# THE MEDIATING EFFECT OF CONSTRUCTIVIST LEARNING ENVIRONMENT ON THE RELATIONSHIP BETWEEN SCHOOL CULTURE AND STUDENT ENGAGEMENT IN TECHNOLOGY AND LIVELIHOOD EDUCATION

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**Abstract:**

The aim of this study was to determine the mediating effect of a constructivist learning environment on the relationship between school culture and student engagement in technology and livelihood education in Davao del Sur, Philippines. To determine the mediating effect of constructivist learning, correlation design employing mediating analysis was employed in this study. Adapted survey questionnaires were utilized for a sample of 400 students from public schools in Matanao, Bansalan, Magsaysay (MABAMA) District, Davao del Sur. The questionnaires were validated by experts contextualizing to the local setting. Regression and Path Analysis were used to determine the mediating effect of a constructivist learning environment on the relationship between school culture and student engagement of students in TLE. The results showed that the level of constructivist learning environment is high, the level of school culture is high, the level of student engagement is very high, and there were significant relationships between constructivist learning environment and school culture and student engagement. The significant effect showed partial mediation. Thus, the TLE students' constructivist learning environment partially mediates the relationship between school culture and student engagement.

**Keywords**: education, constructivist learning environment, school culture, student engagement, Philippines

## 1. Introduction

Engagement in learning has been considered a contributory aspect not only in uplifting academic achievement but also in the development of students' positive attitudes toward

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learning (Hart et al., 2011). The constructivist approach enables students to break away from their shyness and allows active engagement in classroom activities (Maheshwari & Thomas, 2017). For which, teachers must be sensitive to know if school culture can affect positively the student's progress as they engage in learning and be more innovative in developing a strategy for the students to increase significant results in their academic performances, especially Technology Livelihood Education (TLE) subject.

Student engagement, in a global view, is a growth-producing activity in which an individual allocates attention in active response to the environment. Engagement related to school activity has become an important concept related to multiple educational outcomes. Student engagement has been identified as a primary variable in understanding dropout, particularly as a gradual process operating in a student's life and influencing that final decision to withdraw (Hart, et al., 2011; Appleton, et al., 2008). Furthermore, student engagement has been shown increasing in importance, especially in Technology classes. The contemporary generations of students are more demanding on challenging learning experiences through dynamic participation and interaction during the teaching-learning process.

Student engagement has become a focus of attention as one approach to improving student success in both secondary and postsecondary education. Research showed people learn best when trying to do things that are challenging and of deep interest to them, reflecting the close interplay of the emotional in cognition and the development of capacity. School culture is one of the most complex and important concepts in education. In relation to school improvement, it has also been one of the most neglected. The basic essence of an organization's culture is the deeper level of basic assumptions and beliefs that are shared by members of an organization, that operate unconsciously, and that define in a basic 'taken-for-granted' fashion an organization's view of itself and its environment. These are the heart of school culture, and what makes it so hard to grasp and change (Gambrell, 2011). Students will be conformed to the existing standard process of delivery of instruction in relation to school culture.

However, looking at how Constructivism Learning Environment (CLE) plays its role between school culture and student engagement, students have the opportunity to interpret various realities and knowledge and improve their problem-solving skills. As a result, they will have the ability to deal with real-life situations more effectively (Al-Huneidi & Schreurs, 2013). A study conducted by Dagamak, et al., (2020) in Los Baños, Laguna, Philippines established that it was safe to assume that the adaptation of the 5E constructivist method to the teaching program engaged a variety of young Filipino students and potentially gave them new knowledge.

## 2. Literature Review

### 2.1 School Culture

The independent variable of this research focuses on school culture which is depicted by the indicators namely: professional values, emphasis on learning, collegiality, collaboration, and shared planning. *Professional values* refer to n the importance of the social institution of education and the need for school growth is grounded on pedagogical principles; *Emphasis on learning* refers to a learning community in which there is a commitment to professional growth and improved outcomes for students; *Collegiality* empowers teachers to exercise professional judgments through the development of supportive inter-personal relationship; *Collaboration* refers to the interaction between teachers in which information is shared on school operational matters including the instructional program; *Shared planning* refers to a collective process whereby a common vision of the school is actualized by logical planning (Tsang, 2009).

Culture is an important aspect of any institution and yet, it is difficult to find a single, unified definition of exactly what culture is. Organizational culture is a pattern of shared basic assumptions learned by a group as it solved its problems with external adaption and internal integration, which has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems. An organization's culture can be subdivided into three levels, artifacts, espoused beliefs and values, and basic underlying assumptions (Españo, 2017).

Also, in organizational culture, artifacts are easily observed in the physical spaces of the institution, the apparent behaviors of employees, and how work is organized and processed. Artifacts can be aligned with explicit knowledge within an organization. Espoused beliefs and values can be seen in the organization's stated vision, mission, and goals but also can be found in individual ideals, principles, and personal aspirations. This level of culture is expressed as explicit knowledge and also the more personal, unspoken tacit knowledge. The cultural level of basic underlying assumptions represents the unstated thoughts, feelings, and perceptions that influence decision-making actions and employee behavior (Gabriele & Caines, 2014).

Thus, this level of culture is the invisible dimension of an organization not easily or readily communicated and relates to tacit knowledge. In addition to these levels of culture within an institution, there also exists a collection of subcultures and micro-cultures that exist based on organizational hierarchy, and geographic location, or are defined by a common set of functions or tasks by a group of individuals (Hofstede et al., 1990). Each of these subcultures and micro-cultures can have its own artifacts, espoused beliefs, and underlying assumptions within the same institution. Organizational culture is one of the most difficult barriers to knowledge management success (McDermott & O'Dell, 2001).

Furthermore, higher education institutions are often structured by function or discipline that operate independently of each other with varying degrees of autonomy. They are also bureaucratic institutions with complex political systems that serve different interests of stakeholders. Inherently, as in the business environment, functional areas within many higher education institutions often fail to share knowledge that can lead it to the establishment of a higher standard of education.

Nonetheless, the fundamental underlying assumptions are different from prevailing, or strongly held values. They represent the underlying patterns of behavior that have become so engrained in the actions, attributes, and mental models of the population that they are taken for granted and there is little variation within a social unit. Primary to the basic underlying assumptions concerning research administration is the ideal of service and servant leadership. This is collectively reflected in the statements of the sample population. Agreeably, research administration is a profession because of the *"ideal of service to clients and stakeholders, in addition to possessing specialized knowledge, and observing to a code of ethics and principles the critical role research administrators play as servant leaders in the world of research itself. These basic underlying assumptions are critical and are at the center of knowledge management for organizations and professions"* (Gabriele & Caines, 2014).

A commitment to the ideal of learning through sharing information must be an underlying basic assumption of the profession and organization for any activity. Lacking this quality requires a paradigm shift in the mindset of the population and sweeping cultural change (Españo, 2017). At the heart of any culture are attitudes toward time and commonly accepted norms about how to spend it. Anyone who has observed classes in an inner-city high school can see immediately that many students' attitudes toward time differ markedly from their teachers' attitudes and from the assumptions about time embedded in the bloated curriculum. Adults feel a sense of urgency; students do not. Some of the students' attitudes can be attributed to adolescence, no doubt, and some of it to the influence of a culture of poverty wherein long-term planning is rare and delayed gratification almost non-existent (Gabriele & Caines, 2014).

Furthermore, organizational culture is rooted in relationships. What people talk about, how they talk about it, how often they talk. How much they trust each other, share with each other or forgive each other. What stories they tell each other, what heroes they extol, what virtues they praise. These things determine the patterns of behavior that become distinctive features of an organization. Organizational structures can increase or decrease the amount of connectivity and communication among the people in the building and between the people in the building and the outside world. If the moral purpose is important, it cannot be separated from relationships inside the organization to emphasize organizational cultures in schools and in successful businesses (Schein, 2016; Tsang, 2009).

## 2.2 Student Engagement

The dependent variable of the study is *Student Engagement* which is measured in terms of affective engagement, behavioral engagement, and cognitive engagement. *Affective engagement* refers to a student's feelings toward his school, learning, teachers, and peers; *Behavioral engagement* refers to engagement that includes observable student actions or participation while at school and is investigated through a student's positive conduct, effort, and participation (e.g., participation in extracurricular activities, attendance, and work habits; *Cognitive engagement* includes a student's perceptions and beliefs associated to school and learning (Hart et al., 2011).

Student engagement has been shown increasing in importance, especially in science class. The contemporary generations of students are more demanding on challenging learning experiences through dynamic participation and interaction during the teaching-learning process. Classroom engagement has been considered a contributory factor not only in uplifting academic achievement but also in the development of students' positive attitudes toward learning. Over the past several decades, a multitude of investigations has considered questions related to student engagement and several factors that affect and influence it (Hart et al., 2011).

To add, student engagement inside the classroom is key to unearthing the full potential of students. Student engagement directs students' spontaneous accumulation of knowledge especially when the type of engagement closely matches with high-level challenges and the skills they need to meet. Thus, students contribute to small group work is the intense and spontaneous involvement in learning enhances students to develop optimism in class. On the other hand, optimism is developed through engagement. When engagement experience directs students to feel that the learning is both enjoyable and will profit them in the future like the essence of scientific knowledge in daily living. Moreover, the impact of student engagement inside the science class does not just maximize student participation but also leads to students engaging in discussions that stimulate the mind of students to become curious and develop interest to learn the abstract concepts and principles of science that often make the subject uninteresting (Gambrell, 2011; Pappa, 2014).

Similarly, there is a significance of engagement in classrooms. They stressed that students engage in cognitively demanding work and display curiosity, desire to know more, and positive emotional responses to learning (Sursock & Smidt, 2010). In contrast, the research findings of revealed that for the contemporary generation of learners, poor engagement results in the declining interest of students and impediments to learning. The traditional form of teaching usually focuses only on discussion and limits student participation, demonstrating less opportunity for students to develop their diverse potential (Hart et al., 2011; Trowler, 2010).

In addition, to fully understand the role of engagement in student success, there is a need to understand greater consensus on what covers student engagement inside the classroom. The conceptualization of student engagement that has been suggested as most

useful contains three components: behavioral engagement, affective engagement, and cognitive engagement. Behavioral engagement is the student's participation in learning activities, including attentiveness, positive conduct or optimism, and school attendance. Students take risks when they are involved in classroom and extracurricular activities, such as positive classroom behaviors and the amount of time spent on homework. Some manifestation when students demonstrate behavioral engagement includes note-taking, consistent studying, being prepared for class, course effort, and attending class regularly (Jones, 2008; Pappa, 2014; Kraft & Dougherty, 2013).

Furthermore, when students come to class prepared, they likely become self-motivated and optimistic, they also have greater positive outcomes in academic performance and retention through teacher use facilitation of student discussion. Instructional student engagement enhances the optimism of students thus they join during class discussions. It also includes positive and negative emotions toward school, teachers, or academic activities. Students' optimism is also influenced by the high encouragement and support of the teacher inside the classroom. Students increase in emotional engagement when they feel a greater sense of relatedness with their peers and instructor and a greater sense of belonging to the classroom environment (Caldwell, 2011).

Nonetheless, another aspect: emotional engagement, affect students' disposition toward learning. It helps students to perceive relevant subjects, apply the learning in real life, make it interesting, and develop a desire to learn more. Teacher facilitation of student interest can be applied to increase cognitive engagement which refers to a self-regulated approach to learning and the use of meta-cognitive strategies. Teacher facilitation of student interest involves students' intellectual investment and effort to understand complex ideas and use thoughtful strategies. Examples of participation or interaction engagement include asking to clarify and correct questions to the instructor, having fun in class, participating in small group discussions or active and collaborative learning, and out-of-class contact with the instructor. Engagement of students does not just result in the increased academic achievement of students but also the school as a whole (Li & Lerner, 2013; Cinchez, et al., 2017).

In addition, the development of a positive perception of students towards active participation does not just encourage them to engage in activities inside the classroom but also made them support and involve in all school endeavors. Researchers have identified positive correlations between student engagement and school success (Cinchez et al., 2017). For instance, students who adhere to the school rules, avoid disruptive behaviors, and feel personally accepted and respected by others get better grades and aspire further education. Engagement is a growth-producing activity through which an individual allocates attention in active response to the environment. Engagement related to school activity (or student engagement) has become an important concept related to multiple educational outcomes (Russell & Slater, 2011; Sharkey & Weimer, 2003; Zepke & Leach, 2010).

Student engagement has been identified as a primary variable in understanding dropout, particularly as a gradual process operating in a student's life and influencing that final decision to withdraw. Numerous studies have linked student engagement with improved academic performance and it has repeatedly been demonstrated to be a robust predictor of achievement and behavior in schools (Hart et al., 2011). It has also been correlated with health compromises such as substance abuse, depression, suicidal tendencies, aggression, early sexual activity, and health-promoting like exercise, nutrition, and safe sex activities. An understanding of student engagement might help educators prevent deleterious outcomes and promote positive ones for at-risk students (Li & Lerner, 2012; Strait & Rivera, 2013).

More so, student engagement is a construct that resonates with most consumers of education, including students and parents, and presents an attractive focus for researchers and educators, in that compared to other predictors of academic success that are static, it is believed to be a malleable characteristic and therefore a more appropriate focus for interventions (Sharkey & Weimer, 2003). In addition, both the individual and the environment shape a student's level of engagement, thus, there are many factors in the school environment that may enhance it. Indeed, researchers have shown that effective interventions to promote student engagement and motivation also enhance the probability of high school completion. For these reasons, it can be viewed as an asset associated with positive student outcomes (Zepke & Leach, 2010).

Despite its apparent utility, student engagement remains a nebulous construct with researchers using ambiguous or inconsistent definitions resulting in equally nebulous measures (Hart, et al., 2011). Several recent reviews have focused on defining this meta-construct and setting the stage for future scholarship. These scholars suggest that student engagement in school is multi-dimensional and appears to overlap with several similar constructs. The proposed definition includes both indicators and facilitators. Each component is vital to a complete understanding of student engagement (Sharkey & Weimer, 2003).

Further, the teacher's use of differentiation refers to a diverse use of strategies to meet the individual learning need of students. The use of differentiation increases the student's feelings toward school, learning, teachers, and peers. The terms psychological and emotional engagement have also been used in the current literature to describe this construct. Behavioral engagement is also a factor in differentiated learning and it includes observable student actions or participation while at school and is investigated through a student's positive conduct, effort, and participation such as participation in extracurricular activities, attendance, and work habits. Historically, research has been focused primarily on this aspect of student engagement. Cognitive engagement includes a student's perceptions and beliefs associated with school and learning (Li & Lerner, 2012).

It refers to the cognitive processing a student brings to academic tasks as well as the amount and type of strategies a student utilizes. Some researchers propose the notion

of academic engagement as a fourth indicator of student engagement. The academic engagement has been defined as time spent in academic learning. We contend that academic engagement can be better explained as an aspect of one of the three more commonly identified indicators or as an outcome of student engagement. Whereas there seems to be a general consensus that three indicators of engagement exist, there still remain differences in precisely how these indicators are defined and measured. For example, locate motivation within the affective engagement indicator, and define this construct as a cognitive indicator of engagement, it is described as a cognitive precursor to engagement. Therefore, an obvious challenge remains for researchers of student engagement in parsing out the characteristics of each component (Kraft & Dougherty, 2013; Pappa, 2014).

## 2.3 Constructivist Learning Environment

The mediating variable is Constructivist Learning Environment. It is an approach to teaching and learning based on the premise that cognition (learning) is the result of "mental construction." In other words, students learn by fitting new information together with what they already know. Constructivists believe that learning is affected by the context in which an idea is taught as well as by students' beliefs and attitudes. A mediating variable is one that lies intermediate between causal factors and a final outcome. It further aims to estimate the way a variable affects the impact of X on Y. A mediator is presumed to cause the outcome and not vice versa. One reason for testing mediation is trying to understand the mechanism through which the initial variable affects the outcome (Baron & Kenny, 1986).

Constructivism, which is defined as the philosophical belief of individuals related to making sense of reality, comprises epistemological and pedagogical tenets. In other words, it is a philosophical approach and learning theory. According to the constructivist learning theory, learning is defined as an active process in which the individual constructs knowledge on her/his own by relating the obtained knowledge as a result of interacting with the environment and new knowledge (Driscoll, 2005). Literature that considers the constructivist viewpoint on learning emphasizes that actualizing constructivism in a real sense depends on the created learning environment (Gokalp & Kirbulut, 2013).

Fraser (1998) defines the learning environment as a social, psychological, and pedagogical context that affects the attitude and success of students and where learning occurs. On the other hand, a constructivist learning environment (CLE) is defined as an environment where learners generally support each other's learning and construct knowledge by using information resources and various tools to solve a problem or to reach their learning goals (Wilson, 1996; Tynjala, 1999). CLE is a student-centered environment (Brooks & Brooks, 1999). When the definitions related to CLE are taken into consideration, it can be stated that CLE is purposeful, contextual, interactive, cooperative,

complex, inductive, reflective, and active. Cunningham et al., (1993) determined seven principles that should be adhered to create a constructive learning environment.

Constructivism is an approach to teaching and learning based on the premise that cognition (learning) is the result of "mental construction." In other words, students learn by fitting new information together with what they already know. Constructivists believe that learning is affected by the context in which an idea is taught as well as by students' beliefs and attitudes. Constructivism is a learning theory found in psychology that explains how people might acquire knowledge and learn. It, therefore, has direct application to education. The theory suggests that humans construct knowledge and meaning from their experiences. Constructivism is not a specific pedagogy. Piaget's theory of Constructivist learning has had a wide-ranging impact on learning theories and teaching methods in education and is an underlying theme of many education reform movements. Research support for constructivist teaching techniques has been mixed, with some research supporting these techniques and other research contradicting those results (Uredi, 2013).

The history of constructivism in education and philosophy indicates that this is not a new theory. They cite the work of Vico (early 18th century), Rousseau (1760) and indicate that one of the greatest influences was John Dewey (1916, 1929, 1938) for his arguments against the educational framework of memorization and recitation and his push for new methods to meet the changing needs of the newly emerging industrial society. He argued that education is not a preparation for life, it is life itself (Tunca, 2015). The notion of a learning environment is somewhat new in the context of instructional design. The goal for instructional designers has been to create an instructional episode for the students, with measurable outcomes, that required the learners to interact in some way with the knowledge that was prescribed for them and transmitted to them either via a teacher or some other mechanism. The active participation of the learner in the learning process has become the basis for new directions for learning theories since the seventies. Models for instructional design, though many and varied, have one definite thing in common: they can be replicated over time in a number of instructional contexts. There is a focus on instructional sequences or a prescriptive set of activities or thoughts. Constructivism, with its focus on learning rather than instruction, challenges the instructional designer to look for new models, but it seems that by its very nature, constructivism defies the concept of a model.

Jonassen (1994) suggests in fact that it is not possible to create one since "*knowledge construction is context-specific.*" The difference he asserts is that rather than designing instructional sequences, the emphasis is on the design of a learning environment (Le Cornu, et al., 2003; Allard & Cooper, 2001). At the Primary level, teaching programs based on the constructivist approach have started to be implemented in Turkey since 2005-2006. It can be suggested that the situation required a need to train teachers that will have the qualities to employ these constructivist approach-based programs (Bay, 2008). Teaching programs applied in Turkey focus on active learning based on constructivist learning

theory whose main consideration is how students learn rather than what students should know and where the learner is placed in the centre of learning by guiding, leading, facilitating, organizing, and motivating teachers. Teachers constitute the most crucial factor in order for the program to meet these objectives (Bay, et al., 2010).

However, since, in Turkey, in 2005, curriculums based on the constructivist approach started to be implemented straightforwardly, teachers who were not educated according to the constructivist approach and did not have enough knowledge about the theory encountered a number of difficulties. About this new concept in Turkey, having the idea that we can prepare teachers by transferring knowledge based on the old paradigms poses another part of the problem. No matter how much information we give to teachers pre-service and in-service, unless they are trained and modeled within an approach that supports learning by participating, doing, and practicing, it is inevitable that after a while young teacher candidates and teachers will switch back to their old habits of the system in which they were taught. Therefore, creating a proper understanding requires more than presenting the approach in a few lessons (Tuncel & Bahtiyar, 2015).

With these discussions on constructivism, principles associated with CLE are the following: The first principle is that teachers provide experience with the knowledge-constructing process, which means making the learners gain experiences on how to construct knowledge. The second is for teachers to appreciate students' presentations of different points of view and their respect for different points of view. The third principle is to provide real and context-related learning, which means that students use the acquired knowledge in daily life in appropriate contexts. The fourth is to include students' active participation in the learning process. The fifth involves providing learning with social experiences. The sixth principle is to allow students to express themselves in various ways (Gokalp & Kirbulut, 2013).

The seventh principle is for teachers to increase students' own awareness of the learning strategies they use to construct knowledge and of problem-solving strategies. The CLE characteristics referred to by the measurement tool used in the present study are discussions and interviews, conceptual contradictions, sharing opinions with others, materials and sources aiming to lead to a conclusion, reflection, and motivation for the discovery of concepts, meeting the needs of the learners and creating meaning and correlating with the real-life situations (Fer & Cirik, 2006). According to Brooks and Brooks (1999), the role of the constructivist teacher is to encourage students to take initiative in subjects, such as by determining their own learning goals, creating an environment promoting critical thinking skills by asking high-level questions, and by asking students to construct conflicting hypotheses. Within this line of reasoning, it can be said that CLE develops students' high-level thinking skills such as critical thinking (Kwan & Wong, 2014).

In a separate article in this issue of The College Quarterly, Schultz addresses the apparent conflict between the student-centered approaches that arise out of constructivist

models of learning and societal demands for accountability that focus on *"predetermined curriculum and instructional plans."* I believe the ideas presented in this series of articles are consistent with the idea of *"pragmatic constructivism"* that Schultz regards as a resolution of the student-centered versus *"predetermined"* approach to instruction. At various points in the articles, the reader will find textboxes that provide specific suggestions for how to involve students as *"partners in education"*—a concept promoted by Healey et al. (2014) in a report for the United Kingdom's Higher Education Academy. Healey, et al. (2014) argued that all postsecondary education students should be engaged in active learning of this type.

A study conducted by Dagamac et al. (2020) in Los Baños, Laguna, Philippines concluded that it was safe to assume that the adaptation of the 5E constructivist method to the teaching program engaged a variety of young Filipino students and potentially gave them new knowledge about the unpopular biological organisms like the slime molds. Moreover, similar studies have shown that teachers like using the 5E methods in science (Fazelian et al., 2010; Ergin, 2012) and even in a math classroom (Tural et al., 2010; Tuna & Kacar, 2013). Hence, the constructivist nature of this innovative teaching program agrees with the educational principle that the sustained use of an effective, research-based instructional model can help students learn fundamental concepts in science and other domains (Halpern, 1998).

Teachers are aware that constructivist theory is the most effective approach to teaching science, then teachers should create a classroom atmosphere that promotes learning and allows the learner to be part of the process. Part of the classroom assessment of constructivist teachers is to encourage their students to assess their own progress in understanding the lesson (Bada, 2015). With this, the research is even more curious to know constructivism theory as mediating variable on the variables as TLE in focus. Since constructivism is based on own experiences and beliefs. Each person will have their own prior knowledge and experiences during their lifetime. Learners need to engage in the world so that they are actively involved in their own learning and development.

## 2.4 Correlation between Measures

Learning is a social and transactional process occurring between individuals, mediated through language and other cultural tools, in the context of a socio-historically influenced environment. Much of contemporary educational psychology has followed this constructivist tradition, highlighting the reciprocal, situated, and collaborative nature of learning within authentic contexts and learning communities (Cirik et al., 2015). If engagement with learning arises from the reciprocal interaction between learners and a learning environment as suggested by contemporary educational psychology, then teachers' potency to engage students may lie in their ability to create, shape, and influence the whole learning environment. Furthermore, this constructivist-based perspective would suggest that a holistic approach to studying engaging environments is needed (Friesen, 2010).

Dominated by surveys to measure individual constructs rather than characteristics of learning environments, research methods to investigate how learners become motivated and engaged in learning have lagged behind contemporary theory in educational psychology. This is only one of perhaps several reasons that research on learning environments, including social and relational classroom climates, has arguably not received due attention from researchers (Taylor & Fraser, 1991).

The social mix of the school plays a major role in how it functions, largely because of the cumulative effect of how the pupils relate to each other as a group. Essentially, pupils who attend the school flavor it in a particular way, through their own pupil culture. This takes on added significance when they reach adolescence and their identities and values are shifting. Engagement, in the student content engagement framework, refers to the form of cognitive interaction between the student and instructional content (Appleton et al., 2008).

Based on the above literature, the variables of the study are: student engagement and school culture. The readings and relevant studies are useful to the presentation of the study. The dependent variable is student engagement with indicators: affective engagement, behavioral engagement, and cognitive engagement. The independent variable is school culture with these indicators: professional values, emphasis on learning, collegiality, collaboration, and shared planning. These readings are valuable in determining the relationship between student engagement and school culture. The mediating variable is the constructivist learning environment. The Review of Related Literature will also be a basis for the presentation, results, and findings of the study.

## 3. Material and Methods

This study utilized correlational design employing mediating analysis. The correlation technique of research is designed to gather data, ideas, facts, and information related to the study. In non-experimental research, researchers gather data without making changes or introducing treatments. In this study, the variables will not be manipulated and the setting will not be controlled. Descriptive-correlation research design describes and interprets what is, and reveals conditions and relationships that exist and do not exist (Calderon, 2006; Calmorin, 2007; Gehle, 2013). It will also investigate the relationship between three variables- school culture, student engagement, and constructivist learning environment.

Intervening or mediating variables stand between the independent and dependent variables, and they mediate the effects of the independent variable on the dependent variable. The mediating variable, the organization of the study, stands between the independent and dependent variables in the probable causal link. Moderating variables are independent variables that affect the direction and/or the strength of the relationship between independent and dependent variables. These moderating variables are new

variables constructed by a researcher by taking one variable and multiplying it by another to determine the joint impact of both on the dependent variable (Creswell, 2014).

In general, the mediation model examines the relationship between the dependent variable and the independent variable, the relationship between the independent variable and the mediator variable, and the relationship between the dependent variable and the mediator variable (Creswell, 2014). The interest of the study is to investigate the relationship between student engagement and school culture, the relationship between school culture and constructivist learning environment, and the relationship between student engagement and constructivist learning environment.

This study was conducted in public secondary schools in the municipalities of Magsaysay, Bansalan, and Matanao (MABAMA), Davao del Sur. It is part of Region XI in the Philippines. Davao del Sur is located in the southeastern portion of Mindanao, encloses the Davao Gulf and its regional center is Davao City. Davao Region has eleven school divisions which Davao Del Sur province is part of and where Matanao is located, in which this study was conducted. The Municipality of Matanao is a second-class municipality.

The respondents of the study were public secondary Technology and Livelihood Education (TLE) students from both Junior high schools and Senior high schools in Matanao, Davao del Sur. A random sampling technique was used. A total of 400 officially enrolled TLE and TVL students aged 18 years old and above were included in the study. This study, however, was exclusive to minor students, those who are not official students of secondary schools, and students with no TLE subjects for the school year 2020-2021. Furthermore, this study did not include students who wished not to participate in the survey.

The study adopted three sets of questionnaires from different authors and contextualized them by the researcher. The questionnaire was taken from "Three Approaches to Understanding and Investigating the Concept of School Culture and School Culture Phenomena: Implications to School Improvement and School Effectiveness" authored by Kwok Kuen Tsang of City University of Hong Kong; "Students Engagement in School Questionnaire (SESQ) Teacher Engagement Report Form-New (TERF-N) Examining the Preliminary Evidence" authored by Hart, Stewart and Jimerson of University of California Santa Barbara; and "CLES: An Instrument for Assessing Constructivist Learning Environments" authored by Taylor and Fraser of Curtin of California Santa Barbara.

These were validated by experts on questionnaire modifications and constructions. The comments of the experts were properly taken and incorporated into the finalization of the instrument. The adapted standardized questionnaire was tested and proven by the author and has undergone some modifications in classifying the questions. The questionnaire was designed in a very comprehensive form with the help of expert validators to provide the respondents with ease and comfort in answering each question and in understanding the objective of the study. The questionnaires were

submitted to the research adviser for comments and suggestions. Upon approval, the instruments were validated by the experts. This was conducted on 30 respondents with a Cronbach's alpha reliability test result for the three scales; school culture- 0.961; student engagement- 0.949; and constructivist learning environment– 0.876. The overall rating of the instrument gives a descriptive rating of very good.

The five-point Likert scale is used for the research variables. The Likert Scale requires individuals to tick a box/blank in response to a large number of items concerning an attitude, object, and stimulus. It is common to treat the number obtained from a rating scale directly as measurements by calculating averages or more generally any arithmetic operations (Santos, 2007).

The data was gathered in a systematic procedure. The researcher asked permission to conduct the study. The researcher sent a letter asking permission to the Schools Division Superintendent of the Department of Education Division of Davao del Sur. When approved, the researcher also addressed the letters asking permission from the School Heads to conduct the research on their TLE students. Upon approval, the administration of the survey questionnaire was done. Survey questionnaires were administered to the public secondary school students in MABAMA, Davao del Sur. The researcher distributed the questionnaires to the respondents from different public secondary schools. All distributed questionnaires were retrieved after one week to give enough time for the respondents to accomplish the survey questionnaires. The researcher's thesis adviser also served as a secondary author for her constant supervision and guidance during and after the conduct of this study.

For a more comprehensive interpretation and analysis of the data, the mean was used to describe the level of constructivist learning environment, school culture, and student's engagement. Meanwhile, Pearson r was used to determine the significance of the relationship between school culture and constructivist learning environment, constructivist learning environment and student engagement, and school culture and student engagement, and regression were used to determine the coefficient as input to med graph. Moreover, the med graph using the Sobel z-test was used to prove the mediation and strengthen the results.

## 4. Results and Discussion

The results are presented in this portion following the objectives of the research. As presented first is the level of school culture, second, the level of constructivist learning environment, followed by the level of student engagement, then the correlation between the variables school culture and student engagement, school culture and constructivist learning environment, and constructivist learning environment and student engagement, and lastly, the significance of the mediating effect of constructivist learning environment on the relationship between school culture and student engagement in Technology and Livelihood Education.

The standard deviation in the three descriptive tables, Table 1, Table 2, and Table 3 ranged from 0.62 to 0.57 which is less than 1.0 as the typical standard deviation for a 5-point Likert Scale. This means that the ratings were close to the mean based on the provided questionnaires to the students as respondents. Baron and Kenny (1986) explained that if less than 1.0 the responses are consistent.

### 4.1 Level of School Culture

Presented in Table 1 is the level of school culture as perceived among TLE students. The results show that an overall mean score of 4.16 is described as *high*. The *high* level was rated by the respondents in most of the indicators. The level of school culture is expressed as explicit knowledge and also the more personal, unspoken tacit knowledge.

**Table 1:** Level of school culture

| Indicators | Mean | SD | Descriptive Level |
|---|---|---|---|
| Emphasis on Learning | 4.33 | .667 | Very High |
| Transformational Leadership | 4.20 | .670 | Very High |
| Collegiality | 4.18 | .682 | High |
| Professional Values | 4.16 | .651 | High |
| Collaboration | 4.07 | .692 | High |
| Shared Planning | 4.05 | .698 | High |
| **Overall** | **4.16** | **.623** | **High** |

Further, the result shows that school culture as perceived among TLE students is manifested most of the time. *Emphasis on Learning* was manifested at all times with a mean score of 4.33 or *very high*. *Transformational Leadership wa*s manifested at all times with a mean score of 4.20 or *very high*. *Collegiality* is manifested most of the time as it generated a mean score of 4.18 or high. *Professional values* was manifested most of the time with a mean score of 4.16 or high. *Collaboration* and Shared Planning were manifested most of the time with the mean score of 4.07 and 4.05 respectively that both means *high.*

### 4.2 Level of Constructivist Learning Environment

Shown in Table 2 were the results on the level of constructivist learning environment with an overall mean of 3.93 which was interpreted as *high*.

**Table 2:** Level of constructivist learning environment

| Indicator | Mean | SD | Descriptive Level |
|---|---|---|---|
| Negotiation | 3.99 | .823 | High |
| Prior Knowledge | 3.97 | .782 | High |
| Autonomy | 4.11 | .754 | High |
| Student-Centeredness | 3.97 | .786 | High |
| **Overall** | **4.01** | **.724** | **High** |

Based on the results provided by the respondents, the levels of the indicators of a constructivist learning environment were all interpreted as *high*. *Negotiation* has a mean of 3.99, *prior knowledge* has a mean of 3.97, *autonomy* has a mean of 4.11 and *student-centeredness* has a mean of 3.97. The results mean that all of the indicators were oftentimes manifested as perceived among TLE students in MABAMA.

## 4.3 Level of Student Engagement in TLE

The result was due to the very high rating provided by the respondents. This means that the respondents observe student engagement at all times. When it comes to *affective*, it had a mean score of 4.32 or *very high*, *behavioral* had mean score of 4.25 or *very high*, both indicators mean that they were observed at all times, and *cognitive* has a mean score of 4.14 which was interpreted as *high* or it was observed most of the time.

**Table 3:** Level of student engagement

| Indicator | Mean | SD | Descriptive Level |
|---|---|---|---|
| Affective | 4.32 | .604 | Very High |
| Behavioral | 4.25 | .590 | Very High |
| Cognitive | 4.14 | .667 | High |
| **Overall** | **4.24** | **.575** | **Very High** |

Presented in Table 3 was the mean score for the items of student engagement in TLE with an overall mean of 4.24 which was interpreted as *very high*.

## 4.4 The Correlation Matrix of the Variables

Depicted in Table 4 are the results of the relationship between the correlation matrix of the variables. After conducting an in-depth analysis, it could be shown that school culture and engagement of TLE students revealed a computed r-value of 0.597 with a p-value of 0.000 which is significant at a 0.05 level. Presented in Table 4 is the correlation between variables: school culture, student engagement, and constructivist learning environment. The correlation coefficient between school culture and student engagement is 0.843 with a p-value of 0.001 or significant. Thus, the null hypothesis that there is no significant relationship between school culture and student engagement was rejected.

**Table 4:** Correlation matrix of the variables

| Pair | Variables | Correlation Coefficient | *p*-value | Decision on Ho |
|---|---|---|---|---|
| IV at DV | School Culture and Student Engagement | 0.843 | <0.001 | Reject |
| IV at MV | School Culture and Constructivist Learning Environment | 0.825 | <0.001 | Reject |
| MV at DV | Constructivist Learning Environment and Student Engagement | 0.712 | <0.001 | Reject |

Furthermore, the correlation test between school culture and constructivist learning environment has an overall coefficient of 0.825 with a p-value of 0.001 which means it is significant, and thus again, the null hypothesis that there is no significant relationship between school culture and constructivist learning environment was rejected. On the mediating variable, which is a constructivist learning environment, when correlated with student engagement, it has a correlation coefficient of 0.712 with a p-value of 0.001 which indicates that the null hypotheses were rejected.

### 4.5 Regression Analysis Showing the Influence of School Culture on Student Engagement as Mediated by Constructivist Learning Environment

In analyzing the path analysis, there were steps taken such as, there were four steps involved in the path analysis. The first path shows the mediating effect of School Culture and Student Engagement, the second path shows the mediating effect of School Culture and Constructivist Learning Environment, and the third path shows the mediating effect of Constructivist Learning Environment and Student Engagement.

This table shows the regression analysis showing the influence of school culture on student engagement as mediated by a constructivist learning environment at a 0.01 level of significance. The results show Step 1 with $c$ path has a beta (unstandardized) value of 0.778 and beta (standardized) value of 0.843** ($p<0.01$); Step 2 with $a$ path has a beta (unstandardized) value of 0.827 and beta (standardized) value of 0.712** ($p<0.01$); Step 3 with $b$ path has a beta (unstandardized) value of 0.362 and beta (standardized) value of 0.456** ($p<0.01$); and Step 4 $c'$ path has a beta (unstandardized) value of 0.479 and beta (standardized) value of 0.519** ($p<0.01$) which rejects the null hypothesis since there is a coefficient change in the effect of the IV towards the DV from 0.778 changed to 0.479.

**Table 5:** Regression Analysis Showing the Influence of School Culture on
Student Engagement as Mediated by Constructivist Learning Environment

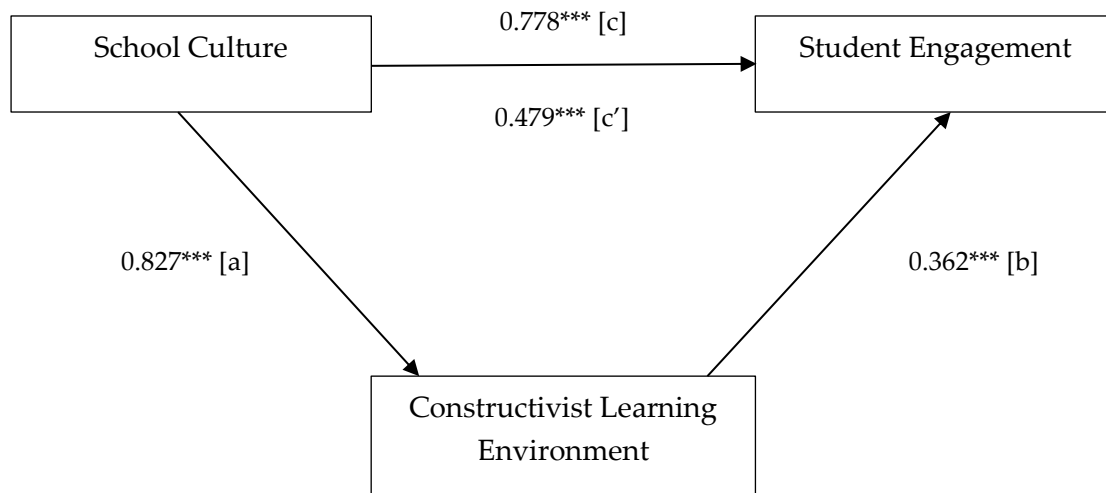| Step | Path | Beta (Unstandardized) | Standard Error | Beta (Standardized) |
|------|------|----------------------|----------------|---------------------|
| Step 1 | c | 0.778 | 0.025 | 0.843** |
| Step 2 | a | 0.827 | 0.041 | 0.712** |
| Step 3 | b | 0.362 | 0.024 | 0.456** |
| Step 4 | c' | 0.479 | 0.028 | 0.519** |

**Note:** **$p<0.01$

Thus, the overall school culture in student engagement in Technology and Livelihood Education as mediated by a constructivist learning environment is significant.

### 4.6 Mediating Effect: Path Analysis

Using Path Analysis, results show that paths School Culture to Student Engagement, School Culture to Constructivist Learning Environment, Constructivist Learning Environment to Student Engagement are significant with sign unchanged, hence, Constructivist Learning Environment partially mediates the relationship between School

Culture and Student Engagement in TLE. Figure 3 shows that for every unit increase in Constructivist Learning Environment there is a corresponding 38.46 increase. The results show Sobel z 11. 935719 (p<0.01) with the percentage of the total effect that is mediated to 38.463723% and its ratio of the indirect to direct effect is 0.625058.



**Figure 3**: Medgraph showing the variables of the study

**Mediation Analysis**
Sobel z = 11.935719, *p*<0.01**
Percentage of the total effect that is mediated = 38.463723%.
Ratio of the indirect to direct effect = 0.625058.

**Effect Size Measures**
Unstandardized Coefficients
Total: .778
Direct: .479
Indirect: .827
Ratio Index: 1.063

The aim of this study was to investigate the mediation of a constructivist learning environment on the relationship between school culture and student engagement. However, there is no full mediation of a constructivist learning environment between school culture and student engagement. Relevantly, these researchers explained the relationships between the variables, Appleton et al. (2008) suggested that student engagement may take the form of attending a lecture or discussion, comparing new information against prior understanding, rehearsing a set of facts, or attending only peripherally (or not at all) to the intended focus of instruction. In these examples, the

instructional content is the lecture or discussion, the new information, or the set of facts; engagement describes how the student and instructional content interact. Engagement describes the aspects of instructional content with which the student interacts and how, in cognitive terms, that interaction occurs. In sum, the term student content engagement establishes three categories into which all the influences on learning can be sorted—the student, instructional content, and the engagement of the two. While student content engagement leads to learning, student content engagement and learning are not synonymous.

Student content engagement occurs when its four conditions are successfully satisfied. However, the moment of actual processing cannot currently be measured. Therefore, we cannot be sure of what kind of processing is occurring. Also, we expect students to vary in how much and what kind of processing helps them to learn effectively (Gambrell, 2011*).

The mediation analysis involved the path between school culture and student engagement and the path between constructivist learning environment and student engagement. The findings confirmed the significant relationship between school culture and student engagement, supporting the results of the study of Piaget (1980) on constructivism which is a theory in education that considers learners to create innovative understandings and knowledge, integrating with what they already know. This includes information acquired prior to taking the new lesson and experiences as learners engage in different activities. As Lev Vygotsky's (1896-1934) escalates theory to social constructivism stressed the significance of sociocultural learning; how interactions with adults, more connected peers, and cognitive gears are adapted by learners to produce mental ideas through the [zone of proximal development](#).

According to Driscoll (2005), in the constructivist learning theory, learning is an active process in which the individual constructs knowledge on her/his own by relating the obtained knowledge as a result of interacting with the environment and new knowledge. Literature that considers the constructivist viewpoint on learning emphasizes that actualizing constructivism in a real sense depends on the created learning environment. Learning environment is a social, psychological, and pedagogical context that affects the attitude and success of students and where learning occurs. CLE is a student-centered environment (Brooks & Brooks, 1999). When the definitions related to CLE are taken into consideration, it can be stated that CLE is purposeful, contextual, interactive, cooperative, complex, inductive, reflective, and active. Cunningham, et al., (1993) determined seven principles that should be adhered to create a constructive learning environment (Honebein, 1998).

For student engagement in learning activities, Hart, et al. (2011) explained that student engagement is a complex construct that continues to be important in promoting positive outcomes for students. Challenges remain in the conceptualization and measurement of this construct. One question that persists is: should engagement be measured by its apparent components or should all types of engagement be lumped

together as one overarching construct? Researchers should focus on the areas of examining and measuring engagement in order to further refine measures and create interventions directly related to an individual student's needs.

## 5. Recommendations

Based on the findings and conclusions, the following recommendations are offered:

In school culture, it was found out in this study that *shared planning* got the lowest rating which means that the collective process whereby a common vision or goal in and of the school is actualized by logical planning can still be improved among TLE students in MABAMA. Organizational culture is a pattern of shared basic assumptions learned by a group as it solved its problems with external adaption and internal integration, which has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems. An organization's culture can be subdivided into three levels, artifacts, espoused beliefs and values, and basic underlying assumptions (Españo, 2017).

In the constructivist learning environment, the indicators that got the lowest rating are prior knowledge and student-centeredness. It implies that during the teachers' trainings and seminars prior knowledge of pedagogy and trends in TLE teaching can be added as input. School officials and administrators are also encouraged to contribute to the improvement of student engagement, particularly in the cognitive aspect of the learners. Cognitive engagement includes a student's perceptions and beliefs associated with school and learning. For instance, students may be engaged in discussions and forums on relevant social issues such as digital literacy, online ethics, the latest innovations, and trainings about technology and livelihood education and other allied fields of TLE. It can be done when school activities and projects motivate the students and relate these with learning linked with the pedagogies of TLE.

Further, school culture has a significant influence on student engagement, it is therefore also recommended that further researches may be conducted on topics relating to the abovementioned variables by exploring other variables not investigated in this study.

Future researchers may also utilize other forms or formats of questionnaires on school culture and student engagement. Future researchers' studies may also include other heterogeneous groups in other localities.

## 6. Conclusion

The level of school culture as perceived among TLE students in MABAMA is *high* as well as their constructivist learning environment. To add, student engagement in TLE in MABAMA is found to be *very high*. The study also found out that the level of constructivist learning environment is high which implies that students have high ratings

for their constructivist learning environment which is an environment where psychological and pedagogical context affects the attitude and success of students and where learning occurs. The findings of this study also reaffirm the theory of Piaget (1980) on Constructivism. The theory considers learners to create innovative understandings and knowledge, integrating with what they already know. This includes information acquired prior to taking the new lesson and experiences as learners engage in different activities. Moreover, the study also supports the proposition of Driscoll (2005), that constructivist learning theory, is learning with an active process in which the individual constructs knowledge on her/his own by relating the obtained knowledge as a result of interacting with the environment and new knowledge. Constructivism in a real sense depends on the created learning environment.

## Acknowledgments

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Eva Lyn M. Lagrimas, Viola P. Buenaventura
THE MEDIATING EFFECT OF CONSTRUCTIVIST LEARNING ENVIRONMENT
ON THE RELATIONSHIP BETWEEN SCHOOL CULTURE AND STUDENT
ENGAGEMENT IN TECHNOLOGY AND LIVELIHOOD EDUCATION