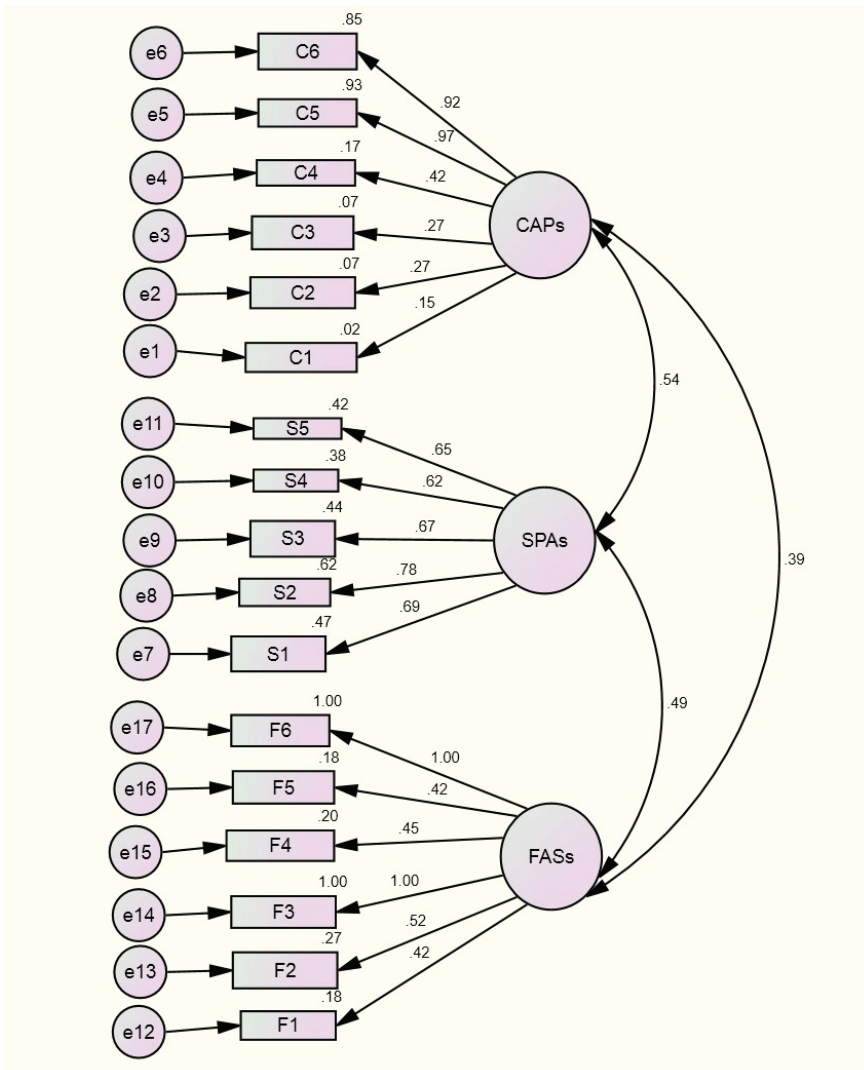


Figure 1: Confirmatory factor analysis indicating interrelationship between student engagement learning strategies in CBLE.

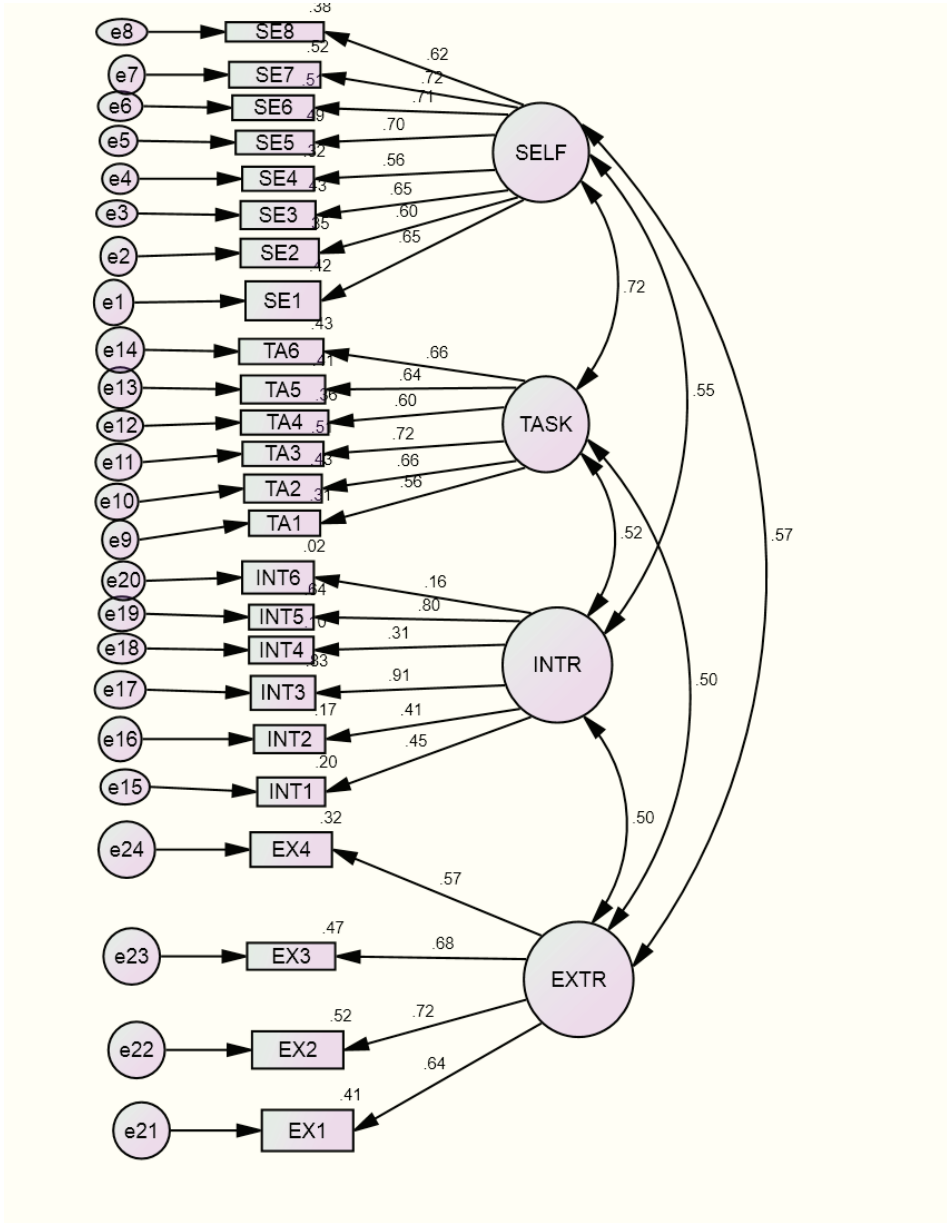


Figure 2: Confirmatory factor analysis indicating interrelationship between student motivational factors in CBLE.