EXPERIENTIAL LEARNING AND UNDERGRADUATE RESEARCH

An Undergraduate Research Scholars Thesis

by

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ABSTRACT

Experiential Learning and Undergraduate Research

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The purpose of this mixed-methods study is to describe the learning environments and students involved in a sequence of undergraduate research. Qualitative and quantitative data were collected in a previous study from students in a sequence of two courses, one in a traditional classroom setting and the other as a field experience in the western U.S. Bandura's (1986) social cognitive theory was used to understand the relationship between students, their behavior, and different learning environments. Face-to-face interviews, observations, and journals were used as sources of data to understand students' critical thinking ability and learning styles before and after the overall experience.

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CHAPTER I

INTRODUCTION

Our purpose in this study

Research? That was question poised in all minds when this journey began. In all honesty, not one of us expected to write a thesis. Research was not originally what sparked our interest. At the very beginning of our journey, we expected only a trip to the west coast and a replacement course for our dreaded statistics credit. Along the way, our focus and course of action evolved more times than we can even recall. The original project involved a universal model of engagement to be presented before clientele.

Our research course, designed to give little direction and maximize our critical thinking skills, erupted into a time of personal reflection, a desperate search for the components behind our engagement and our disengagement.

As students in the research class, we initially pursued the definition of universal engagement. To only find that, throughout the process, we were not fully engaged. Not only were we as college students attempting to understand what factors did or did not keep us engaged, but we also, throughout our research, sought to understand how large a role engagement played inside of the classroom.

For students to grasp and understand the concepts being taught in a classroom, they must be engaged. We believe having a degree of optimism, curiosity, passion and attention constitutes as

engagement. The theory of engagement holds meaning to our team because in today's scholastic society, schools have created a short-term solution to a long-term issue. Classroom material is theory-based, and in lacking a hands-on component with classes, students memorize material only to forget the information as soon as the school year is over. Learning has become the task of figuring out answers for exams—students find little intrinsic value in applying theories to their lives. Now, the answers matter more than the reasons behind them.

Engagement in the classroom

The term ''engagement'' has been used in a variety of academic disciplines including sociology, political science, psychology, and organizational behavior in the last decade (Achterberg et al. 2003; Resnick 2001; Saks 2006). Engaging students in the learning process is a widely discussed topic in educational literature, especially in the areas of educational psychology and instructional design; many of these studies have placed considerable focus on conditions and environments believed to increase student engagement. John Dewey (1938) argued teaching and learning were social and interactive processes that thrive when students are allowed to interact with the world around them. Understanding learning environments may provide insight into levels of student engagement.

The concept of scholastic engagement has attracted interest with the increasing levels of student boredom, and a steadily rising dropout rate (Fredricks, Blumenfeld, & Paris, 2004). Literature pointedly states that student performance is directly related to student engagement (Carini et al., 2006). Research reflects that all students care about is the grade after the class, getting the grade with the littlest amount of effort, and requiring the least amount of motivation (Fredricks et al., 2004). Students are becoming their own distraction, the way to improve the motivation and

engagement of the students is the classroom design. The classroom must gain attention, maintain attention, and provide long term attention (Bilda et al., 2008). Student outcomes in the class are directly related to the type of engagement the student possesses (Carini et al., 2006). Prior research shows there are three types of engagement 1) behavioral; directly related to the students actions 2) emotional; the positive or negative relationship to the teachers 3) cognitive; is the amount of investment from the student (Fredricks et al., 2004).

Designing the class, however simple that may seem, is the most complex component. Teachers must attract, sustain, and relate to their students now more than ever (Bilda et al., 2008) and in such a way that students do not become alienated entirely (Fredricks et al., 2004). Repeatedly found in higher education it is important to design a classroom that plays to the students' strengths (Baylis, 2004). Designing the classroom by mixing students by age, experience, gender, can increase the student engagement (Carini et al., 2006). The "flow," of the classroom can play a drastic toll on the students' engagement as well. They say that the level of engagement and motivation is directly related to the happiness level of the classroom experience (Kristjánsson, 2012). It has been said that students are accustomed to being pushed into action by the posters placed on the classroom wall (Lickona, 1991). An argument against this theory claims it is "psychologically naive" to believe that students are engaged and impacted by what is physically on the wall (Peterson, 2006, p.284), and a shallow attempt on behalf of the teachers to engage students. The way to connect with the students in the classroom is having educator caring beyond the classroom (Lickona, 1991). In the fast pace of today's education system, educators must understand that motivation goes deeper than the physical appearance of the classroom, the design of the class, and the classroom experience. Primarily, investing in students' psychological welfare before test results gives an excellent start in the right direction.

Dewey (1897) and Knowles (2011) believed education occurred when teachers understood students as psychological beings, a belief held since the writings of Plato. Plato's inquiry into the relationship between mind and body was continued by Aristotle, among others, into the understanding of modern psychology and the tripartite brain consisting of three parts: cognition, affection, and volition (Zimmerman, 2000). Bloom (1956) classified domains into levels of thought to understand learning: factual knowledge; conceptual knowledge; procedural knowledge; and metacognitive knowledge (Bloom, 1956; Anderson & Krathwohl, 2001). If teachers understand students psychologically, they may deliver instruction that engages students in different ways.

Dewey also suggested a balanced educational structure delivered knowledge while taking into account the prior interests and experiences of the individual student (Dewey, 1916). He noted that "the child and the curriculum are simply two points that define a straight line; the present standpoint of the child and the facts and truths of studies define instruction," (Dewey, 1938, p. 16). The diverse background experiences students bring to the learning process may provide valuable content for learning while increasing student engagement.

For the sake of our research, a person's "background" included their training, education, and life experiences. Using a person's background as a cornerstone to student engagement, we reflected on past experiences to discover relationships between why a student behaves in certain manners and their engagement. Research has been conducted to examine the relationships between behaviors, including: stress and life satisfaction, emotional intelligence and stress, as well as emotional intelligence and life satisfaction (Holinika, 2015). Bandura (1997) argues that in order for a person to enact a certain behavior, one must have the "self-efficacy" to do so. Self-efficacy

is formed through varying experiences, including mastery experience, which is based on intuition, and vicarious experience, which is a collection of a person's observations. Understanding a person's background and behaviors can help to understand how to engage people on an individual level.

If the purpose of learning is to become self-sufficient and intellectually mature, the practice of imparting or facilitating knowledge and skills is essential to the process of self-actualization. Arguably, the simplest way to define learning is change; a change in knowledge, a change in behavior as a process, function, and product of experience (Cronbach, 1963). The construction of knowledge and subsequent change in behavior would insinuate the strong connections between the process of learning and the brain.

Critical thinking involves the ability to evaluate claims on the basis of evidence so that a sound conclusion can be drawn (Bensley, 1998). A higher level of reasoning and comprehension is fostered by critical thinking (Weinstein, 1995), which provides ways to probe questions through expanding the horizons of possible solutions, or ways to challenge presuppositions (Jiang, 2013). Research has been conducted to study the importance of critical thinking and its effect one's thinking ability, intelligence, memory (Ticuşan, 2014) and also creativity (Jiang, 2013). Developing an understanding of a person's critical thinking is essential because critical thinking is central to psychology as it lies at the junction of the discipline's emphasis on scientific methods and its seminal content domain—that is, the study of how human beings think (Myers, 2006).

In 1971, Kolb introduced a theoretical framework for describing individual differences in learning behavior and developed the Learning Style Inventory (LSI) to assess the individual learning style preferences proposed by the theory. Kolb (1976) developed the original Learning Style Inventory (LSI) to (a) measure individuals' predominant learning style and (b) indicate the extent to which individuals emphasize action over reflection. Application of learning style theories has become a popular strategy for improving the education of college students and is consistent with the student affairs profession's goal of responding to individual educational needs (American College Personnel Association, 1996). Over the years, scholars have developed various theories to describe the observed differences among students' approaches to learning. Frequently noted works include Gardner's (1993) multiple intelligences, Kolb's (1981, 1984) learning styles, Gregorc's (1982) cognitive style differences, and various extensions of Jung's (1921, 1971) psychological types (Lawrence, 1993). A common thread in all these theories is the assumption that learning style is a stable and predictable characteristic (Salter).

Personality is the set of psychological traits and mechanisms within the individual that are organized and relatively enduring and that influence his or her interactions with, and adaptations to, the intrapsychic, physical, and social environments (Larsen & Buss, 2005, p. 4). Jung (1928), in his theory of psychological types, suggested seemingly random human behavior is actually quite consistent and orderly and can be understood through basic differences in the use of individual perception and judgment (Myers, 1962).

Theoretical framework

Bandura's (1986) social cognitive theory integrates multiple theories to provide a model of the many influences on learning. A vital component of SCT is triadic and reciprocal determinism, or

a person's behavior, environment, and personal qualities all reciprocally influence each other. The determinants of SCT (personal [P], environmental [E], and behavioral [B]; see Figure 2) can be used to examine personal characteristics (background, experience, learning style), behaviors (personality, change in motivation, interactions), and the environment (geographic location, proximity from the traditional classroom, duration of new experience). For this study, we used SCT to understand the personal characteristics of students and the sociological effects of environment on learning.

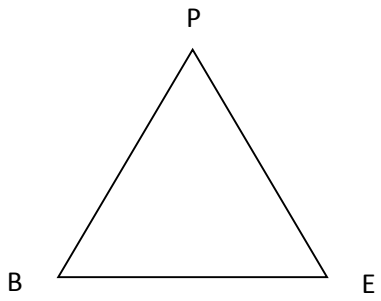

Figure 1. Bandura's (1986) social cognitive theory

CHAPTER II

METHODS

Conceptual framework

The purpose of this study was to understand the effect of depth of experience and sequence of experience on student engagement in an undergraduate research course. We drew on the theoretical framework of Bandura's social cognitive theory to guide our conceptual framework, using the terms personality, behavior and environment in tandem with our instrumentation. Based on social cognitive theory there is a trigonal, reciprocal relationship between personality (P), behavior (B), and environment (E).

P + E = B

Figure 2. Our conceptualization of SCT

Using the formula, noted in Figure 3, we measured the personal determinate of each individual participating in the class. Using their personality type, learning style, and the critical thinking assessment to determine measurable but still personal determinants, we sought to answer our two research questions: 1) Does depth of experience change student engagement; and 2) Does sequence of experience change student engagement?

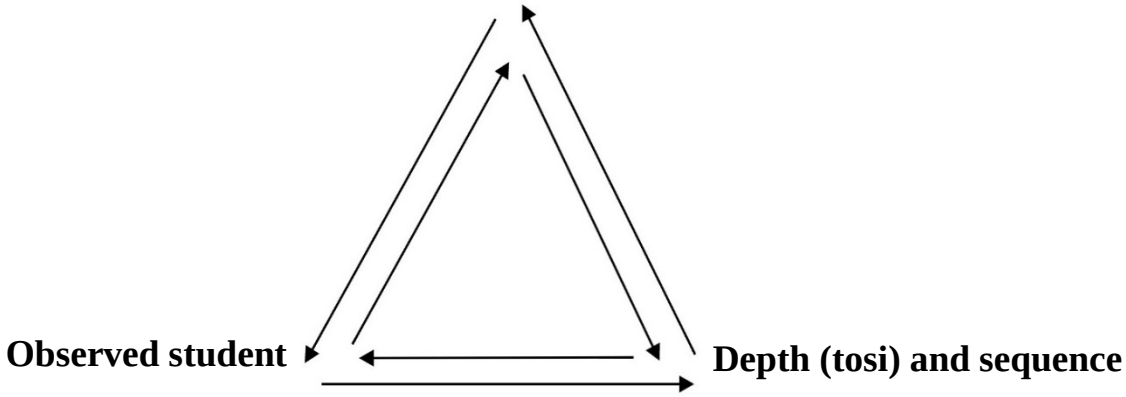

Figure 3. Relationship between the student, his/her background, and sequence

Our variables within the equation were narrowed to that of behavior—by creating a quantifiable way of measuring personality and using known environments experienced in other classes by previous students, behavior was effectively turned into our only variable.

Understanding the relationship of personality and environment, together, better help us understand the missing component, which is the behavior of the individual that participated in this. Therefore, the outcome of this study was to develop a deeper understanding of students' behavior in relationship to their level of engagement. First, we described the personal characteristics of all the individuals that participated in this study. Then we divided data into groups of individuals, which enabled us to describe their personality types, learning styles, ability to think critically, and demographic characteristics. Throughout the process, we sought to describe engagement in differing sequence and compare engagement by those sequences.

Class structure

This study of engagement is based on of the experiences and observations of two cohorts, with two classes in each cohort. The cohorts are divided into Cohort 1 and Cohort 2, and then subdivided into Cohort 1A, 1B; 2A and 2B. Cohort 1 consists of two research classes, both taking place in the spring semester and summer of 2015 (January of 2015 - June 2015). Differences separating Cohort 1 a and Cohort 1B were that 1A continued their research studies in a study away program along the West Coast during summer session I. Cohort 1B did not participate in the study away, and acted as a control group. The schedule for Cohort 2 opposed that of the spring semester, as Cohort 2A participated in the study away during the second summer session and then continued on, with Cohort 2B (our control group who had not taken the field experience), into the class following fall semester. The design of the class began as a case study to observe how the order and intensity of student learning affects the productivity and engagement of students. Cohort 1A learned in the order of theory, observation, simulation and immersion, while Cohort 1B only went through the theory, observation, and simulation phases (see Figure 4).

Cohort 2A went through the steps in reverse, in an order that is considered to be “adult learning” and opposite of typical classroom learning (see Figure 3). They were immersed in the study away experience and then went backwards through the immersion, simulation, observation and theory steps of the learning process. Cohort 2B did not participate in the immersion step of the study away. Despite the differences in sequence between the cohorts, the overall curricula and conceptual work were the same. The students received little instruction and guidance from the professors with assignments in hopes to spark higher levels of critical thinking. The main topic

of research for all cohort segments was engagement, and the approach to understanding that concept was—and still is—constantly evolving.

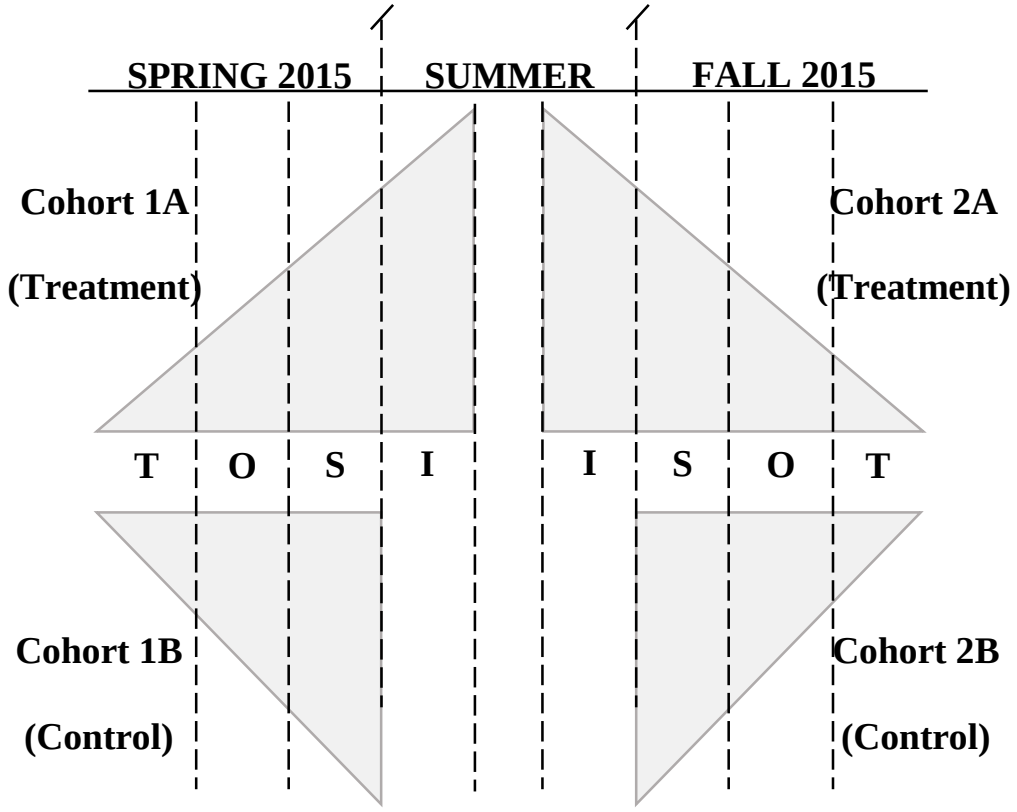

Figure 4. Operational Model of Sequenced Instruction & Class.

Participant characteristics

Forty-two participants were included in this study, of which 36 were female and 6 were male. At the time data were collected, participants were currently enrolled in the College of Agriculture and Life Sciences. A majority (n = 36) of the students were majoring in agricultural communications; two were agricultural science majors, one was an agricultural leadership major, and two were double majors in animal science and agricultural communications, and one students was pursuing double degrees in Animal Science and Agricultural Leadership. Ages of

the students ranged from 18 – 25. The goal of these undergraduate classes throughout the 2015 academic school year was to engage the students in higher levels of critical thinking, and to encourage students to push for researched arguments that were cohesive and convincing.

Students were required to write in Black 'n' Red™ notebooks, by Mead, and sketchbooks. Students were expected to separate thoughts into "*facts*" and "*opinions*" inside of either book, to make them aware of possible bias from their arguments. The class started with theoretical work (T), using models to explain dynamic ways of thinking used throughout the course of the semester to inform the students about engagement, how to define engagement , and ways engagement could be increased or decreased.

In cohorts 1 A and 1 B, professors used vague pieces of information to show the students what was expected of them in the class, the students were expected to be forced to arrive at conclusions and justify or defend those conclusions as the semester progressed. This was how the child-learning method, or TOSI, worked. The adult learning method, or ISOT, worked in a backwards method that introduced immersion firsthand (see Figure 4).

Cohort 1 was able to have a shared experience between both Cohort 1 A and 1 B, in the form of a data collection trial. Students collected random, sampled data by asking survey participants to take a 10 minute survey over a three day period on both the weekend of spring break and the week after spring break of 2015.

Students in Cohort 2 experienced engagement using the Texas A&M AgriLife Extension services. The Extension services, in an attempt to understand how to best recruit the Millennial generation, hired Cohort 2 to interview new employees in the organization.

Coding

The coding process of the Red N Blacks and sketchbooks involved two extensive rounds. In our first round of coding we went through all of the journals and looked for quotes that involved or discussed specific environments and behaviors, or gave indication of personality of the student. We chose to look for those three things based on banduras theoretical framework. We created three codes: “P” for personality “B” for behavior and ‘E” for environment. Students were assigned a number in order of cohorts and then alphabetically. While reading through student’s journals, we marked the letter for the corresponding code directly in the student’s journal while also making notes of the code, the quote, the page number, the student number. After our first round of coding, we read through and looked for themes and repetition within cohorts and then made comparisons between cohorts. Once themes were established that corresponded to our research questions, we began our second round. In our second of coding we went back through the journals and separated our codes into the themes we established. This allowed us to add and eliminate codes that did or did not fit into our themes and answered our research questions. From there, quotes were typed out and organized by themes and references were added. Our references consisted of “SKB” or “RNB” denoting sketchbook or Red N Black followed by the students assigned number and then the page number.

CHAPTER III

FINDINGS

Our findings do not serve the purpose of creating any new theories or discovering any new concepts. Instead, we hope these findings will provide clarity for the relationship between personality, environment and behavior by taking observations and concrete experiences to build upon pre-existing theoretical ideas.

An overview of findings for depth

Overall, we found that student engagement increased as depth of experience increased. As a whole, students were more reflective of their experiences and engaged in classroom concepts. This finding is based on our observations of both the quality and quantity of student's daily reflections when depth of experiences for that day exceeded beyond the theory phase. *"Hands-on equals a more memorable task than if it had been otherwise."* (RNB, 01, page 9). After studying cohorts 1A and 1B, we found 1A was most engaged in the immersion phase. This is evidenced by frequented journal entries that contained themes of understanding during the planned field experience over the 2015 summer.

> *"I now see the relationship between our research and the things that went on in the class/trip."* (RNB, 03, 82).
>
> *"I've learned so much about myself… This experience will be in my memories forever… My only regret is that I should have done this sooner in my college career."* (SKB, 05, page 59).

1B's maximum level of engagement was simulation—we found that this was where the peak of engagement rested. Their excitement, and their time focused in reflection was highest at this level of depth.

> *"I especially liked working at [the simulation phase]…great group experience."* (RNB,14, page 43).
>
> *"I did learn a lot from this [simulation]. I learned more about research than I thought I would… I really liked being forced out of my comfort zone to talk to people."* (RNB, 12, page 45).

We made the observation that cohort 1A was most engaged in the field experience and 1B in simulation. 1B, the control group, did not participate in the field study. Therefore, their highest level of perceived engagement was simulation. After 1B hit their peak level of depth, they went back to a classroom setting (theory) and at that point we found that engagement decreased. This finding was based on multiple excerpts from journals of students in 1B:

> *"I made [the simulation] a competition, and loved going around and getting data. Then we came back to [class]… after that I could have cared less."* (RNB, 18, page 43)

We concluded that level of engagement is relative to the maximum level of depth experienced. Because cohort 1A and 1B had interactions with each other working on the same projects and assignments, the lack of engagement among cohort 1B after the completion of their simulation

phase could be due to the fact that their peak in depth already occurred, while 1A was still anticipating their peak, the field experience.

> *"I'm not going to California… what's in it for me?"* (RNB, 22, page 66).
>
> *"Honestly this project is not very important to me because I'm not doing the summer trip."* (RNB, 17, 78)

Differences in the engagement of 2A and 2B in regards to depth lacked clarity. 2B had varying levels of engagement throughout, and their peak levels of reflection occurred at varying points throughout the fall semester. There was not a significant connection between levels of depth and engagement as a whole in cohort 2 as found in cohort 1. This finding could be better explained by our second factor, which is sequence.

An overview of findings for sequence

The sequence of experience between cohorts 1 and 2, changed because of the TOSI and ISOT sequence. Cohort 1, the TOSI sequence, exhibited more fluctuation, with visible high peaks of engagement throughout the entire sequence. Cohort 2, ISOT exhibited more consistent levels of engagement, and a higher level of stability seen in reflections. However, prior to reaching their stagnant level of engagement, cohort 2 has a period of disengagement at the beginning of their sequence in the immersion phase. Based on student's reflections, this could be do the fact that cohort one had not yet received any theory and therefore began with no point of reference.

> *"My brain is melting…we began with everything and we need to make a method that is narrow. Cohort 1 brought everything and began with nothing*." (RNB, 27, 60).

2A took less time to reach understanding in the theory phase because of experiences that acted as a foundation for knowledge and learning—however, 2B experienced demotivating obstacles in class because they did not start out with experiences, and lacked that point of reference at the beginning of the class.

"*Only the people who took this in the summer have a clue.*" (RNB, 37, 14)

As found cohort 1, the field experience created a division among cohort 2 as well. However the severity of the division was far greater in cohort 2 because of the change in sequence. Following the ISOT sequence, cohort 2A, and 2B began the fall semester with completely different levels of experience. 2A had already been immersed in the field experience prior to the class and we found that to be an area of demotivation for cohort 2b based on student reflections.

"*I feel so out of this conversation! STOP talking about the trip*." (RNB, 40).

Sequence did not appear to be as crucial among cohort 1 because both 1A and 1B followed the same sequence with the only difference being that cohort 1A completed the entire sequence and 1B did not.

CHAPTER IV

CONCLUSIONS

Although engagement can be a dark and scary concept for some students, the implications of the findings we presented provide some clarity. In our research it all started with an immersive experience. Experience alone is an exciting and seems as a new adventure but it turns out experience will be the best way to teach. The experience can be at the start of the process or at the end, the choice depends on what is the goal of the process. Engagement will always be greater during the experience, because experience provides a new and exciting setting.

If the experience is at the beginning the students will have a better chance of having information to relate back to, providing a higher level of engagement throughout the course. Providing a peak of information that all students experience. In the teacher's perspective this would be a classroom that all students seem to be interacting and constantly engaged. The only downside would be that there would be no spike in levels of engagement during the course because the students already reached their highest level of engagement.

If the experience is at the end of the process then the students would have something to look forward to. In the teacher's perspective this would be a classroom that all students seem to be struggling and fighting to find the answers. Then there would be a peak in engagement during the experience, the light bulbs will finally go off. The outcome will resemble the one of the experience at the beginning but with the peak of interest and engagement at the end of the process.

In our research, engagement level was relative to the maximum level of experience. Therefore, students may be more engaged if there are additional immersive experiences in the classroom. We understand that this is just a sliver of information that involves engagement, but engagement is ever evolving. This research provided clarity for us, but by no means solved the problem with engagement.

Education will never become unnecessary, therefore this research is crucial to the improvement of engagement in the classroom. By observing and making note of the actual thoughts of the students in our research it was very easy to measure their level of engagement by what they write down. By what thought is going through their mind while actions are happening in the classroom. Is it related to the class? Are they questioning their opinions? Are they off task? We can agree that this research can benefit most classroom settings.

For future research there still is the need for better instruments to help measure engagement. As the research develops the need to provide better and more accurate instruments is critical to the future of this research. For example, current instruments can measure critical thinking but if you are not already thinking critically before taking the test you will not be measure correctly for critical thinking because you are not actually thinking critically.

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