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# Meaningful and Interactive Learning Experiences Provided Through a Learning Management System: An Action Research Study in Ninth Grade Advanced Placement Human Geography

Daniel Robert Plonski

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MEANINGFUL AND INTERACTIVE LEARNING EXPERIENCES  
PROVIDED THROUGH A LEARNING MANAGEMENT SYSTEM:  
AN ACTION RESEARCH STUDY IN NINTH GRADE ADVANCED  
PLACEMENT HUMAN GEOGRAPHY

by

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## ABSTRACT

The purpose of this mixed methods action research was to determine if increased interactive Schoology-based modules could alter learner perceptions concerning the lack of meaningful learning (learner-instructor, learner-learner, learner-content) in the culture unit of instruction in an Advanced Placement Human Geography (APHG) classroom. A series of instructional modules were facilitated through the learning management system (LMS) Schoology to students ( $n = 16$ ) in APHG at a southeastern U.S. high school. The interactions were designed to enhance interaction based upon the criteria provided by Piaget's (1981) social constructivist theory, specifically Moore and Kearsley's (2011) systems approach and Miyazoe and Anderson's (2010) interactive equivalency theorem. These approaches sought to create meaningful interactions as described in Vygotsky's (1978) zone of proximal development.

This study addressed four research questions: (1) What are learners' perceptions of the learner-instructor, learner-learner, and learner-content interactions presented via the Schoology interactive modules in their culture unit of instruction? (2) What barriers are reported by students that hinder meaningful learner-instructor, learner-learner, and learner-content learning while using Schoology? (3) Do students' perceptions change after receiving increased interactive lessons presented through the Schoology interactive modules? (4) To what extent does student learning, as measured by a culture unit assessment, increase or decrease after the LMS driven instructional innovation?

As a mixed methods study, quantitative and qualitative information, namely pre- and post surveys, panel group discussions, and interviews, served as the basis of the evaluation. Results indicated significant variances in the pre- and postsurvey as well as significant improvement from the pre- to posttest. Overall, significant differences were found in the general interactivity, learner-instructor, learner-content, and learner-learner subscales. This signifies that the interactivity in the teacher-created modules was interactive. Limitations such as the novelty effect and the non-generalizability of the results exist in the study.

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## LIST OF ABBREVIATIONS

AP .....	Advanced Placement
APHG .....	Advanced Placement Human Geography
IET .....	Interactive Equivalence Theory
LMS .....	Learning Management System
SHS .....	Springdale High School
ZPD .....	Zone of Proximal Development

## CHAPTER 1: INTRODUCTION

### **National Context**

According to Sauers and McLeod (2018), high schools across the United States are adopting one computer to every student plans. The number of learners with access or even temporary ownership of personal computers, such as the Apple MacBook Air laptop computers provided to students at a southeastern U.S. high school studied in this report, has grown exponentially.

Previous published studies have focused on the increased numbers of high schools adding computer technology to the traditional classroom; however, the actual utility of the computers in producing educational results is lacking (Stone, 2017). Stone explained that learners' interactions are increased through the adoption of one-to-one technology in classrooms. Other studies support the increase in computers in Advanced Placement (AP) classes (Lanegran & Zeigler, 2016). Research shows the high worth of AP courses that include interactions such as those offered through a learning management system (LMS) like Schoology e.g., (Elmhurst University, 2019).

According to Sayfour in 2016, students reported significant advantages when using an LMS to facilitate the learner-instructor, learner-learner, and learner-content interactions that they perceived were helpful in learning. For example, students reported a significant increase in their ability to manage time in courses that utilize an LMS (Uzir, Gašević, Matcha, Jovanović, & Pardo, 2020). In another example, students reported increased feedback and increased productive criticism when their work was evaluated by

an instructor using an LMS platform over traditional grades and paper commentary (Laflen & Smith, 2017). Therefore, the use of an LMS can support different types of interactions that support learning.

### **Local Context**

This research took place at a southeastern high school which is anonymized in this report as Springdale High School (SHS). Additionally, all references and citations which could be used as identifiers have been removed. This mixed methods research study of a ninth grade Advanced Placement Human Geography (APHG) class explores the interactions between learners with the instructor, learners with other learners, and learners with the course content provided through lessons posted to Schoology.

Traditionally, APHG instruction takes place with limited usage of one-to-one technology or an LMS such as Schoology; however, the Covid-19 pandemic closed Springdale High School (Lanegran & Zeigler, 2016). This required learners to be instructed via the interactions provided through Schoology. In evaluating learner perceptions of the interactions provided via Schoology, especially how learners felt that the interactions provided meaningful learning opportunities, an insight into the utility of lessons that rely on the interactions possible through LMSs, such as Schoology, was gained.

Springdale High School is a 9-12 school located inside the urban city of Springdale in a southeastern U.S. state. The school's enrollment in 2021-2022 was 2,004 students, with 22.9% of that population being served as a part of a gifted and talented program. The school's population is 49% African American, 35% white, and 8% Latino (U.S. News, 2021). In 2012 the school adopted a one-to-one laptop computer program,

and as of 2021 100% of students had a laptop with a Schoology account, the LMS in use at the school since 2016.

According to U.S. News, in 2020, 32% of the student population took at least one AP course. In the 2021-2022 school year, 51 students took APHG, the course in which I serve as instructor. Placement in this course is based upon test-in admission into the AP program or qualifying for AP classes based upon previous academic performance. All learners have tested into the school district's advanced program. PSAT scores for verbal aptitude range must be from 490-610. NWEA RIT Reading scores must indicate a score between 230-259 to be enrolled in the course. Age ranges for the learners in this class is from fourteen to fifteen years old. Based upon my observations, this creates varied and constantly shifting developmental levels due to the physical, social, and emotional changes present during these age ranges. Most learners in this class are from middle-to high income levels; for example, no learners will be enrolled in the reduced lunch program. In the combined APHG sections in 2021-2022 there were 30 girls and 21 boys enrolled in the classes; 36 learners are Caucasian, 8 learners are African American, and 7 learners are of Asian descent . The demographic characteristics of the sample are uncontrollable by the researcher but reflect the whole population of APHG test takers in aptitude, gender, race, and income levels at a national scale (The College Board, 2021). The learners in this class have been identified as advanced learners and are taught according to both state Human Geography and Gifted and Talented standards. At the start of the research, no learners had a recorded Individualized Education Plan.

As the sole teacher of APHG at the ninth-grade level at Springdale High School in Springdale, SC, and as one who has taught and helped learners in the course both pre and

post adopting a one-computer-to-every-student plan, I have a vested interest in knowing if the addition of Schoology has helped or hindered learner interaction, or if it has had no discernable difference. In planning and implementing lessons, we are mandated by the Springdale School District and the southeastern U.S. state's department of education to demonstrate technological integration. *The 4.0 Rubric* teacher evaluation instrument used in the southeastern U.S. state includes a criterion on observing teachers' use and incorporation of educational technology even though local level data showing the usefulness of this implementation is nonexistent.

No previous attempts to understand the learners' perceptions of Schoology's interaction potential has been made in my setting. Generally, as noted through informal conversations with other AP teachers at the school, little emphasis has been placed, if any, by teachers and administrators towards the perceptions of learners toward Schoology. This study attempts to elucidate the learners' perceptions of the interactions which can be provided by Schoology. The data may show that learners who have positive perceptions of Schoology and who are actively interacting with instructor, other learners, and content aspects of Schoology perform better in the culture unit, including the unit test. The study gives insight into the connection between learner-instructor, learner-learner, and learner-content interaction provided via Schoology and learner achievement in advanced curricula at Springdale High School. The study attempts to show the significance between interaction provided by Schoology and learner success rates. Through this exploration, researched information will be added to the literature surrounding educational technology. The data may show that learners who are actively engaged with an LMS infused with interactive pedagogy can consistently learn in APHG.

Educators can use this knowledge to improve their own teaching practices and thusly the learning experiences of AP learners.

### **Statement of the Problem**

Students at SHS in APHG perceive that increased reliance on Schoology will result in inadequate interactions (learner-instructor, learner-learner, learner-content) for meaningful learning to occur in the culture unit of instruction (Plonski, 2018). Learners using the LMS Schoology in APHG courses at SHS, are the focus of this research. According to the College Board (2021), digital interaction in all three areas in American high schools, is lacking. Modules designed to increase interaction based on Moore's (1989) theory could improve students' perceptions of these Schoology-based interactions. Improved learner perceptions in turn may lead to improved performance. Therefore, if learners perceived Schoology's aspects were overwhelmingly beneficial, then traditional methods of instruction, such as lecture and discussion, should be updated. If teachers adhere to a model of instruction that does not include incorporating one-to-one technology interactions like those via Schoology, they may be hindering the learners' growth and not be providing the best possible educational environment.

### **Action Research Purpose Statement**

The purpose of this action research was to determine if increased interactive Schoology-based modules could affect learner perceptions concerning the lack of meaningful learning interactions (learner-instructor, learner-learner, learner-content) in a culture unit of instruction in APHG.

### **Research Questions**

Four research questions guided this study:

1. What are learners' perceptions of the learner-instructor, learner-learner, and learner-content interactions presented via Schoology interactive modules in an APHG culture unit of instruction?
2. What barriers are reported by students that hinder meaningful learner-instructor, learner-learner, and learner-content learning while using the Schoology interactive modules in an APHG culture unit?
3. To what extent do students' perceptions of Schoology change after receiving increased interactive lessons presented through the Schoology interactive modules during an APHG culture unit?
4. To what extent does student learning, as measured by a culture unit assessment, increase, or decrease after the LMS driven instructional innovation?

### **Researcher Subjectivities and Positionality**

In reviewing my subjectivities and positionality, I begin with an overview of my research paradigm. Next, I discuss my positionality within that research. Last, I discuss the subjectivities which are present in my research.

My action research centered on a problem of practice that required a constructivist paradigm and the research was based on constructivist epistemology. My action research explored the context specific views and perspectives unique to the participants. My study is critically linked to how my learners perceive and interpret the interactions provided in their Schoology experiences (Yilmaz, 2013). A hermeneutic constructivist paradigm allowed me the opportunity to study the constructed experiences of the participants. My



mixed methods action research study used an in-depth analysis of the participants' perceptions and an evaluation of the interactions received through Schoology.

Through my research, I hoped to gain insight into the utilization techniques, and the general perceptions that this current generation of high school computer users have concerning interaction provided by Schoology. By understanding how learners view and interact while using technology I can strengthen my own knowledge base and become better at what I do. My research paradigm, constructivist, allowed me to make my own advances in my craft. If I could construct what computer-aided interaction actually means to the learners, then I would become a better informed and understanding educator.

My positionality was as an insider (Herr & Anderson, 2005). I am well established in the high school community. I am an insider in collaboration with other insiders; however, I am not a learner in the same way as the high school aged students in my classroom. My collaboration with these participants helped close the distance that existed between how I felt about Schoology versus the attitudes of my learners. Negotiating this positionality required work. I kept a researcher's journal in which I recorded my subjectivities and how I confronted them throughout my research. I understood that reflection was a key component of action research. I stayed grounded and aligned with my research purpose as I moved through the process of research and dissertation writing.

My positionality as an insider only granted me limited access into learners' attitudes and perceptions. It was impossible for them not to see me as a teacher first and a researcher second. I balanced my access into their perceptions with the very real fact that as a teacher I did have the power to affect their educational careers. My research

paradigm served to ground me in this struggle. My goal was to interpret how learners use technology and to report my findings, hopefully for the benefit of the participants in my context. My worldview and all of my experiences grounded me as well. I have an open, progressive attitude that embraces individuality and change. This helped me appreciate the perceptions, evaluations, or concerns shared with me toward one-to-one technology integration. I was wary however not to allow my dismissive viewpoints toward the more conservative outlooks shared by some teachers and learners affect the research. As I continued with my research, I remembered to come back to the purpose of my study, to understand and improve pedagogy based upon learner perceptions of Schoology's educational interactions. Self-reflection, especially upon what I discovered during my research, allowed me to manage my positionality and my subjectivities (Mertler, 2019).

Trying to understand educational phenomenon, and trying to gather what best helps learners to learn are at the core of why I decided to pursue an educational technology degree. Computers, one-to-one integrations, and the using of an LMS such as Schoology, are coming to schools nation-wide (de Koster, Volman, & Kuiper, 2017). I want to be in on the forefront. In essence, I want to be able to answer for my learners why we use the tools we do, and I want to be the one to show what wonderful educationally interactive opportunities the technology can provide. I would be remiss if I did not add that I want to achieve the highest level of distinction in my field possible and have the satisfaction of an advanced degree from a highly reputable university.

An ideal educational technology professional would be able to knowledgably communicate or demonstrate to learners exactly what the technology coupled with a talented learner can achieve. I would like to be able to help learners see beyond the

“coolness” or all the bells and whistles of a computer and really connect with the possibilities that a digital tool can provide. I started life with zero access to technology. During my formative years computers were mostly marketed as game consoles or word processors. I didn’t receive my first email until I was a junior in college. Additionally, as the product of a working-class family in a blue-collar city, we could not afford access to the latest technology. Only through my advancement through undergraduate, then graduate school, did I force myself to learn how to use technology. I started at the bottom, now I am in the position to earn a doctorate concentrating in educational technology. I worked my way, now I want to guide others in their exploratory technological journeys.

Naturally, these experiences have significant downsides. Being mostly self-taught may sound admirable but also implies that I initially had little formal computer training. My subsequent training has all been as a teacher, where we tend to focus on the outcome rather than the process when technology is concerned. The subsequent training all has been a result of my district’s one-to-one integration policy. Some aspects of my training have been extraordinarily useful, while others have been tedious, dull, and with little practical applications that I or my learners can use. This training and its singular focus, on educating high school learners with computers, is a limitation. Outside of educational usage, I have little skill in technology. I am not a software, hardware, or any other sort of technological guru. I am good at integrating applications into a high school Social Studies curriculum, but that is my peak.

As a learner, I had no access to educational technology, partially due to the poverty of my family and partially due to the general lack of educational technology that

existed in my formative years. As a twenty-plus-year teaching veteran, I have placed myself at the forefront of educational technology. I work in a fully integrated one-to-one school district. I have spearheaded efforts to adopt technology when my district was contemplating the switch ten years ago. I have piloted several initiatives and have been trained in multiple areas of technology integration.

I believe that, on balance, technological integration is a positive and will reap benefits for learners. I believe, and am thusly biased, to see schools as a great leveling agent in our society in general and to see the particular utility that computers can have in creating equality of access and opportunity for all learners. I acknowledge that some issues, like home devices, internet access, remain unequal, and that our society has an obligation to its learners to provide, and to educate all students on the proper utilization and potential of computers. All learners can learn, we can help them interact and learn more efficiently and perhaps equally with a LMS, like Schoology. With this worldview, my paradigm as a constructivist becomes clear. I want to understand the meaningful usage, the experimental experiences, and the interactions that learners have with technology. Again, my study is critically linked to how my learners perceive and interpret the utility of their interactive technology experiences (Yilmaz, 2013).

I am a teacher. I know the ins and outs of my context, my setting, and am well familiar with my participants. I have been a ninth-grade instructor at the same setting for sixteen years. I have become attuned to the educational needs of these learners throughout my experiences and now hope to learn more about how interactions through Schoology are affecting my participants. The participants are integral to the research. Their opinions will be recorded and analyzed in order to address the problem of a lack of

computer utilization. I faced access issues due to being a teacher among learners but feel that by openly sharing my goals I was able to display that I had no intention of abusing my access privileges or my power as a superior in my research. I negotiated my positionality by first acknowledging, recording, and to a degree, addressing my personal biases. I understood that when human learners are my participants that ethical issues will arise and that my job as researcher foremost is to minimize potential risk to my learners and most definitely to do them no harm (Agee, 2009).

With those considerations in mind, I begin by acknowledging that I do have a positive view of one-to-one integration and of Schoology. Despite that, I used research questions and a methodology that was not biased. As I structured my research I constantly was in a situation where I had to constrain my personal views in order to properly, and in a beneficent manner, conduct my study.

### **Ethical Considerations**

Potential ethical considerations that could have arisen in the research included obtaining permission from the participants, site selection, conveying the purpose of the research, potential site disruption, and researcher bias.

Due to the nature of a ninth-grade classroom, all of the participants are learners between the ages of 14-15 years old. These learners, who are considered to have limited autonomy, must agree to be the subject of the research in addition to receiving parental or guardian permission for the study. In order to avoid an ethical dilemma, a clear line of communication to both parents and learners concerning the purpose and potential impact of the study was made. According to the synopsis of the Belmont Report published by the Office for Human Research Protections (2019, p. 2):

The informed consent process involves three key features: (1) disclosing to potential research subjects information needed to make an informed decision; (2) facilitating the understanding of what has been disclosed; and (3) promoting the voluntariness of the decision about whether or not to participate in the research.

Logistically, composing, disseminating, collecting, and storing permission forms required vigilance to detail and a strict accountability by the researcher.

The site selected had a vested interest in the utilization of Apple MacBook Air laptop computers and Schoology. The school district has committed significant financial resources to providing a one-to-one environment and would assuredly welcome any data that proves the worth of the program. To assuage this ethical dilemma, the researcher maintained a strict level of impartiality to the outcome throughout the research process. No “undue influence” (The National Commission, 1979, Part C.1) could be exerted upon the learners. Maintaining an unbiased point of view, in addition to carefully constructing the research as to not incorporate a predestined outcome was critical to the study.

As previously stated, conveyance of the purpose of the study to all stakeholders was crucial to the researcher (me). The researcher had to act as an unbiased, impartial conductor of the study rather than be perceived as an advocate for a preconceived desired outcome. The goal of the researcher to ascertain the best pedagogical practices that would result in beneficial outcomes for the learners was made exceptionally clear. To accomplish this goal, frequent, transparent, and consistent communication with the stakeholders took place throughout the research.

Due to the nature of the site, a high school classroom, some disruption to the norm was expected. The researcher planned accordingly to minimize these disruptions. As the study was ongoing, learners were able to observe little to no differences in the normal, established routines. The integration of specific tasks or skill performances used to expose the participants to differing levels of interaction had to seem natural and not a forced, unusual activity for the learners.

Research bias was difficult to plan for; however, with proper maintenance of the study as it was ongoing, and with careful reflection upon the results, the researcher could maintain professionalism throughout the process. The danger inherent with a research study, where the researcher could also be seen as a stakeholder, in this case a teacher at the site, was very real. Only by separating myself from any desired outcome could the research take place in an ethical manner.

## Definition of Terms

**APHG learner Schoology usage** is operationalized as using an Apple MacBook Air laptop computer to access the digital interactive communication, peer-collaboration, and information dissemination aspects of Schoology.

**Challenges** are defined as scenarios that require full abilities or resources to overcome (“challenges,” n.d).

**Covid-19** is “a disease caused by a new strain of coronavirus. 'CO' stands for corona, 'VI' for virus, and 'D' for disease. Formerly, this disease was referred to as ‘2019 novel coronavirus’ or ‘2019-nCoV’” (World Health Organization, 2020).

**Interaction** is defined by Wegner (1994) as “reciprocal events that require at least two objects and two actions. Interactions occur when these objects and events mutually influence one another” (p. 8). Thurmond and Wombach (2004) define interaction as “the learner's engagement with the course content, other learners, the instructor, and the technological medium used in the course” (p. 4).

**Learner achievement** is operationalized for this study as a score of 3 or higher on the APHG exam (The College Board, 2021).

**Learner experience** is defined as the number of academic years the learner has had one-to-one technology in their school, specifically, experience using an Apple MacBook Air laptop computer and Schoology.

**Learner-instructor interaction** is defined by Moore (1989) as communications between the teacher and the student that occurs throughout the course. Moore also includes the scaffolding that an instructor does as a part of the interaction.



**Learner-learner interaction** is defined by Moore (1989) as cognitive and social communications among peers, where the instructor's presence is not required.

**Learner-content interaction** as defined by Moore (1989) refers to students' working with course material that alters a student's perceptions or understanding of the content.

**Learning Management System (LMS)** is an online platform that facilitates the administration and facilitation of courses (Ülker & Yilmaz, 2016).

**One-to-one technology integration** is defined by Penuel (2006) as:

- (1) learners have access to laptops that are loaded with contemporary productivity software (e.g., word processing, presentation, and spreadsheeting programs),
  - (2) learners have wireless access to the Internet, and
  - (3) learners use the laptops for academic tasks such as word processing assignments, taking eTests, and designing and delivering presentations.
- (p. 331)

**Peer-collaboration** is defined as a method where learners are engaged with teaching each other material (Teachnology, 2020).

**Schoology** describes itself as a social networking service and virtual learning environment for K-12 school and higher education institutions that allows users to create, manage, and share academic content (Schoology, 2021).

## CHAPTER 2: REVIEW OF RELATED LITERATURE

The purpose of this action research was to evaluate the effectiveness of learner-instructor, learner-learner, and learner-content interactions when presented through the LMS Schoology at Springdale High School in Springdale, a city in a southeastern U.S. state, during an APHG instructional unit. This evaluation of the interactions was based off the criteria for meaningful and purposeful learning provided by Piaget's (1966) social constructivist theory, specifically Moore and Kearsley's (2011) systems approach and Miyazoe and Anderson' (2010) interactive equivalency theorem (IET). These approaches seek to create meaningful interactions as described in Vygotsky's (1978) zone of proximal development (ZPD).

The review of the related literature focuses on four research questions. First, what are learners' perceptions of the learner-instructor, learner-learner, and learner-content interactions presented via the Schoology interactive modules in their culture unit of instruction? Second, what barriers are reported by students that hinder meaningful learner-instructor, learner-learner, and learner-content learning while using the Schoology interactive modules in the culture unit? Third, to what extent do students' perceptions of Schoology change after receiving increased interactive lessons presented through the Schoology in interactive modules during an APHG culture unit? And last, to what extent does student learning, as measured by a culture unit test, increase, or decrease after the LMS driven instructional innovation?

The research questions are addressed through the following methodology and supported with the theoretical data that justifies the innovation.

## **Method**

The methods used to obtain the literature for this review included keyword searches of academic databases, mining the references of useful literature, storing citations on an application, and creating a synthesis matrix. Keywords that I used frequently were *learning management systems* along with the indicating words: *communication, collaboration, and learner perceptions*. A widely focused keyword/phrase was *interaction* while on a narrow focus I searched for items specific to my research or participants such as *Schoology* or *AP students*. As the research progressed, I also searched for *instructing with* and *utilization of learning management systems*. This method narrowed down the potential sources and allowed for a refined reading of literature.

I started my research by using a university in the southeastern U.S. library's search engine. From this index, I was steered towards several academic databases: ERIC, Elsevier/Science Direct, and Google Scholar. Frequently, a pinpoint journal, such as *The Journal of Interactive Online Learning*, was directly searched in order to discover entries which directly reflected the purpose of my research. Other indexes that required subscription or purchase to access articles, such as Taylor & Francis, were viewed but not used to gather sources. By reviewing the literature reviews, methods, and limitations sections of articles to find correlating articles, I mined the references, searching for relevant topic articles that were recently published. I also stored references and journal articles in the Mendeley reference manager application and created a synthesis matrix to

sort the literature into thematic topic areas. This organization allowed for the further narrowing down of literature to that which is clearly related, peer reviewed, and current.

The review of the literature is organized into three sections. First, the social constructivist theory of learning, especially the ZPD, with a focus on online learning, is presented as the theoretical scaffolding behind the research, especially how online learners construct meanings through instructor, peer, and content interaction. The significance of interaction is discussed in order to set the criteria for instructing via LMSs such as Schoology in APHG. Second, barriers or challenges to interaction as provided through an LMS are addressed. Specifically, research focusing on the barriers to learners' use of LMSs for secondary instruction is examined. And third, whether students' perceptions of LMSs in general change after receiving increased interactive lessons is examined.

### **Social Constructivist Theory**

Constructivism, as originated by Piaget (1966), focuses on how learners construct knowledge through interactions with content. The interactions that a learner has with the content and the social interactions between the learner and other learners and teachers can make the construction of knowledge more meaningful (Schrader, 2016). The social constructivist theory expands these notions by focusing not just on the learner, but also on the engagements and interactions that a learner has with others, with resources, and with tools (Vygotsky, 1978). The learning process is not singularly dictated internally by the learner, but rather, knowledge is constructed through interactions with others (Schrader, 2016). Researchers apply the social constructivist theory of learning to explain how learners process new information and create or construct meaning from that data

(Moore, 1989; Northrup, 2001; Vygotsky, 1962; Woo & Reeves, 2007). Others have expanded upon this idea to incorporate not just the information but the tasks that learners use to construct meaning (Peterson & Scharber, 2017). Jonassen (1994) discusses the need for tasks to be authentic and complex but also social and reflective in nature.

Vygotsky (1978) preferred a conceptual understanding of the learning process through the ZPD that learning is dependent upon social interactions. The ZPD measures the amount a learner can learn independently, with the learning that can be accomplished with others, instructor guidance, or content-based tools (Schrader, 2016). Learners not only construct meaning through meaningful tasks but also through social proximity to instructors and other learners. Vygotsky (1978) emphasized that learners can expand their learning beyond their own individual constructs when they are assisted by peers and/or instructors during learning activities. Lessons could serve as scaffolds as described by Vygotsky in 1978, for students to receive the assistance they need before reaching academic autonomy. Lessons through an LMS, like Schoology, could step students through content, peer, and teacher interactions to achieve ZPD.

### **Three Types of Interaction**

To explore the significance of interaction in the social constructivist theory and in the ZPD in online settings three types of interaction are discussed: (1) the interaction between learner and instructor, (2) learner and other learners, and (3) between learner and content. Moore (1989) suggests that instructors "organize programs to ensure maximum effectiveness of each type of interaction, and ensure they provide the type of interaction most suitable for various teaching tasks of different subject areas, and for learners at different stages of development" (p. 4).

## **The Influence of Learner-Instructor Interaction**

Learner-instructor interaction is a critical component in learning (Laflen & Smith, 2017). Learner-instructor interaction is defined as the interactions between learners and teachers (Lin, Zheng, & Zhang, 2017; Sauers & McLeod, 2018). To learn or construct knowledge, this type of interaction is critical. Moore (1989) concluded that any interaction must include support, for example through formal assessments, and feedback but also through informal guidance offered in conversations, conferences, or other ad-hoc interactions. An increased frequency of learner-instructor interactions can be correlated to increased learning (Laflen & Smith, 2017). Also, an increase in learner-instructor interaction has the most significant effects on learning in any sort of distanced-learning environment (Hall & Miro, 2016; Moore, 1989; Sanders & Golas, 2013).

The significance of learner-instructor interaction is that it enhances a learner's ability to learn through increased feedback and engagement (Gilboy, Heinereichs, & Pazzaglia, 2014). Even in an asynchronous environment, learners receive increased feedback and personal engagement due to increased time for instructors to deliver these learning opportunities. Instructors can individually aid learners online far more extensively than in a traditional face-to-face setting (Hall & Miro, 2016; Snyder, Besozzi, Paska, & Oppenlander, 2016). The instructors' interactive roles with their students may be the most effective at creating online learning experiences (Gašević, Adesope, Joksimović, & Kovanović, 2015; Laflen & Smith, 2017). Additionally, students are more self-responsible, likely to complete tasks and increase content knowledge with effective learner-instructor interaction (Gilboy et al., 2014; Xu & Shi, 2018).

Many researchers acknowledge an increase in learning with an increase in learner-instructor interaction. Some find that this interaction is challenging for instructors to implement effectively due to time constraints (Gilboy et al., 2014). For example, instructors reported leaving minimal feedback, a critical learner-instructor interaction, when using traditional instruction versus instruction offered through an LMS (Lin et al., 2017; Uzir et al., 2020). An instructor must plan for and attend to the interactions with students or an atmosphere conducive to meaningful learning will not exist (Hall & Miro, 2016). Increased interaction will lead to increased learning opportunities if implemented and monitored correctly (Moore, 1989).

Overall, strong evidence suggests that interactions between learners and instructors can be a successful way to prepare students when the proper channels are provided for feedback, communication, and consistent interaction, which all can be provided by an instructor through an LMS like Schoology (Shin, Kim, & Song, 2019).

### **Methods Used to Study Learner-Instructor Interaction**

Learner-instructor interactions have been studied through a meta-analysis which compared distanced learning strategies with those of traditional classes (Bernard et al., 2009; Wilson, 2017). The criteria for a study's inclusion in the meta-analysis were a two-variable comparison: public school settings and where an instructor-created innovation was presented for research (Bernard et al., 2009). The meta-analysis concluded that achievement testing, as well as qualitative surveys and panel groups, provided sufficient data to evaluate the efficacy of learner-instructor interactions (Bernard et al., 2009; Li & Liu, 2021). Moore and Kearsley's (2011) amalgamated literature review cites surveys, discussions, and panel groups as crucial data sources. Rhode (2009) published the results

of interviews and surveys which strengthened the notion of the role of the instructor in fostering interaction and the value that students appoint to that interaction. Miyazoe (2009) also examined qualitative data to conclude the importance of learner-instructor interaction.

### **The Influence of Learner-Learner Interaction**

Individuals learn not just from instructors but also from others in a similar or the same educational setting. Learner-learner interaction is that which occurs between a learner and another learner or group of learners (Lin et al., 2017). In terms of learning, some researchers express the notion that learner-learner interaction is more significant than learner-instructor interaction (Gašević et al., 2015; Robinson, Sheffield, Phillips, & Moore, 2017; Sanders & Golas, 2013). Anderson (2003) asserted that the most meaningful and deepest learning could best be achieved through this type of interaction, and therefore, it must be facilitated by instructors through LMS usage. The critical elements that an instructor needs to incorporate into a lesson that facilitates learner-learner interaction should include giving students opportunities to work with classmates academically, such as in group projects or topical discussions and by modeling appropriate interaction, especially among learners. Instructors need to provide feedback and debriefing opportunities, specific to these interactions, in order to enhance students' learning opportunities (Blackley & Walker, 2017; Eison, 2010; Hew, 2016).

Learner-learner interactions require a deal of scaffolding in terms of challenge and interest from an instructor, but the influence that peers can have on learning is significant when leadership, trust, and open communication are present (Du et al., 2018). For example, assigning students to various roles in a problem-based group project such as



team leader, PowerPoint designer, researcher, or presenter, based-off of the students' observed talents or deficiencies can increase confidence or help students build necessary skills. Leadership, trust, and open communication, therefore, are variables that need to present in the learner-learner interaction for a successful and meaningful learning experience.

Although the influence of learner-learner interaction is considered significant by most researchers, some have expressed concerns that facilitation of peer groups is too difficult to be effective (Du et al., 2018). For example, knowing and understanding the changing social or emotional pressures that group assignments may present to students is difficult to manage. Putting students in purposeful groups that best develop interactivity requires knowing the strengths and weaknesses of all of the students. Others stress the lack of quantitative or qualitative research as a gap in the literature that needs further exploration before the influence of learner-learner interaction can be evaluated (Oyarzun, Stefaniak, Bol, & Morrison, 2018). For example, the negative effects on learning created by a poorly constructed group, or when group interactions are limited because of a student being misplaced, have not been researched due to the potential harm to students. Overall, deep research into learner-learner interaction is under-researched, especially in a digital environment (Lin et al., 2017).

There has been an increased quantity and quality of digital peer interactions in education (Siri & Antasari, 2019). For example, students who collaborate digitally tend to score higher on individual assessments (Sanders & Golas, 2013). These interactions may increase learner to learner proximity as described by Vygotsky (1978) in the ZPD, which could result in more opportunities for meaningful learning to occur.

## **Methods Used to Study Learner-Learner Interaction**

Learner-learner interaction has been methodologically studied through student pre- and posttests, as well as through surveys, panel groups, and interviews (Bernard et al., 2009) Additionally, Moore (1989) argued that age, experience, and modality of interaction should all be considered critical variables. Moore additionally concluded that peer-collaboration, such as reports or presentations, ending with peer-debriefing and appropriate feedback would increase learner knowledge.

## **The Influence of Learner-Content Interaction**

Learner-content interaction at one point was the only interaction possible in distance learning (Selwyn, 2011). Although the digitalization and communication aspects of distance learning have advanced, learner-content interaction remains a crucial element in learning (Anderson, 2003; Moore, 1989). Learner-content interaction is described as learner activity with materials or tasks (Lin et al., 2017). Early research into this interaction had disparaging notions on the process of the interaction. Moore (1989) initially described the interaction similarly to a one-way street, with materials being disseminated by an instructor to learners. For example, most distance education programs utilize an LMS primarily for dissemination of course materials without utilizing other interactive aspects (Selwyn, 2011). With the advent of additional audio-visual technologies, most researchers now see the interaction as more involved. For example, learner-content interactions include interactive lectures, participatory projects, and other digitally enhanced pedagogical tools, such as LMSs (Anderson, 2003; Moore & Kearsley, 2011).

Several studies have documented the correlations between online course participation and student success. Positive outcomes were associated with more time engaged in the online content. For example, students who actively engaged with content presented online had a significantly higher success rate on assessments than learners who admitted limited or no interactivity with digital content (Morris, Finnegan, & Wu, 2006; Shea & Bidjerano, 2014). This is significant because learners who have higher levels of interactivity with content have higher levels of academic success, therefore, learners who consistently interact with content through an LMS, such as Schoology, should enjoy increased levels of meaningful learning.

Despite these findings, learner-content interaction is the least researched area of influential interaction (Xiao, 2017). However, as technological tools increase in educational settings, learner interaction with content is increasing. Therefore, LMSs are being employed more frequently to create learner-content interactions (Snyder et al., 2016). Although technology may increase learner-content interaction, it may also come at a sacrifice, that is the decrease in learner-instructor interaction (Gašević et al., 2015). Moore (1989) believed that this pitfall could be avoided with well-facilitated and structured lessons that require integration in all three interaction areas.

Other qualitative research, employing survey and questionnaire analysis, has been used to conclude that learner-content interaction is the most quickly changing interaction as technology innovations increase learner autonomy (Miyazoe & Anderson, 2010). Additionally a meta-analysis (Bernard et al., 2009) examined several mixed-methods studies and concluded the importance of learner-content interactions. Overall, the

influence that learner-content interaction has on learning is dependent upon instructor and individual learner experience and aptitude, which is a severe weakness (Xiao, 2017).

### **Methods Used to Study Learner-Content Interaction**

Increased learner-content interaction has been shown to increase learners' opportunities for meaningful learning. Several qualitative tools are frequently used to gather data on the significance of learner-learner interaction. Einfeld (2014) used coded observational data, field notes, questionnaires, and interviews to measure students' interactivity with content and found that increased interaction between learners and content led to higher assessment scores. In responses to an online survey students reported that the higher the levels of learner-content interaction the higher achievement levels can be predicted (Kuo, Walker, Schroder, & Belland, 2014). Surveys of learners given post-instruction found that learners who interacted longer with content achieved at higher levels (Špilka, 2015). Learner-content interaction as provided through technology, such as the LMS Schoology, was reported in halfway and post-course surveys as being superior to content interaction via textbook or other print material (Veletsianos, 2010).

### **Approaches to Facilitate Online Interaction**

As online learning increases in secondary schools (Stone, O'Shea, May, Delahunty & Partington, 2016), several approaches have been developed to maximize the interaction between learner and an instructor, other learners, and content. Two of these approaches are further discussed: (a) the systems approach of Moore and Kearsley (2011) and (b) the interaction equivalence theorem (Miyazoe & Anderson, 2010).

**The Systems Approach.** The systems approach was initially developed in the 1970s by Wedemeyer (1981) as a reaction to an increase in distance learning (Saba,

2012). As technology increased in the 1980s, Moore (1983) advanced the systems approach when describing how distance learning manifests in contemporary education. First, distance is not a physical unit, but rather a measure of the psychological and social space between learners and instructors, other learners, and content (Moore, 1983). The distance between the learner and these interactions, known as transactional distance, is measured through the level of independence learners have in their setting, and by what system is utilized in order to bridge that distance (Moore, 1983).

Wells in a 1999 study advanced the notion that scaffolded instruction, as opposed to direct instruction, was the clearest way to reach Vygotsky's (1978) ZPD while teaching. Therefore, the way in which a teacher embeds or scaffolds an activity in a lesson is crucial to achieving the required interaction to achieve a ZPD. Scaffolded lessons that an instructor has created and posted to an LMS creates a potential ZPD by transferring the responsibility of completing and creating meaningful learning from the modules to the learners themselves (Mercer & Fisher, 1998).

The systems approach can be used to guide planning and measure the effectiveness of an instructor to provide meaningful learning opportunities because Wedemeyer and Nejam (1969) described an effective system as one where instructors create opportunities for learners to be engaged in the design, development, production, implementation, and evaluation of the process. This collaboration or interactivity between instructor, learners, and the content must be present in order for learning opportunities to manifest (Wedemeyer & Nejam, 1969). Therefore, the systems approach and its criteria are used to measure the interactions between the instructor-learner, learner-learner, and learner-content as provided by the instructor, through an LMS, such as Schoology, in

order to determine the effectiveness of those interactions. Effectiveness is measure as the ability of the interactions to affect the learners' ZPD.

**The Interactive Equivalence Theorem.** A second approach is the interactive equivalence theorem or IET developed by Anderson (2003) as a way to gauge interaction in distance education settings. The IET asserts that meaningful learning can occur in one type of interaction when interaction, either learner-content, learner-learner, or learner-instructor, is deep and purposeful. Learning can occur in one type of interaction even as the other types of interaction are diminished (Miyazoe & Anderson, 2010).

According to Croxton (2014) and Xiao (2017), the IET is supported best through a well-developed and structured series of interactions between the learner and the instructor. Learners have consistently reported that the most critical interaction needed for success in online settings is with their instructor (Croxton, 2014; Laflen & Smith, 2017; Sayfour, 2016). Therefore, the IET is used as a measure of the instructor's ability to create interactive modules that provide meaningful opportunity and provide a ZPD.

### **Barriers to Online Interaction**

Despite the possibilities offered through online interaction, learners frequently report that barriers or challenges exist while interacting with instructors, other learners, or content (LoCasale-Crouch et al., 2016). Understanding the challenges or barriers that learners have while interacting online can be useful in evaluating the effectiveness of online or digital tools, such as, an LMS like Schoology. In this exploration an explanation of the barriers that learners generally face while using an LMS is offered. The following is a specific investigation into the challenges/barriers that were reported by learners in

similar settings. By exploring these variables, the innovations can be designed to avoid these pitfalls in creating interaction.

**Barriers with Learner-Instructor Interaction.** The ability of an instructor to use an LMS as an effective interactive instruction tool is a significant barrier to interaction (Araka, Maina, Gitonga, & Oboko, 2020; Saini & Goel, 2020; Wilson, 2017). Unfortunately, some instructors lack proper training in managing and facilitating an online course (Alenezi, 2018). Specifically, research that is focused on the barriers that instructors have while utilizing an LMS to foster interaction indicate that instructors cite common issues, such as a lack of experience, training, or ability (Alenezi, 2018).

Additional research by Shackelford and Maxwell (2012) reveals that meaningful and successful learner-instructor interaction can be created and planned for by the instructor if he or she achieves the following seven criteria:

- providing information on goals, expectations, and ethics
- participation and guidance during discussions
- providing support and encouragement
- providing timely feedback
- utilizing multiple modes of media and communication
- modeling academic behaviors
- requiring learner participation

These criteria shape interaction in online settings in particular because they can all be accomplished via an LMS. For example, an LMS typically has extensive communication and feedback tools that allow frequent and personal discussion of topics, assignments, and feedback commentary (Green & Chewning, 2020; Mtshazi & Coleman, 2017;

Schoology, 2021). By constructing lessons that meet these criteria an instructor can create opportunity for multiple meaningful interactions with learners throughout the course of a unit. These meaningful learner-instructor interactions can be created through an LMS interface, such as Schoology, with the assistance of online help, guides, and templates, therefore lessening the barrier to the learner-instructor interactions (Schoology, 2021).

Interaction as evaluated by learners with their instructors represents a gap in the literature (Araka et al., 2020; Saini & Goal, 2020; Wilson, 2017). Despite the lack of data, school districts rapidly are adopting LMSs (Duin & Tham, 2020; Kumar, Vitak, Chetty, & Clegg, 2019; Martin & Ndoeye, 2016). This combination of inexperience and rapid adoption may manifest as a barrier to meaningful learner-instructor interaction, especially if the instructor lacks the ability to interact through an LMS. An inability to create learner-instructor interaction, especially a personalized relationship, is a barrier to meaningful learning interactions (Singh, Rajput, & Baber, 2019).

To address this barrier, teachers require more training with interactions (Baig, Gazzaz, & Farouq, 2020). Schoology offers several tutorial modules in order to assist teachers in using the LMS to achieve meaningful interaction (Schoology, 2021).

Schoology recommends cohort groups of instructors working with the LMS form in order to collaborate, share insights, and practice using the interactive communication and dissemination elements of Schoology (Schoology, 2021). To overcome the barriers to learner-instructor interaction, a well-structured approach to designing content interactions can increase learner motivation if appropriate content challenges are planned (Slavin, 2011). The APHG culture unit includes activities and lessons posted to the LMS that are well-structured, include motivational strategies (such as graded action), and are



challenging based-off of the standards created for APHG by the College Board (The College Board, 2021; Nilson & Goodson, 2017).

**Barriers with Learner-Learner Interaction.** Learners have indicated in studies that engagement between peers can be developed by using an LMS only if mutual engagement is fostered and encouraged (Alshorman & Bawaneh, 2018). Many learners reported that learner-to-learner interactions as provided via an LMS are not beneficial to their learning because they fail to generate excitement and interest and often the interactions are arbitrarily created by instructors (Baig et al., 2020; Nganji, 2018; Truitt & Ku, 2018). A lack of useful learner-provided feedback is an additional barrier (Montrieux, Vanderlinde, Schellens, & De Marez, 2015; Ryan, Henderson, & Phillips, 2019). Some students who use LMSs for peer interaction found them to be limited or offering no benefit (Abdurrahaman, Owusu, & Bakare, 2020; Bond, Marín, Dolch, Bedenlier, & Zawacki-Richter, 2018; Lai, 2016; Ross, Crittenden, & Peterson, 2019). This is an instructional planning issue. If the lessons are well-structured, challenging, and provide for external motivations such as grades then these barriers are overcome (Nilson & Goodson, 2017).

To overcome these barriers, the learner-learner interactions need to be viewed by a participant as meaningful (Madland & Richards, 2016). For example, learners can develop an interest in the material if teachers create purposeful, non-arbitrary interactions that allow for learner-learner discussion, analysis, and peer review in a collaborative manner (Madland & Richards, 2016). Last, an academic relationship with other learners that is mutually beneficial and incorporates feedback helps to overcome any social-emotional barriers to interaction (Madland & Richards, 2016). Criteria set by the

University of Missouri at Kansas City (2021) states that instructors can foster learner-learner interaction by following these instructional mandates:

(1) to give students opportunities to connect with their peers, socially (e.g., a "watercooler" discussion forum, personal introductions) and academically (e.g., group projects, topical discussions); (2) to provide modeling and guidance to students on how to positively interact with one another (e.g., filling out group contracts for projects, building in a training module on the soft skills of team collaborations, or providing a peer review rubric or worksheet for students to fairly evaluate one another's work); (3) encouraging learner-learner interaction (e.g., sending announcement reminders to participate in discussions, highlighting excellent examples of collaboration and academic discourse evidenced by some of the learners); (4) providing feedback aimed at improving the quality of learner-learner interactions (e.g., feedback to groups about the quality of work but also the workflow and process, or encouraging learners privately to make more substantive and probing responses to peers in discussions so as to elicit conversation).

By utilizing these criteria to give students opportunities to connect with their peers, socially, for example a discussion forum or personal introductions, and academically, for example with group projects or other collaboration activities, instructors can alleviate learner-learner interactivity concerns by incorporating problem-based activities, case studies, peer-reviewed research projects, video critiques, and other pedagogical strategies that increase purposeful learner-learner interaction.

**Barriers with Learner-Content Interaction.** Barriers which prevent interaction with content in a course, usually involve an inability to operate the LMS or a lack of authentic opportunities to engage with course content (Purarjomandlangrudi, Chen, & Nguyen, 2016; Sayfour, 2016). Although numerous strategies, such as flipped lessons, backward-by-design, or project-based learning, are accessible to instructors or LMS managers to create content-engaging activities, few have the training to provide the structured lessons needed to foster learner-content interaction (Alenezi, 2018). As noted by Xiao (2017), a gap in the related literature exists. Specifically, the need for more research in evaluating learner-content interactions through an LMS is evident. To overcome these barriers Xiao (2017) recommends increased interactions with various types of content - digital and or traditional. For example, in APHG, students are provided by me with multiple media types, including many that are supported by the LMS platform, such as: videos, TED talks, online databases, and other content-rich interactions. According to Nilson and Goodson (2017) these accommodations can overcome barriers and make learner-content interaction meaningful.

### **Learner-Content Partners for APHG Instruction**

A number of platforms provide content and interactions as an accompaniment to an AP course, including APHG. Thus, a review of the top three online APHG instructional platforms are examined in terms of their ability to be transactional distance mitigation platforms and to what extent they provide meaningful interaction (digitaldefynd, 2020). The platforms offered by Princeton Review, Khan Academy, and Kaplan are evaluated in sequence. The programs that will be illustrated show how different LMSs try to offset barriers to transactional distance and are those that are

targeted for APHG instruction and exam preparation. The evaluation of the online tools is focused on their abilities to provide interaction in all three areas.

**Princeton Review.** This online site offers learners the option to enroll in online exam preparation programs (Princeton Review, 2020). Although the site touts a “96%” improvement in the grades of learners enrolled in the program, it does not discuss the levels of interaction within their modules (Princeton Review, 2020). In terms of interaction, this module offers a six-hour crash course, which is highly focused on learner-content interaction. Recall that Xiao (2017) indicated this was the least researched interaction. In terms of learner-learner interaction, there is no model where learners interact. In terms of learner-instructor interaction, the site does have course instructors who interact with learners, but to what extent or how often is vague so much so that the website refers learners to their onsite high school teachers as a resource (Princeton Review, 2020). Based on the systems approach and the IET, The Princeton Review fails to offer adequate interactive opportunities for learners.

**Khan Academy.** This is the officially recognized partner of the College Board in terms of asynchronous instruction and online exam preparation tools, offering videos, articles, and practice exercises at a self-paced level (The College Board, 2018; digitaldefynd, 2020). Again, an online instructor is assigned to learners, but the level of interaction is insufficient to meet the systems approach criteria. Therefore, it does not provide interaction as defined in the ZPD theory. Additionally, the Khan Academy does not currently include a course in neither APHG instruction nor exam preparation (Khan Academy, 2020).

**Kaplan.** This site is highly similar to the previous two; however, it does offer a one-to-one tutoring program for learners (digitaldefynd, 2020). This interaction, if meaningful, could potentially satisfy the criteria of the IET (Miyazoe & Anderson, 2010). The tutoring program is only face-to-face and not available at this time for the APHG exam (Kaplan, 2020).

### **Learner-Content Partners for APHG Instruction Summary**

Although other platforms exist, it follows logically that the top three rated online programs are not offering APHG instruction, do not meet the interactive criteria of the IET, and are not systems which should replace an instructor proctored LMS. Simply, an instructor-facilitated course through an LMS, such as Schoology, offers far more opportunities for learner interaction in all three areas.

Learners in AP courses consistently report that higher levels of interaction, of any kind, increases engagement (Heflin, Shewmaker, & Nguyen, 2017; Hendrix & Degner, 2016). Learners especially felt that impromptu discussions with other learners were more beneficial and meaningful than posting boards or other forms of delayed peer or instructor feedback (Balta, Perera-Rodríguez, & Hervás-Gómez, 2017). Generally, LMS usage is more interactive as compared to online preparation sites, which leads to learner achievement (Han & Shin, 2016). Overall, in comparing the top three online platforms, The Princeton Review, Khan Academy, and Kaplan, they lack the interactive ability of an LMS, such as Schoology, to connect learners with meaningful experiences.

### **Chapter Summary**

Constructivist theory promotes that learners build knowledge by attaching meaning and purpose to what is being learned (Creswell, 2013; Crotty, 1998). Online

learners are not an exception (Moore, 1989; Northrup, 2001; Peterson & Scharber, 2017; Woo & Reeves, 2007). To facilitate learning, interaction is crucial for learners (Haron, Aziz, & Harun, 2017). Interaction is subdivided into the interactions between learner and instructor, learner and learners, and learner and content. Miyazoe and Anderson (2010, p. 94) concluded that “deep and meaningful” formal learning is supported as long as one of the three forms of interaction (student–teacher; student–student; student–content) is at a high level. The other two may be offered at minimal levels, or even eliminated, without degrading the educational experience. Additionally, Moore and Kearsley (2011), determined that enhanced and effective lessons that incorporate all three types of interaction will be more effective. LMSs, like Schoology, are designed to help instructors create all three interactions (Green & Chewing, 2020). Interactivity allows for meaningful learning to occur (Moore, 1989). The criteria for interaction are set by the systems approach and the IET. By using these approaches and evaluating contemporary online interactive programs, it is evident that they are not nearly as interactive as an LMS. Despite the advantages of LMS usage, barriers exist to successful and meaningful interactions. By carefully scaffolding all three types of interaction into the culture unit, these barriers can be overcome and in fact an atmosphere conducive to learning can be created (Nilson & Goodson, 2017).

## CHAPTER 3: RESEARCH METHOD

### **Research Design**

This research was a mixed methods design in an action research setting. A quantitative survey was examined convergently with qualitative interviews and a panel group. A widely utilized purpose for using mixed methods research, as stated by Greene, Caracelli, and Graham (1989, p. 257) is that it “seeks convergence, corroboration, correspondence of results from different methods.” This method is recommended for educational settings due to the problem-based nature of educational research (Plano Clark & Ivankova, 2016).

Action research is defined by Mills “any systematic inquiry conducted by teachers, administrators, counselors, or others with a vested interest in the teaching and learning process or environment for the purpose of gathering information about how their particular schools operate, how they teach, and how their students learn” (2011, p. 7).

Action research was appropriate in that it is a design conducive for fulfilling the purpose of this study: to examine and evaluate learners’ perceptions of Schoology and determine if the learner-instructor, learner-learner, and learner-content interactions facilitated through Schoology meet the criteria for meaningful interaction as set out in Moore’s (1989) theory of transactional distance, the systems approach (Moore & Kearsley, 2011) and the interaction equivalence theorem (Miyazoe & Anderson, 2010) and can create a ZPD as described by Vygotsky (1978).

This action research study focused on four research questions. First, what are learners' perceptions of the learner-instructor, learner-learner, and learner-content interactions presented via the Schoology interactive modules in their culture unit of instruction? Second, what barriers are reported by students that hinder meaningful learner-instructor, learner-learner, and learner-content learning while using the Schoology interactive modules in the culture unit? Third, to what extent do students' perceptions of Schoology change after receiving increased interactive lessons presented through the Schoology interactive modules during an APHG culture unit? And last, to what extent does student learning, as measured by a culture unit assessment, increase, or decrease after the LMS driven instructional innovation?

Action research was used to address the research questions concerning learners' interactions with instructor, other learners, and content, as it fits the purpose of action research, namely, to act as an inquiry into teaching, learning, and how schools operate, and learners learn (Mills, 2011). Action research offered the pragmatic opportunity to best link the purposes of my research, exploring an educational problem, with the most appropriate research design, a mixed methods approach (Morgan, 2019). By examining and evaluating learner perceptions through a mixed methods action research it offered a reflective window into the use of learning tools like the LMS Schoology (Johnson, 2008).

Action research was appropriate as it provides an opportunity for a classroom teacher to analyze their practice in their specific context. The data gleaned from this research, can be used to aid in reflection, and improvement of pedagogical skills (Parsons & Brown, 2002).



Action research also offered reciprocal benefits to learners. As I reflected and improved upon my teaching due to the action research process, I was able to offer improved instruction, and interactions to my students. Action research is a process designed to be beneficial in a particular setting, therefore, it is a process where the researcher is a member of and has a vested interest in addressing or solving a problem of practice in order to improve the setting (Rudestam & Newton, 2007). Additionally, this action research allowed for an evaluation of the LMS programs rapidly being adopted by schools. Keeping current with the ever-evolving educational system is possible through well-structured action research.

On balance, action research has benefits for all educational stakeholders, but specifically the characteristics of action research were beneficial to a teacher trying to improve his or her practice (Mertler, 2017). The setting of my research was a high school classroom. By using action research, I instituted a cycle of identifying a classroom problem, developing an action plan in order to address the problem, collecting data, using that data to address the problem, sharing results with all stakeholders, and reflection upon the process in total (Hewitt & Little, 2005). Action research provides educators, students, parents, and administrators an insight into the problems of practice, researched analysis, and culminating data which can be used specifically in my setting to improve learning opportunities (Hine, 2013).

Action research allowed me to design a research innovation, namely the Schoology-based instructional models, and then test their effectiveness by evaluating my students with a validated pre and posttest. I also gathered qualitative data, a survey, and a panel group discussion, to aid in determining the effectiveness of the lessons in terms of

creating meaningful learning opportunities for the students, and, to what extent was that opportunity perceived.

### **Setting and Participants**

This action research took place at an urban high school located in a southeastern U.S. state. Specifically, the participants were learners enrolled in APHG at the ninth-grade level. This was a purposeful sample as all learners/participants were enrolled in the course in which I serve as instructor and as researcher. The students were all enrolled in the course and used the LMS which was being evaluated. Learner participation was voluntary, meaning opting out of participating in the data collection aspect of the study was an option, and both learner and parent informed consent was mandatory for participation. As a part of the school's core curriculum, all students enrolled in APHG received instruction via the innovation, however participation in the survey and panel group was not mandatory. Placement in this course was based upon test-in admission into the AP program or qualifying for AP classes based upon previous academic performance. Learners in this class were largely self-motivated. All learners had tested into the school district's advanced program. PSAT scores for verbal aptitude must range from 490-610 and NWEA RIT Reading scores must indicate a score between 230-259 to be enrolled in the course. Age ranges for the twenty learners in this class were from fourteen to fifteen years old. Based upon my observations, this creates varied and constantly shifting developmental levels due to the physical, social, and emotional changes present during these age ranges. Most learners in this class were from middle-to high income levels; for example, no learners will be enrolled in the reduced lunch program. There were 10 girls and 10 boys enrolled in the class. Six learners are Caucasian, two learners are African

American, and two learners are of Asian descent. The demographic characteristics of the sample were uncontrollable by the researcher but reflect the whole population of APHG test takers in aptitude, gender, race, and income levels at a national scale (The College Board, 2021). The learners in this class were identified as advanced learners and are taught according to both state Human Geography and Gifted and Talented standards. No learners had a recorded Individualized Education Plan.

The digital setting of this research was a ninth grade APHG course facilitated through Schoology. My school has a one-to-one technology policy with each learner being issued a MacBook Air personal laptop computer.

Volunteers for a panel group were taken from the total population of learners in APHG. Generally, these learners begin using MacBook Air computers in the sixth grade and have developed skills in word processing, internet research, and other school-based activities, but as reported in a survey, learners to be enrolled in APHG generally felt unprepared for the rigors of an AP course and had ambivalent feelings toward the utility of Schoology (Plonski, 2018).

### **Innovation**

This research offered an exploration of the experiences of high school learners who had enrolled in APHG and who attended a one-to-one school. The study sought to give insight into the interactions provided through learning management system (LMS) usage. Specifically, how Schoology usage effected learners' perceptions of their interactions, learner-instructor, learner-learner, and learner-content, during the culture unit. As the sole instructor in this particular context, I understood that no previous attempts to understand the learners' perceptions had been made.

The study sought to understand and measure learners' qualitative and quantitative reactions to the learner-instructor, learner-learner, and learner-content interactions offered via Schoology during the APHG culture unit. This research explored and sought to understand the reasons why Schoology utilization in a one-to-one setting, specifically by learners in APHG courses, is lacking and if learners' interaction plays a role in those perceptions (The College Board, 2021). The innovation allowed for an evaluation of learners' perceptions of the interactions provided via the LMS Schoology using a panel discussion, interviews, and surveys with open-ended questions at both the beginning and at the conclusion of the unit. The innovation will consist of sixteen modules total, with fourteen of asynchronous instruction, illustrated in Table 3.1.

### **Significance of Interaction in Online Settings**

To review the significance of interaction in online settings, the research is subdivided into that which explores learner-instructor, learner-learner, and learner-content interactions. Vygotsky (1978) asserts that all three interactions are needed for social learning. In fact, inadequate interaction in these three areas is a major detriment to the successful application of online learning opportunities (Zawacki-Richter & Naidu, 2016). Additionally, Moore and Kearsley's (2011) systems approach and Miyazoe and Anderson's (2010) interaction equivalence theorem were researched for the purpose of determining how well and what measures needed to be provided in order for learners to interact in these contexts. Peer-reviewed and researched measures such as the pre and post survey were used to determine how well students qualitatively felt that the modules' interactions were effective in creating meaningful learning opportunities (Beck, 2020). To simplify, the efficacy of the three types of interactions in online settings was

researched to create a criterion for evaluating the effectiveness of my instruction while using the LMS Schoology as reported by the learners in my specific setting, AP students studying the culture unit.

Schoology is an application designed to increase learner interaction with content through tools such as the ability to access a digital textbook without internet access, the ability to view, annotate, and edit documents, PowerPoints, and other media, and the ability to access additional educational resources through a course library (Schoology, 2021). On balance, Schoology incorporates several tools which can foster learner-learner interaction, such as a direct messaging system, a course discussion board, and links to upload interactively created projects like Prezi or a Microsoft PowerPoints Online (Schoology, 2021).

**Theoretical Basis of the Interactive Innovation.** According to Moore and Kearsley (2011), Schoology matches the criteria of a tool that can bridge the transactional distance. Determining how effectively Schoology meet the criteria for a system which minimizes transactional distance, was accomplished by how well Schoology prepared learners, through its interactive tools, as reported by the learners. As a platform generally designed for asynchronous interaction, Schoology needed to provide independent learning opportunities, but through access to instructor-created scaffolded interactions.

**Creating the Interactive Innovation.** Scaffolded interactions were developed by the instructor who had been trained on the utilization of Schoology. Schoology possesses the technology to house file uploads of webcasts, lecture casts, Microsoft PowerPoint presentations, videos, audio files, and a variety of document formats including Microsoft Word and Apple Pages (Schoology, 2021). These files were then easily be disseminated

at designed intervals for the students by the instructor (see Appendix M-AB). Generally, the modules provided facilitation, coaching, and the opportunity for feedback which, when implemented effectively, meets the criteria for bridging transactional distance (Frantz & King, 2000).

By both adopting previously used techniques in the modules, such as collaborative projects, purposeful feedback, or discussion prompts, and by having the modules reviewed by other Social Studies teachers who are familiar with Schoology, the validity of the modules, in terms of scaffolding instruction, was strengthened. This process was informal, but the modules were all reviewed, critiqued, and in some cases revised after an examination from colleagues who are familiar with Schoology, the ZPD, and the intent of this research. In essence, if the Schoology-housed modules provided interaction for learners strongly in one of the three areas of interaction, it should have provided learners with the opportunity to master the APHG culture unit. Schoology provided a potential for all three levels of interaction (Schoology, 2021). According to Xiao (2017), this was critical because the IET lacks empirical evidence supporting that interaction in only one area is sufficient for meaningful learning. With proper facilitation, an LMS can be way for instructors to provide interaction at an equivalent level as face-to-face interaction.

My research sought to gather student-supplied data concerning the interactions provided via Schoology, specifically, how well the interactions with instructor, other learners, and content were perceived during the culture unit of instruction. Learners reported via surveys, a panel group discussion, and interviews. From this data, an evaluation as to whether students perceived a higher level of interactivity from instruction

provided via Schoology, which was designed to meet the criteria of the systems approach and the IET, could be made, adding to the existing data on LMS efficacy.

### **Rationale for the Innovation**

The innovation was a replacement of the traditional in-class mode of APHG instruction with a completely digitalized mode. All unit modules were placed on the LMS Schoology, and all learner interactions took place via Schoology. It was appropriate to offer instruction via Schoology due to more schools adopting LMS and one-to-one technology. The prognostication is that instruction may become primarily LMS supported in the near future (Findik-Coşkunçay, Alkiş, & Özkan-Yildirim, 2018).

**Table 3.1** *Module-Skill Category-Interactivity Table*

<b>Module</b>	<b>Skill category</b>	<b>Interactivity</b>
One	Defining folk and popular	Learner-learner Learner-content
Two	Origins and diffusion	Learner-instructor Learner-learner Learner-content
Three	Geographical differences between folk and popular culture	Learner-instructor Learner-learner Learner-content

<b>Module</b>	<b>Skill category</b>	<b>Interactivity</b>
Four	Origin and diffusion of folk and popular music	Learner-instructor Learner-learner Learner-content
Five	Origin and diffusion of folk and popular sports	Learner-learner Learner-content
Six	Elements of material culture	Learner-learner Learner-content
Seven	Folk and popular clothing	Learner-instructor Learner-content
Eight	Folk food customs	Learner-instructor Learner-content
Nine	Global system of culture Consequences of contemporary culture	Learner-instructor Learner-learner Learner-content
Ten	Popular food preferences	Learner-instructor



<b>Module</b>	<b>Skill category</b>	<b>Interactivity</b>
		Learner-learner
		Learner-content
Eleven	Folk and popular housing	Learner-learner
		Learner-content
Twelve	Contemporary culture: diffusion of TV/internet	Learner-instructor
		Learner-learner
		Learner-content
Thirteen	Contemporary culture: diffusion of social media	Learner-instructor
		Learner-content
Fourteen	Challenges with access	Learner-instructor
		Learner-learner
		Learner-content
Fifteen	Sustainability	Learner-instructor
		Learner-learner
		Learner-content

<b>Module</b>	<b>Skill category</b>	<b>Interactivity</b>
Sixteen	All	n/a

### **Participant Resources**

In order to facilitate a digital innovation such as this, the learners were provided with key elements, namely a 2019 or later model MacBook Air operating on the macOS Big Sur, and a Schoology account. All learners involved in the study were provided both by the school. This technology served as the platform for the innovation modules. Additionally, students were issued the currently adopted textbook, Rubenstein’s *The Cultural Landscape: An Introduction to Human Geography 14<sup>th</sup> edition*, which was available as a traditional text and as an online electronic text.

### **Content Requirements**

In order to master the required content, students proved, through assessment (see Appendix B), that they had gained competency in the following skill categories: folk culture patterns and diffusion methods, folk and popular culture origins, cultural revolutions, hearth regions, spatial organization, global culture, cultural practices, contemporary culture, and women’s roles in culture (The College Board, 2021). Students received a syllabus with detailed instructions concerning the modules in the culture unit (see Appendix L). Each module of the innovation was designed to create the level of interaction required for meaningful learning to occur in one or more of the skill categories (Moore, 1989). The forthcoming descriptions of each module, include how they were designed to meet Moore’s criteria for the three areas of interactivity. The

College Board (2021) recommended a maximum of twenty total days of instruction to achieve content mastery.

### **Innovation Modules**

Each module was presented to the learners via Schoology. On balance, Schoology incorporates several tools which can foster learner-learner interaction, such as a direct messaging system, a course discussion board, and links to upload interactively created projects like Prezi or a Microsoft PowerPoints Online (Schoology, 2021). Schoology is an application designed to increase learner interaction with content through tools such as the ability to access a digital textbook without internet access, the ability to view, annotate, and edit documents, PowerPoints, and other media, and the ability to access additional educational resources through a course library (Schoology, 2021). Students downloaded a zipped folder from the materials tab of Schoology and saved all the required content and instructional resources digitally. Each module was contained in an individual dated and sequenced labeled subfolder in order to lessen confusion and guide students through the modules in the proper order. Daily reminders were also sent to the learners via Schoology's updates message board as a fail-safe measure. Each module was designed to be completed within a typical class period time block of fifty-five minutes. The modules were presented synchronously to the participants during their seventh period APHG course regardless of whether students were present face-to-face or virtually distanced. This intervention was designed to supplant the interaction typically found in a traditional face-to-face instructional model. All interactions in this intervention were facilitated via the LMS Schoology rather than through direct in-person contact. According to Moore and Kearsley (2011), Schoology matched the criteria of a tool that could bridge the

transactional distance. But, determining how effectively Schoology prepared learners through its interactive tools, as reported by learners, was used in my research to determine how well Schoology meet the criteria for a system which minimized transactional distance. As a platform generally designed for asynchronous interaction, Schoology needed to provide independent learning opportunities, but through scaffolded interactions.

Scaffolded interactions were developed by the instructor who was trained on the utilization of Schoology. Schoology possesses the technology to house file uploads of webcasts, lecture casts, PowerPoint presentations, videos, audio files, and a variety of document formats including Microsoft Word and Apple Pages (Schoology, 2021). These files can then easily be disseminated at designed intervals for the students by the instructor (see Appendices M-AB). Generally, the modules provided facilitation, coaching, and opportunity for feedback which, when implemented effectively, met the criteria for bridging transactional distance (Frantz & King, 2000).

By both adopting previously used techniques in the modules, such as collaborative projects, purposeful feedback, or discussion prompts, and by having the modules reviewed by other Social Studies teachers who were familiar with Schoology, the validity of the modules, in terms of scaffolding instruction, was strengthened. This process was informal, but the modules were all reviewed, critiqued, and in some cases revised after an examination from colleagues who are familiar with Schoology, the ZPD, and the intent of this research.

In essence, if Schoology provided interaction for learners strongly in one of the three areas of interaction, it should have provided learners with the opportunity to prepare

for the APHG exam. Schoology provided a potential for all three levels of interaction (Schoology, 2021). According to Xiao (2017), this was critical because the IET lacks empirical evidence supporting that interaction in one area is sufficient for meaningful learning. With proper facilitation, an LMS can be way for instructors to provide interaction at an equivalent level as face-to-face interaction.

My research sought to gather student-supplied data concerning the interactions provided via Schoology, specifically, how well the interactions with instructor, other learners, and content were perceived during the culture unit of instruction. Learners reported via surveys, a panel group discussion, and interviews. From this data, an evaluation as to whether students perceived a higher level of interactivity from instruction provided via Schoology, which was designed to meet the criteria of the systems approach and the IET, was made, adding to the existing data on LMS efficacy.

**Current Interaction.** The lecture-discussion model is widely used in APHG classrooms (Paek, Ponte, Sigel, Braun, & Powers, 2005). This teaching method is largely instructor-centered and follows a pattern of individual student research and reflection upon textual readings. Learner-learner interaction is facilitated completely through the discussion portions of the class. For this action research, interaction was “a social exchange, communication, and cooperation among all elements in the community. In teaching-learning activities, the students may interact with peers, instructors, and contents” (Zainuddin, Hermawan, & Mahardiko, 2018, p. 90). In order to be considered enhanced interactivity Moore (1989) requires additional time, feedback (if possible), and reflection in at least one category, learner-content, learner-instructor, and learner-learner,

of instruction. The following modules are designed to enhance interactivity in at least two of the three areas.

**Pre-Test.** Prior to instruction a pre-test on APHG culture content was issued to all students in order to follow the innovation with a posttest (see Appendices B and AB).

**Module One.** An introductory five-minute video of the instructor began the module in which directives were given to the learners. The video directed students to textually read pages 112-113 and then respond to a series of prompts, listed as 4K1 #1-10. The prompts and a link to the digital text were posted in the Module One folder (see Appendix M). After reading and completing the prompts individually, learners worked with their two-other-student reading teammates. These teams were predetermined by the instructor and remained consistent throughout the innovation modules. Based on the class size there were seven teams. The reading teammates were required to meet digitally through Microsoft Teams during the class period. Students had to move to amply spread-out workspaces, assuring privacy and reducing overlapping conversations almost completely. Students discussed an assigned prompt that asked the learners to hypothesize a solution to a cultural situation. Students also self-, and peer-assessed the collaboration using an evaluative rubric (see Appendix C). Teammates were directed to post their consensus hypothesis to the Schoology commentary board where the other teams had posted hypotheses. All students had to post a reaction or a reply to two other group posts. Posts were assessed using the discussion post rubric (see Appendix D). The purpose of this module was to address the skill categories of folk versus popular culture patterns and diffusion methods through interactivity between learner-content and learner-learner.

This module replaced the traditional interactivity by requiring learner-content interaction above simply reading the text. Outside of lecture-discussion in class, most students traditionally passively read the text and do not actively participate in class discussions. According to Moore (1989) requiring collaboration with prompts that require explanatory and descriptive analysis increased content and peer interaction. The learner-learner collaboration interactivity was enhanced by requiring collaboration and consensus building as well as peer-evaluation in order to complete the task. Additionally, discussion board reflection and commentary were required.

**Module Two.** The first part of the module consisted of a lecture-cast. Students downloaded and viewed the five-slide fifteen-minute 4K1.1 lecture cast (see Appendix N). Two self-guided progress checks were incorporated into the lecture-cast. Following the cast students posted a comment and or question to the Schoology commentary board and were required to email the instructor the results of the progress checks (screenshots) accompanied by an explanation and correction for missed items. Next, in a five-minute video the instructor gave directives to the learners. The video directed students to textually read pages 114-115 and then respond to a series of prompts, listed as 4K1 #11-21. The prompts and a link to the digital text were posted in the Module Two folder. After reading and completing the prompts individually, learners worked with their two-other-student reading teammates. The reading teammates were required to meet digitally through Microsoft Teams during the class period. Students discussed an assigned prompt that asked the learners to hypothesize a solution to a cultural situation. Teammates were directed to post their consensus hypothesis to the Schoology commentary board where the other teams posted hypotheses. All students had to post a reaction or a reply to two

other group posts. Posts were assessed using the discussion post rubric. The purpose of this module was to address the skill categories of origins and diffusion through interactivity between learner-instructor, learner-content, and learner-learner.

Again, this module replaced the current interactivity by requiring learner-content interaction above simply reading the text and an explanatory and descriptive analysis. Learner-instructor interaction occurred both with a self-paced lecture cast as well as the increased required communication and feedback from the instructor, which again, according to Moore (1989) increased the levels of interactivity.

**Module Three.** The first part of the module (see Appendix O) consisted of a multiple-choice assessment quiz posted to the Schoology assignments tab. All students had seven minutes to complete the assessment. Following, students downloaded and viewed the four-slide fifteen-minute 4K1.2 lecture cast. Two self-guided progress checks were incorporated into the lecture-cast. Following the cast students posted a comment and or question to the Schoology commentary board and were required to email the instructor the results of the progress checks (screenshots) accompanied by an explanation and correction for missed items. Additionally, the students posted a comment and or question to the Schoology commentary board. Next, in a five-minute video the instructor gave directives to the learners. The video directed students to textually read page 116-117 and then respond to a series of prompts, listed as 4K1 #22-26. The prompts and a link to the digital text were posted in the Module Three folder. After reading and completing the prompts individually, learners worked with their two-other-student reading teammates. The reading teammates were required to meet digitally through Microsoft Teams during the class period. Students discussed an assigned prompt that asked the learners to



hypothesize a solution to a cultural situation. Teammates were directed to post their consensus hypothesis to the Schoology commentary board where the other teams posted hypotheses. All students must post a reaction or a reply to two other group posts. Posts were assessed using the discussion post rubric. The purpose of this module was to address the skill categories of spatial organization of culture and cultural production regions through enhanced interactivity between learner-instructor, learner-content and learner-learner as described by Moore (1989).

**Module Four.** The first part of the module (see Appendix P) consisted of a multiple-choice assessment quiz posted to the Schoology assignments tab. All students had seven-minutes to complete the assessment. Following, students downloaded and viewed the eight-slide ten-minute lecture cast. One self-guided progress check was incorporated into the lecture-cast. Following the cast students posted a comment and or question to the Schoology commentary board. Next, in a five-minute video the instructor gave directives to the learners. The video directed students to textually read page 118-119 and then respond to a series of prompts, listed as 4K1 #27-32. The prompts and a link to the digital text were posted in the Module Four folder. After reading and completing the prompts individually, learners worked with their two-other-student reading teammates. The reading teammates were required to meet digitally through Microsoft Teams during the class period. Students collaboratively completed a provided dataset from the map in the text on page 120. Teammates were directed to post their dataset to the Schoology commentary board where the other teams had posted their datasets. All students must post a reaction or a reply to two other group posts. Posts were assessed using the discussion post rubric.

The purpose of this module was to address the skill categories of spatial organization of culture and cultural production regions through enhanced interactivity, as described by Moore (1989) between learner-instructor, learner-content and learner-learner as evidenced through the lecture-cast, reading task, and collaboration

**Module Five.** This was the first of only two multiday modules (see Appendix Q). Students spent two days researching, collaboratively developing, and presenting an assigned type of cultural conflict. Student reading teams created a PowerPoint presentation based off of directives found in the Module Five folder (see Appendix E for the rubric) highlighting the cultural conflict type and presented it via Microsoft Teams to classmates. During the development process the instructor served as a consultant, but the primary development was provided by the reading team members. The purpose of this module was to address the skill categories of spatial organization of culture and cultural production regions through interactivity between learner-content and learner-learner. Creating and presenting an informative PowerPoint increases this interactivity according to Moore (1989).

**Module Six.** In a five-minute video the instructor gave directives to the learners. The video directed students to textually read pages 120-121 and then respond to a series of prompts, listed as 4K1 #33-41 (see Appendix R). The prompts and a link to the digital text were posted in the Module Six folder. After reading and completing the prompts individually, learners worked with their two-other-student reading teammates. The reading teammates were required to meet digitally through Microsoft Teams during the class period. Students discussed an assigned prompt that asked the learners to hypothesize a solution to a cultural situation. Teammates were directed to post their

consensus hypothesis to the Schoology commentary board where the other teams had posted hypotheses. All students had to post a reaction or a reply to two other group posts. Posts were assessed using the discussion post rubric. The purpose of this module was to address the skill category of cultural hearths model through interactivity between learner-content and learner-learner as described by Moore (1989).

**Module Seven.** The first part of the module (see Appendix S) consisted of a multiple-choice assessment quiz posted to the Schoology assignments tab. All students had seven minutes to complete the assessment. Following, students downloaded and viewed the fourteen-slide, thirty-minute 4K2 lecture cast found in the Module Seven folder. Three self-guided progress checks were incorporated into the lecture-cast. Following the cast, students posted a comment and or question to the Schoology commentary board and were required to email the instructor the results of the progress checks (screenshots) accompanied by an explanation and correction for missed items. The purpose of this module was to address the skill categories of cultural hearths through enhanced interactivity between learner-instructor and learner-content as described by Moore (1989).

**Module Eight.** The first part of the module (see Appendix T) consisted of a multiple-choice assessment quiz posted to the Schoology assignments tab. All students had seven minutes to complete the assessment. Following, students downloaded and viewed the eighteen slide thirty-minute lecture cast found in the Module Eight folder. One self-guided progress check was incorporated into the lecture cast. Following the cast students posted a comment and or question to the Schoology commentary board and were required to email the instructor the results of the progress checks (screenshots)

accompanied by an explanation and correction for missed items. Students posted a comment and or question to the Schoology commentary board. The purpose of this module was to address the skill category of cultural origins through interactivity between learner-instructor and learner-content as described by Moore (1989).

**Module Nine.** In a five-minute video the instructor gave directives to the learners. The video directed students to textually read pages 122-125 and then respond to a series of prompts, listed as 4K2 #1-15 (see Appendix U). The prompts and a link to the digital text were posted in the Module Nine folder. After reading and completing the prompts individually, learners worked with their two-other-student reading teammates. The reading teammates were required to meet digitally through Microsoft Teams during the class period. Students discussed an assigned prompt that asked the learners to hypothesize a solution to a cultural situation. Teammates were directed to post their consensus hypothesis to the Schoology commentary board where the other teams had posted hypotheses. All students had to post a reaction or a reply to two other group posts. Following this, students downloaded and viewed the six-slide ten-minute 4K2.1 lecture cast. One self-guided progress check was incorporated into the lecture-cast. Following the cast students posted a comment and or question to the Schoology commentary board and were required to email the instructor the results of the progress checks (screenshots) accompanied by an explanation and correction for missed items. Students posted a comment and or question to the Schoology commentary board. Posts were assessed using the discussion post rubric. The purpose of this module was to address the skill categories of the global system of culture and the consequences of contemporary conflicts through

interactivity between learner-content, learner-learner, and learner instructor as described by Moore (1989).

**Module Ten.** In a two-minute video the instructor gave directives to the learners to download and view the twenty slide forty-minute 4K2.1-3 lecture cast. Three self-guided progress check were incorporated into the lecture-cast (see Appendix V). Following the cast students posted a comment and or question to the Schoology commentary board and were required to email the instructor the results of the progress checks (screenshots) accompanied by an explanation and correction for missed items. Students posted a comment and or question to the Schoology commentary board. Posts were assessed using the discussion post rubric. Next, students were directed at the end of the cast to textually read pages 126-131 and then respond to a series of prompts, listed as 4K2 #16-33. The prompts and a link to the digital text were posted in the Module Ten folder. After reading and completing the prompts individually, learners worked with their two-other-student reading teammates. The reading teammates were required to meet digitally through Microsoft Teams during the class period. Students discussed an assigned prompt that asked the learners to hypothesize a solution to a cultural situation. Teammates were directed to post their consensus hypothesis to the Schoology commentary board where the other teams had posted hypotheses. All students had to post a reaction or a reply to two other group posts. The purpose of this module was to address the skill categories of the cultural revolutions through increased interactivity between learner-content, learner-learner, and learner instructor as described by Moore (1989).

**Module Eleven.** In a two-minute video the instructor directed the students to textually read pages 132-137 and then respond to a series of prompts, listed as 4K3 #1-28

(see Appendix W). The prompts and a link to the digital text were posted in the Module Eleven folder. After reading and completing the prompts individually, learners worked with their two-other-student reading teammates. The reading teammates were required to meet digitally through Microsoft Teams during the class period. Students discussed an assigned prompt that asked the learners to hypothesize a solution to a cultural situation. Teammates were directed to post their consensus hypothesis to the Schoology commentary board where the other teams had posted hypotheses. All students had to post a reaction or a reply to two other group posts. The purpose of this module was to address the skill categories of the challenges of culture clash and women's roles in culture through increased interactivity between learner-content and learner-learner according to Moore (1989).

**Module Twelve.** In a five-minute video the instructor directed the students to read the following case study posted in the Module Twelve folder: *Cultural Extras* (see Appendix X). Learners then responded to a series of prompts, listed as Case Study responses. After reading and completing the prompts individually, learners worked with their two-other-student reading teammates. The reading teammates were required to meet digitally through Microsoft Teams during the class period. Students discussed an assigned prompt that asked the learners to hypothesize a solution to a cultural situation. Teammates were directed to post their consensus hypothesis to the Schoology commentary board where the other teams had posted hypotheses. All students needed to post a reaction or a reply to two other group posts. The purpose of this module was to address the skill categories of the challenges of contemporary culture and cultural

revolutions through increased interactivity between learner-content and learner-learner as described by Moore (1989).

**Module Thirteen.** In a two-minute video the instructor directed the students to textually read pages 138-141 and then respond to a series of prompts, listed as 4K4 #1-23. The prompts and a link to the digital text were posted in the Module Twelve folder (see Appendix Y). After reading and completing the prompts individually, learners worked with their two-other-student reading teammates. The reading teammates were required to meet digitally through Microsoft Teams during the class period. Students discussed an assigned prompt that asked the learners to hypothesize a solution to a cultural situation. Teammates were directed to post their consensus hypothesis to the Schoology commentary board where the other teams had posted hypotheses. All students had to post a reaction or a reply to two other group posts. The purpose of this module was to address the skill categories of the challenges of contemporary culture and women in culture through increased interactivity between learner-content and learner-learner as described by Moore (1989).

**Module Fourteen.** This module took two days (see Appendix Z). In a five-minute video the instructor directed the students to view edited vignettes of the 2003 documentary by Mylan and Schenk *the Lost Boys of Sudan* posted in the Module Thirteen folder. Accompanying prompts were completed by students as they viewed. After viewing and completing the prompts individually, learners worked with their two-other-student reading teammates. The reading teammates were required to meet digitally through Microsoft Teams during the class period. Students discussed an assigned prompt that asked the learners to hypothesize a solution to a cultural situation seen in the

documentary. Teammates were directed to post their consensus hypothesis to the Schoology commentary board where the other teams had posted hypotheses. All students had to post a reaction or a reply to two other group posts. The purpose of this module was to address the skill categories of the challenges of contemporary culture and consequences of cultural practices through increased interactivity between learner-content and learner-learner as described by Moore (1989).

**Module Fifteen.** In a five-minute video the instructor directed the students to complete their culture project. Each student had been assigned a country on Earth in order to apply geographic concepts. The directions and rubric were posted in the Module Thirteen folder (see Appendix AA). As students completed their project, they were required to meet digitally through Microsoft Teams during the class period with the instructor in order to view and critique the learners' PowerPoints. After the critique and revision projects were uploaded to Schoology for whole class review. The purpose of this module is to address all skill categories of the culture unit through increased interactivity between learner-content and learner-instructor as described by Moore (1989).

**Module Sixteen.** Students found a link to a digital culture unit exam consisting of both multiple choice and free-response questions in the Module Sixteen folder (see Appendices B and AB). Students completed the exam via Schoology's assessment platform. The directions and the exam can be found in Appendix B. As students completed their exam, they had completed all modules and had been assessed on all skill categories. This served as the quantitative posttest.



## **Post-innovation Procedures**

In the week after the culture unit, the participants who had consented to the innovation were asked to complete a Likert-type survey (see Appendix F). The survey measured student perceptions of the LMS Schoology as an interactive instructional tool. This survey addressed student perceptions of the innovation. This survey, as well as a panel group discussion and individual interviews attempted to measure how well the innovation provided interactivity as described by Moore (1989) in order to create a digital ZPD as describe by Vygotsky (1978).

## **Data Collection Methods**

For this mixed methods action research, two quantitative method of data collection were utilized: a learner survey provided before and after the innovation and a pre/posttest of learning. Additionally, two qualitative methods were utilized: a panel group of voluntary participants and one-on-one researcher-learner interviews. These data provided the most reliable information for studying a classroom sized population (Creswell & Creswell, 2018; Mertler, 2017). Creswell and Creswell (2018, p. 253) state, “researchers typically gather multiple forms of data, such as interviews, observations, documents, and audiovisual information rather than rely on a single data source.” The study evaluated the perceptions of APHG learners toward the LMS Schoology and its usage, taking into consideration learner interactions with the instructor, other learners, and the content (see Table 3.2 for details).

**Table 3.2** *Research Questions*

<b>Research Questions</b>	<b>Data Sources</b>
1. What are learners' perceptions of the learner-instructor, learner-learner, and learner-content interactions presented via the Schoology interactive modules in their culture unit of instruction?	<ul style="list-style-type: none"><li>• Panel group</li><li>• One-on-one interview protocol</li></ul>
2. What barriers are reported by students that hinder meaningful learner-instructor, learner-learner, and learner-content learning while using the Schoology interactive modules in the culture unit?	<ul style="list-style-type: none"><li>• Pre/postsurvey</li><li>• One-on-one interview protocol</li></ul>
3. To what extent do students' perceptions of Schoology change after receiving increased interactive lessons presented through the Schoology interactive modules during the culture unit?	<ul style="list-style-type: none"><li>• Pre/postsurvey</li><li>• One-on-one interview protocol</li></ul>
4. To what extent does student learning, as measured by a culture unit assessment, increase, or decrease after the LMS driven instructional innovation?	<ul style="list-style-type: none"><li>• Pre- and posttest</li></ul>

### **Quantitative Methods**

The surveys were developed using the website SurveyMonkey.com. Questions were written to effectively gauge learners' self-analysis on their Schoology provided interactions with the instructor, other learners, and the course content.

**Learner Surveys.** A series of self-reporting surveys were made available to all learners enrolled in APHG. The surveys were offered both prior to and after the innovation. The surveys were an adaptation of the interactivity measurements utilized in the previous studies of Lane (2017) and Mbwesa (2014). The initial survey consisted of questions designed to measure learners' general perceptions of the interactions provided via the LMS site Schoology (Plonski, 2021). Each question could be responded to using a Likert-type scale. For example, learners were asked to rate the frequency of Schoology interactions during a typical APHG unit: "How often do you, on average, discuss content digitally with classmates (or course updates, homework postings, or learner collaborative posts) during this unit of study (Plonski, 2021)?" Learners responded to the prompt by selecting from a scale: (1) everyday, (2) almost every day, (3) sometimes, (4) rarely, or (5) never (Plonski, 2021). In another example, learners were asked to rate the usefulness of Schoology interactions with the instructor during a typical unit: "When you access instructor-created posts on Schoology, how useful do you find the learner-instructor interaction" (Plonski, 2021)? Learners responded to the prompt by selecting from a scale: (1) extremely useful, (2) moderately useful (3) occasionally useful (4) rarely useful, or (5) never useful (Plonski, 2021).

After the innovation, presented specifically during the culture unit, a second survey was presented where each question could be responded to using a Likert-type scale, but the questions/prompts were specified to the culture unit during the innovation. For example, learners were asked to rate the frequency of Schoology interactions during the culture unit: "How often do you, on average, discuss content digitally with classmates (or course updates, homework postings, or learner collaborative posts) during this unit of

study (Plonski, 2021)?" Learners responded to the prompt by selecting from a scale: (1) everyday, (2) almost every day, (3) sometimes, (4) rarely, or (5) never (Plonski, 2021). In another example, learners were asked to rate the usefulness of Schoology interactions with the instructor during the culture unit: "When you access instructor-created posts on Schoology, how useful do you find the learner-instructor interaction (Plonski, 2021)?" Learners responded to the prompt by selecting from a scale: (1) extremely useful, (2) moderately useful (3) occasionally useful (4) rarely useful, or (5) never useful (Plonski, 2021).

The surveys, which can be viewed in their entirety in Appendices A and F, were used because a strength of surveys is that they offer a simple, yet effective way to gather quantitative data on a relatively large population in a quick and efficient manner, and surveys provide insight into respondents' attitudes and perceptions of an innovation or program like Schoology (Mertler, 2017). Although useful, surveys may have several limitations, such as responding inconsistently or in a socially desirable manner. Therefore, multiple measures need to be used (Dursun, Donmez, & Akbulut, 2018).

According to Mertler (2017), to ensure that the data presents the information that I intended to measure, validity had to be assured. In order to assure validity, I had the survey reviewed by four fellow faculty members, a post-graduate student, and a college professor. Additionally, an internal consistency test, the Kuder-Richardson-20 (KR-20), was conducted with the posttest data.

**Pretest/posttest of Learning.** A pre- and posttest was issued to measure how effective the modules were at delivering required content needed to master the APHG culture unit (see Appendices B and AB). These tests were validated through their creation

and usage by the College Board, the agency which develops, scores, and acknowledges student success in APHG (College Board, 2021). An internal consistency test, the Kuder-Richardson-20 (KR-20), was conducted with the posttest data.

### **Qualitative Methods**

To enhance the data and address the limitations of purely quantitative results, a qualitative panel group and interviews were utilized (Dursun et al., 2018).

**Panel Group.** Following the APHG culture unit, learners were invited to voluntarily attend a meeting, either face-to-face or facilitated via Schoology or another video platform. The panel group meeting lasted approximately 20 minutes. The group of learners was provided with several semi-structured discussion points centering on the interactions experienced during their APHG culture unit. The role of the researcher was that of an observer and active participant in these panel groups. As the learners' teacher, and as an action researcher, my participation was used to guide the panel group's discussion; however, when the learners were properly engaged with their discussion topics, then I allowed the group to discuss and recorded data as an observer. The group members were enrolled in the researcher's class; however, participation in or the results of the study had no bearing on learners' scores, which ensured that no ethical violations developed and that prior experience with the learners did not shape the results of the study. The observation of the discussion was annotated using a three-tiered annotation field note form. One column recorded exactly what the learners were reporting or discussing, while the other column of annotations was for my speculations, comments, or other memos. The annotatable observation form can be found in Appendix G.

A panel group was chosen as a data source because research shows that observation of such a group is an unobtrusive but a rich opportunity to view learners engaged with the subject of research, in this case the interactions provided through Schoology (Elmendorf & Song, 2015; Liang, 2015). Observations of the discussion were made by the researcher/instructor who has taught this particular course for ten years and is employed by the College Board as an APHG Exam scorer. The observations were annotated in memos that augmented the data that was coded and analyzed. During the observations, evidence of specific student attitudes and behaviors concerning interaction was examined (see Table 3.3). The data was analyzed using the thematic development method described by Mertler (2017). After the data was coded and filtered into categories, information that shares similar evaluations of the interactions provided via Schoology were used to create themes as described by Saldana and Omasta (2017) that aligned to the qualitative research questions, as well as a category developed into themes from data that was contrary to the research hypothesis.

**One-on-one Interviews.** Interviews were conducted individually with five learners who had given assent and consent and who had been made aware of the Institutional Review Board's (IRB) policies on human subjects (see Appendix H). Interviewing a participant who had enrolled in APHG and who had access to the LMS was critical to understanding the advantages and disadvantages of the interactions as seen by learners and helped to answer the research question as to what extent the interactions provided via Schoology aided in the mastery of the APHG culture unit. The interview protocol is an adaptation of Murphy and Rodriguez's (2008) instrument measuring interactivity based upon Moore and Kearsley's (2011) interactivity. The researcher asked

questions (see Table 3.4) separately in a 30-minute time frame to the learners who were selected as a purposeful group ( $n = 5$ ) from the digital participant roster in order to reflect the general characteristics of typical 9<sup>th</sup> grade APHG students in my setting; all panelist provided consent and assent forms (see Appendices J and K). The interview was semi-structured and included both sub-questions and probing questions. Semi-structured interviews, although difficult to keep on topic, allowed for freer, more casual conversations (Davies & Beaumont, n.d.).

**Table 3.3** *Panel Group Discussion Observation Protocol Alignment*

<b>Research Question</b>	<b>Semi-Structured Questions</b>
What are learners' perceptions of the learner-instructor, learner-learner, and learner-content interactions presented via the Schoology interactive modules in their culture unit of instruction?	Describe/and provide an example of the effectiveness of the student-teacher interaction provided  Describe/and provide an example of the effectiveness of the student-to-other-student interaction provided  Describe/and provide an example of the effectiveness of the student-to-content interaction provided
What barriers are reported by students that hinder meaningful learner-instructor, learner-learner, and learner-	Describe how you might change the modules (including its layout and format)

Research Question	Semi-Structured Questions
<p>content learning while using the Schoology interactive modules in the culture unit?</p>	<p>Describe the modules in terms of their ease of use (which parts were clear or unclear)</p> <p>Please illustrate a time when you were aware of the enhanced interactions during the cultural unit. How was this different from previous course interactions? Please provide a specific example.</p>
<p>Do students' perceptions of Schoology change after receiving increased interactive lessons presented through the Schoology interactive modules during the culture unit?</p>	<p>Please discuss past experiences using Schoology and compare them to the current experience. Describe the specific differences.</p> <p>Did you notice any changes in the interaction as you progressed through the unit?</p> <p>List any other thoughts or comments (open-ended)</p>

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*Note.* Questions adapted from “Revisiting Transactional Distance Theory in a Context of a Web-Based High-School Distance Education” by E. Murphy and M.A.R. Rodriguez-Manzanares, 2008, *Journal of Distance Education*, 22(2), p. 1-14.



**Table 3.4** *Research Question-Interview Protocol Alignment*

<b>Research Questions</b>	<b>Interview Questions</b>
<p>What are learners’ perceptions of the learner-instructor, learner-learner, and learner-content interactions presented via the Schoology interactive modules in their culture unit of instruction?</p>	<p>Tell me your perceptions of Schoology’s instructor-student interactions during the culture unit?</p> <p>How often did you interact with the instructor?</p> <p>Describe to me how the interactions helped or hindered your comprehension?</p> <p>Based on experience, what is your evaluation of the Schoology- based learner-instructor interaction? Please consider positive and negative impressions.</p> <p>Tell me your perceptions of Schoology’s learner-learner interactions during the culture unit?</p> <p>How often did you interact with other learners?</p> <p>Describe to me how the interactions helped or hindered your comprehension?</p>

Research Questions	Interview Questions
	Based on your experiences, what is the single-most beneficial advantage of Schoology-based learner-learner interaction?
	Based on your experiences, what is the single-most challenging aspect of Schoology-based learner-learner interaction?
	Tell me your perceptions of Schoology's learner-content interactions during the culture unit?
	How often and in what way did you interact with the content?
	Describe to me how the interactions helped or hindered your comprehension?
	Based on your experiences, what is the single-most beneficial advantage of Schoology-based learner-content interaction?
	Based on your experiences, what is the single-most challenging aspect of

Research Questions	Interview Questions
<p>What barriers are reported by students that hinder meaningful learner-instructor, learner-learner, and learner-content learning while using the Schoology interactive modules in the culture unit?</p>	<p>Schoology-based learner-content interaction?</p> <p>Tell me about any technical difficulties that you had with Schoology?</p> <p>How did your previous usage of LMS's like Schoology prepare you for the interactive culture unit?</p> <p>Which of the three interactive areas was the most difficult to produce through Schoology?</p> <p>Any additional comments on the barriers to interaction that exist while using Schoology?</p>
<p>To what extent do students' perceptions of Schoology change after receiving increased interactive lessons presented through the Schoology interactive modules during the culture unit?</p>	<p>Tell me if the culture modules changed your perceptions of Schoology? If yes, then how?</p> <p>Would you like to receive more interactive lessons via Schoology?</p> <p>Why or why not?</p>

Research Questions	Interview Questions
	<p>What advice would you give to other students engaged in interactive Schoology lessons?</p>
	<p>What advice would you give to teachers trying to create interactive Schoology lessons?</p>

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*Note.* Questions adapted from “Revisiting Transactional Distance Theory in a Context of a Web-Based High-School Distance Education” by E. Murphy and M.A.R. Rodriguez-Manzanares, 2008, *Journal of Distance Education*, 22(2), p. 1-14.

The interview protocol, found in Appendix I, was designed to gauge variables from the participants, such as: how often they interact via Schoology with the instructor, other learners, and content; how the LMS is personally advantageous or disadvantageous to unit mastery; how the LMS has personally affected their interactions; and to what degree the interviewees feel that their interactions on the LMS aided them during the unit of study.

The interviews were conducted in a face-to-face setting. Those who were willing to participate and who had given informed consent met with the researcher at a prearranged time. A script was used to open the questioning:

Hello, thanks for consenting to be a part of this research and for participating in this interview. Before we begin, I’d like to first have you affirm that you indeed do agree to participate. Next, I need to ask a few demographic questions, and finally, I want to review the purpose of this research and tell you exactly what procedures and types of questions I will be asking. After I will begin with a series

of questions, but please feel free to interject with comments or questions at any point.

Open-ended questions were asked. The researcher recorded the responses both manually, on the three-tiered notebook which allowed for annotations and later reflection, and digitally through the audio recording application of a MacBook Air. Learner responses to interviews were transcribed and analyzed using descriptive and thematic coding following recommendations by Saldaña (2013).

The interviews concluded after approximately 30 minutes with the caveat that follow-up questioning for some interviews added a marginal amount of time. The interviewees were thanked and asked if they had any follow up questions.

I chose to interview in a semi-structured manner for my fourth data source because it allowed me to prepare questions that aligned with my research questions, but also allowed learners to provide open-ended detail (Mertler, 2017). Although learners were implicitly asked about the research questions, less specific follow-up questions such as, “How do you think your ability to master the content was impacted by the LMS interactions, and how so?” were asked. Another example from the interview protocol was “How would you improve the interactions with the instructor, or other learners, or the content on Schoology?” The post-intervention interviews were held with a random sample of five learners, who have agreed to participate and given consent, to ascertain their evaluation of Schoology in the three areas of interaction, and to determine and record any recommendations for improved Schoology interaction in subsequent units of instruction. The interviews were coded, and again using the method describe by Mertler (2017), themes were derived. Code weaving, as described by Saldaña and Omasta (2017)

focused on the negative, positive, and neutral evaluations of Schoology in the three areas of interaction that was recorded in the interview data. For example, when Sara (an anonymized learner) responded that Schoology was “very helpful” with providing opportunities for learner-learner interactions, that comment was coded as “L-L+.”

### **Data Analysis**

Research questions were investigated using various sources of data, as displayed in the research alignment table (see Table 3.5). This mixed methods research study measured both quantitative and qualitative data. Quantitative data consisted of an instructor/researcher-generated pre- and post-innovation survey and a pre- and post-innovation content assessment. Quantitative data were analyzed with descriptive and inferential statistics as appropriate. Qualitative data consisted of an observed panel group and a series of interviews with select participants. Qualitative data were analyzed through multiple rounds of inductive analysis. All the data sources, as a part of triangulation, corroborated and supported the data of the other sources. A full description of the analyses processes is included in the following Chapter 4.

**Table 3.5** *Research Questions, Data Sources, and Data Analysis Alignment Table*

<b>Research Questions</b>	<b>Data Source(s)</b>	<b>Method of Analysis</b>
1. What are learners’ perceptions of the learner-instructor, learner-learner, and learner-content interactions presented via the Schoology interactive	<ul style="list-style-type: none"> <li>• Pre-Post Survey</li> <li>• Panel group</li> <li>• Interview protocol</li> </ul>	<ul style="list-style-type: none"> <li>• Descriptive statistics</li> <li>• Paired samples <i>t</i>-test</li> <li>• Inductive analysis</li> </ul>

Research Questions	Data Source(s)	Method of Analysis
modules in their culture unit of instruction?		
2. What barriers are reported by students that hinder meaningful learner-instructor, learner-learner, and learner-content learning while using the Schoology interactive modules in the culture unit?	<ul style="list-style-type: none"> <li>• Pre-Post Survey</li> <li>• Panel group</li> <li>• Interview protocol</li> </ul>	<ul style="list-style-type: none"> <li>• Descriptive statistics</li> <li>• Paired <i>t</i>-test</li> <li>• Inductive analysis</li> </ul>
3. To what extent do students' perceptions of Schoology change after receiving increased interactive lessons presented through the Schoology interactive modules during the culture unit?	<ul style="list-style-type: none"> <li>• Pre-Post Survey</li> <li>• Panel group</li> <li>• Interview protocol</li> </ul>	<ul style="list-style-type: none"> <li>• Descriptive statistics</li> <li>• Paired samples <i>t</i>-test</li> <li>• Inductive analysis</li> </ul>
4. To what extent does student learning, as measured by a culture unit assessment, increase, or decrease after the LMS driven instructional innovation?	<ul style="list-style-type: none"> <li>• Pre-Posttest</li> </ul>	<ul style="list-style-type: none"> <li>• Descriptive statistics</li> <li>• Paired samples <i>t</i>-test</li> </ul>

## **Data Aggregation**

Following the thematic coding the multiple sources of data were combined to form aggregate results. The data sources corroborated and informed one another, but they did uncover some disparaging results. The results of the data analysis are discussed through a thick and rich description and through a results table in the Results section.

## **Procedures**

This mixed methods research took place in distinct stages, as displayed in Table 3.6. Stage 1 was participant identification. Stage 2 introduced the innovation to the participants. Stage 3 focused on data collection. Stage 4 was data analysis.

### **Pre-innovation Procedures**

In the week prior to the beginning of the culture unit the participants who had consented to the innovation were asked to complete a Likert-type survey (see Appendix A). The survey measured student perceptions of the LMS Schoology as an interactive instructional tool. In past surveys, previous students had reported that Schoology did not provide sufficient interactions to allow for meaningful learning to occur (Plonski, 2018). This innovation included increased interactivity as described by Moore (1989) to create a digital ZPD as describe by Vygotsky (1978).

### **Stage 1 Participant Identification**

Students enrolled in APHG at Springdale High School constituted the pool of potential participants. To select the participants, first, an informative presentation (face-to-face or digital) was offered to the students and their parents, who are enrolled in APHG at the setting.



**Table 3.6** *Procedures and Timeline*

<b>Stage</b>	<b>Time</b>	<b>Researcher Action</b>
Participant identification	3-weeks	<ul style="list-style-type: none"><li>• Introductory meeting</li><li>• Participant selection</li><li>• Consent/assent received</li><li>• Pre-survey issued</li></ul>
Innovation	3-weeks	<ul style="list-style-type: none"><li>• Interactive Schoology based lessons</li><li>• Culture unit of instruction</li></ul>
Data collection	2-weeks	<ul style="list-style-type: none"><li>• Post-survey</li><li>• Panel discussion</li><li>• Individual interviews</li></ul>
Data analysis	15-weeks	<ul style="list-style-type: none"><li>• Paired <i>t-test</i></li><li>• Descriptive statistics formulated</li><li>• Coding data into themes</li><li>• Rich and thick description</li></ul>

An invitation was sent using the Bright Arrow Parent/Student mass email system on the first day of the semester for students (see Appendix J). This system distributes emails to all parties and is frequently updated in order to have the most current student and parent data. The informative meeting took place one-week later after school in the fine arts center. The nature of this presentation was to inform potential participants of the purpose of the research and to obtain assent and consent. Consent forms (see Appendix K) were distributed at the meeting and in school to all students in an attempt to include

students whose parents did not attend the meeting. Due to the uncertain nature of mass gatherings all consent forms, meeting notifications, and other pertinent information were available to all stakeholders at any time during the research upon request. Additionally, duplicates of the information concerning the nature of the study were provided in email and letter form the day following the meeting.

Consent forms were collected during the week immediately after the meeting. A one-week return deadline was set to both encourage the return of the forms and to finalize the study participants. Participants and their parents/guardians were notified via email of their selection. All aspects of the study were intended to be transparent. This openness with the intent of the study avoided the need for a cover story, which in an educational setting could have been perceived as unethical. Participation was voluntary, and no repercussions affected students who do not choose to participate. Participants were encouraged to complete an online survey that measured through Likert-type scaled questions their individual experience in terms of interaction with their instructors, other learners, and content through the LMS Schoology during a one-week window following the collection of participant forms. Thus, the three-week participant selection window consisted of an email invitation followed by a meeting a week later. Next potential participants had a week to return the required consent forms. Last, after consenting participants had returned their forms, they had a week to complete the Likert-type scale pretest survey measure.

## **Stage 2 Innovation**

The students were instructed in the culture unit through the LMS Schoology. The instruction sought to increase learner-instructor, learner-learner, and learner-content interactions in order to meet the requirements of the ZPD theory of learning. Vygotsky in 1978 explained through the ZPD that learning is dependent upon social interactions. The ZPD was used as a benchmark in this study as an evaluative measure of Schoology's ability to foster the interactions needed to expand learning opportunities. Additionally, instructional strategies that enhanced online interactive opportunities for APHG students using Schoology were based on the systems approach of Moore and Kearsley (2011) and the interaction equivalence theorem (Miyazoe & Anderson, 2010). In order to accommodate increased interactivity, the culture unit featured several activities during the two-weeks of instruction. Eight self-paced research activities that were completed via textual reading, reflective posting, and instructor feedback served as learner-instructor and learner-content enhancement. Each of the eight research activities were completed by the day following its assignment to students. Four lecture casts with interactive annotation and reflective actions were posted for student at select stages of the cultural unit. Each of the four lecture casts were completed by the day following their assignment to students This served as an enhanced learner-content and learner-instructor interactivity. One content-based application project was constructed during the two-week unit enhancing learner-content interaction. This project was due at the end of the two-week unit. One collaborative activity, including a visual and written report, served to enhance learner-learner interaction. This activity was due one-week into the two-week unit of instruction.

### **Stage 3 Data Collection**

Participants completed an online survey that measured through Likert-type scaled questions their individual experience in terms of interaction with the instructor, other learners, and content during instruction in the culture unit. This survey was distributed immediately after the culmination of the culture unit and was expected to be completed by participants within a one-week time window. This served as post-innovation data used as a comparison with the initial survey. Next, during the week following the end of the unit, the instructor/researcher observed the students who had agreed to participate in a panel discussion and recorded data concerning student behavior, especially their attitudes concerning interaction through Schoology. These students were the panelists involved in the study, meaning their survey responses were analyzed and coded by the researcher following the discussions. The discussions were scheduled within a week of completing the culture unit in order to provide current data while accommodating student schedules. A three-tiered annotation system was used to gather student perceptions as well as allow for the researcher to include notes or extrapolations. The panel was audio recorded and transcribed through transcription technology in order to allow for researcher review. Last, two weeks after the end of the unit, a series of individual interviews were held with the five learners. These students were interviewed by the researcher in areas concerning the value of the interactions provided via Schoology in conjunction with the APHG culture unit. Ten questions were asked in order to understand and record student perceptions of their interactions. Again, a three-tiered annotation system was used to gather student perceptions and the panel was audio recorded and transcribed through transcription technology.

## **Stage 4 Data Analysis**

All survey, interview, and panel discussion observation data were analyzed to determine whether the research had concluded that interaction provided via Schoology is meaningful and is viewed as sufficient by learners, despite barriers or challenges to Schoology usage. Qualitative data from the panel discussions and interviews was transcribed, then entered into Delve software for analysis. The data was coded in multiple cycles to help ensure data integrity. Derived codes were used to sort the data into categories which was then sorted thematically. Afterwards, the results were interpreted by the researcher and were incorporated in a thick and rich narrative description. Feedback from the participants was included in the narrative.

Quantitative analysis included a paired *t-test* of the pre- and post-innovation Likert-type survey responses. Survey responses were entered into a spreadsheet. Scores were reviewed in search of anomalies and then tested through statistical procedures. Descriptive statistics gathered from the survey responses (mean, median, and mode) were used to generate inferences for the setting and participants. A discussion section later addresses whether the research hypothesis was supported or refuted, explains the significance of the results, and provides suggestions for future experimentation.

### **Rigor and Trustworthiness**

#### **Quantitative Instruments Validity and Reliability**

Methods for confirming the validity and the reliability of the quantitative survey and learning assessment were described previously in the Data Collection Methods section.

## **Qualitative Rigor and Trustworthiness**

To ensure the rigor and trustworthiness of my research, several qualitative methods were employed. Through these qualitative trustworthiness and rigor processes the believability of the data was strengthened (Maxwell, 2010). Relying on only one data source provides only limited research and hinders attempts to infer from a singular data source. By using multiple methods, known as triangulation, I was able to track the similarities from the various data sources in order to strengthen my research (Morgan, 2019).

### **Triangulation**

As defined by Creswell (2013), triangulation requires using multiple data sources in a research study. In the process of methodological triangulation, as described by Gibson (2017), I used both participant interviews and participant panel discussion observations. By using both interview data and data that I recorded during observations, the research had two distinct sets of data concerning the interactions provided through Schoology in my setting. Additionally, the quantitative survey data was incorporated to provide three distinct data sources.

### **Prolonged Exposure**

As the course instructor I was highly comfortable in the setting. I was familiar with the learners enrolled in my courses. Having familiarity with the participants, combined with years of experience at the setting, resulted in easier data collection and analysis because I could use institutional tools (email, Bright Arrow, Schoology) to continuously communicate with participants and other stakeholders (Mertler, 2017). As the learners' instructor, I needed to avoid and be aware of bias caused by this familiarity and consider

bias as a factor in all data collection. After all participants had given informed consent and my usage of the subjects had been authorized by an Institutional Review Board (IRB), the research commenced.

### **Member Checks**

Member checking is asking the participants to read and review data and findings in order to provide feedback and to strengthen the trustworthiness of the findings (Chase, 2017). Throughout the data collection and analysis process, participants were offered and encouraged to review the data, the codes and themes derived from the data sources, and reviewed the research findings. This was to assure the data recorded matched the intent of the data presented. Described by Van Tuyl and Whitmire (2016), a plan involving periodic and consistent opportunities was presented to stakeholders, including participants, to increase the accuracy of the data and to enhance the level of trustworthiness of the data and findings.

### **Peer-debriefing**

An external audit of my research was performed by experts on action research through my program of study at a state university (Grant, n.d.). These professors rigorously reviewed my procedures, data collection methods, data analysis, and findings. Their acceptance of my research as trustworthy and rigorous was critical to the believability of my findings (Creswell, 2013). Additionally, as a member of a cohort with colleague reading groups, my research was reviewed and critiqued by other educators, enhancing my opportunities for revision and reflection. My research study was submitted to both the university professors and to my colleagues electronically to facilitate the review process.

### **Thick and Rich Description**

By using multiple examples and references, and including frequent clarifying detail in my study, the authenticity of my results was strengthened, and trustworthiness enhanced (Creswell, 2013; Mobley, Brawner, Lord, Main, & Camacho, 2019). The thick and rich description provided contextual information concerning the setting, participants, and data collection methods in order to clarify the research.

### **Audit Trail**

As I interpreted the collected data, I recorded my process for coding, categorizing, and theme development. This record is available for other researchers or stakeholders to follow my decision-making processes and my incorporation of data (Scharp & Sanders, 2018). An electronic journal served as the data base for my reflections, thought processes, decision making rationale, and provided detail on how I had performed my analysis. All of the preceding rigor and trustworthiness measures and their incorporation into my research were recorded in the electronic journal.

### **Plan for Sharing & Communicating**

The purpose of this research was to understand and evaluate the interactions of learners with their instructor, with their peers, and with academic content using the LMS Schoology. Specifically, learners in AP courses in a southern urban high school evaluated modules that were designed to enhance interactivity. In sharing the results of this study, an insight into the effectiveness, in terms of interactivity, of LMS-based modules is available for other teachers in similar settings to follow. As more school districts are adopting LMSs, evaluative data will be needed to inform students, teachers, parents, and administrators of the worthiness of LMS usage (Sauers & McLeod, 2018).



The results of this research were shared with five groups of stakeholders. First, at the local level with the learners enrolled in AP Human Geography (APHG). The learners had already participated in member checking and again had an opportunity to review the results for accuracy. Additionally, these students will take future AP courses in their immediate future. Any and all insight into which interactions enhance their learning should prove beneficial.

Second, parents have similar concerns as the students and are legally entitled to share in the results that will directly influence the educational futures of their children. Parents may make future educational decisions concerning LMS usage, distance learning, or hybrid scheduling based in-part on these results.

Third, the school's administrative team should closely follow and seek additional information after viewing the results. No classroom exists in a vacuum, if the innovation provided tangible results, positive or negative, these decision makers need to be informed. Future classroom instruction models as well as eLearning opportunities could be influenced by the results.

This sharing occurred through a visual aid filled PowerPoint presentation delivered at a voluntary, after school, open-forum discussion involving the participants and stakeholders. To maintain anonymity, information was coded and presented using the same pseudonyms as during the research. This meeting allowed for reflection and dialogue between the participants and stakeholders as well as the researcher. After this initial meeting I met individually with students, parents, and the administrative teams in brief breakout sessions to analyze divergences in these groups' reflections, questions, and commentary. Using the learners' input from surveys, interviews, and observations,

recommendations for an action plan was made incorporating the study's data in terms of curriculum and instruction modification that reflects the views on interaction.

In addition to an open forum, results were shared to a fourth group at a district level professional development conference. The target audience was other AP teachers and curriculum developers with the goal of using the research to open reflective dialogue within a new professional learning community.

Finally, the results will be presented, upon acceptance of the proposal, to a fifth group at an annual conference of AP teachers. This conference draws participants on a global scale. If the results are interesting and advance the discussion on interaction as provided through an LMS significantly, then publication of a paper in an educational journal or e-journal would be the culminating step in the sharing process.

## CHAPTER 4: ANALYSIS AND FINDINGS

This mixed methods action research necessitated both quantitative and qualitative measures. The quantitative measures consisted of a pre- and postintervention interactivity survey and a pretest-posttest covering a culture unit in APHG. The quantitative instruments are described followed by a description of the method of analysis, a reliability report on the internal consistency, and an explanation of the findings including the descriptive and inferential statistics. A discussion detailing the significance of the quantitative findings summarizes the research.

The qualitative measures include a participant individual interview protocol and a participant panel group discussion. First, for each datapoint the quantity of codes produced is discussed as well as the procedures used to devise and sort codes. Second, the process of coding is described including procedural examples and samples of the process. Then, the findings are presented including themes and assertions. Last, participant data, including pseudonym development, quotations from the qualitative measures, and thematic development into categories strategies, and the significance of this aggregated data are discussed.

### **Quantitative Findings**

Quantitative data are provided by two data sources: a pre- and postintervention survey and a pretest-posttest knowledge assessment. First, the pre-post intervention survey is described including its methods of analysis, reliability of the test instrument,

and the findings. Findings are categorized, and then discussed, into descriptive statistics, inferential statistics, and the significance of the data. Following the pre- and postintervention survey findings, the pretest-posttest is described and analyzed.

### **Pre- and Postintervention Survey**

The survey (see Appendices K-L) consists of four subscale sections, each with ten prompts for a total of 40 items. The four subscales are general interactivity, learner-instructor interactivity, learner-learner interactivity, and learner-content interactivity. The survey responses are ranked using a Likert-type scale ranging from 1: *Strongly disagree* to 5: *Strongly agree* with each prompt. The survey participants ( $n = 16$ ) responded to the survey at two separate times, first, prior to using the increased interactive modules and then at the culmination of the interactive modules.

To analyze the quantitative data provided by the survey subscales, the data from each survey were recorded onto a Microsoft Excel spreadsheet in order to calculate the descriptive and inferential statistics. From the aggregated data, it was possible to determine the average response on each subscale and generate statistics for analysis. The survey was examined for content validity by two teachers of APHG, both with over ten years of teaching the subject in a similar setting as mine. These experts reviewed the survey items and deemed them valid for the content of the course. The internal reliability of the survey was determined by testing the participants' postsurvey responses with software from JASP. The responses were organized into four content-specific subscales concerning interactivity. The general interactivity (Cronbach's  $\alpha = 0.98$ ), the learner-instructor (Cronbach's  $\alpha = 0.97$ ), the learner-learner (Cronbach's  $\alpha = 0.95$ ), and the

learner-content (Cronbach's  $\alpha = .094$ ) subscales of the survey, as well as the overall instrument (Cronbach's  $\alpha = 0.99$ ) were internally consistent and reliable.

**Descriptive statistics.** The descriptive statistics for the participants ( $n = 16$ ) for the survey items were derived from each of the four subscales on both the presurvey and postsurvey. The mean response of each survey subscale and its standard deviation were calculated using JASP software and are displayed in Table 4.1.

**Table 4.1** *Pre/Post Survey Descriptive Statistics*

<b>Subscale</b>	<b>Presurvey Mean (SD)</b>	<b>Postsurvey Mean (SD)</b>	<b>Mean Difference</b>
General Interactivity	3.40 (0.94)	3.50 (0.49)	+0.10
Learner-Instructor	3.50 (0.51)	3.80 (0.54)	+0.30
Learner-Learner	3.20 (0.43)	3.50 (0.50)	+0.30
Learner-Content	3.80 (1.16)	4.10 (1.16)	+0.30

Presurvey and postsurvey data indicated the mean presurvey scores for the General interactivity subscale were 3.40 with a standard deviation of 0.94 while postsurvey data indicated a means of 3.50 with a standard deviation of 0.49. The learner-instructor subscale indicated a presurvey mean of 3.50 and a standard deviation of 0.51 while postsurvey data indicated a mean of 3.80 with a standard deviation of 0.54. The learner-learner subscale indicated a presurvey mean of 3.20 and a standard deviation of 0.43 with a postsurvey mean of 3.50 and a standard deviation of 0.50. The learner-content

subscale indicated a presurvey mean of 3.80 and a standard deviation of 0.60 with a postsurvey mean of 4.10 and standard deviation of 1.16.

The means of the presurvey subscales were surpassed by the mean of the postsurvey indicating that the participants ( $n = 16$ ) increased their interactivity and reported it on the Likert-type scale. Three out of the four subscales had a positive increase of .030. The smallest area of increase from presurvey to postsurvey means was in the General Interactivity subscale. Overall, a consistent pattern of increase is seen in the means of the four subscales from presurvey to postsurvey. The standard deviations from all subscales for the presurvey and the postsurvey were highly similar.

**Inferential statistics.** A paired samples  $t$ -test was conducted to compare presurvey means to postsurvey means. To determine if the survey responses for each subscale were distributed into the range of normality, both pre- and posttest data were tested for normality using a Shapiro-Wilk test. The distribution of the pre and post survey items as indicated by the Shapiro-Wilk was normal ( $p > 0.05$ ). To determine significant variances in the presurvey and postsurvey, a paired samples  $t$ -test was run on each subscale using an alpha level of 0.0125 using a Bonferroni adjustment for the four subscales (i.e.,  $\alpha = 0.05/4 = 0.0125$ ). The (1) general interactivity subscale presurvey results ( $M = 3.40$ ,  $SD = 0.94$ ) were compared with the postsurvey results ( $M = 3.50$ ,  $SD = 0.49$ ),  $t(16) = -3.35$ ,  $p = .008$ ; a significant difference was found. (2) The learner-instructor subscale presurvey results ( $M = 3.20$ ,  $SD = 0.43$ ) were compared with the postsurvey results ( $M = 3.80$ ,  $SD = 0.54$ ),  $t(16) = -6.71$ ,  $p < .001$ ; a significant difference was found. (3) The learner-learner subscale presurvey results ( $M = 3.20$ ,  $SD = 0.43$ ) were compared with the postsurvey results ( $M = 3.50$ ,  $SD = 0.50$ ),  $t(16) = -2.10$ ,  $p = .065$ ; no significant difference was

found. (4) The learner-content subscale presurvey results ( $M = 3.80$ ,  $SD = 1.16$ ) were compared with the postsurvey results ( $M = 4.10$ ,  $SD = 1.16$ ),  $t(16) = -4.88$ ,  $p < .001$ ; a significant difference was found. Overall, significant difference was found in the general interactivity, learner-instructor, and learner-content subscales while no significant difference was found in the learner-learner subscale. This signifies that the interactivity in the teacher-created modules was interactive. These results are summarized in Table 4.2.

**Table 4.2** Paired Samples *t*-tests for Survey Subscales.

<b>Subscale</b>	<b>Presurvey <i>M</i>(<i>SD</i>)</b>	<b>Postsurvey <i>M</i>(<i>SD</i>)</b>	<b><i>t</i>(15)</b>	<b><i>p</i></b>
General	3.40 (0.94)	3.50 (0.49)	-3.35	.008
Interactivity				
Learner- Instructor	3.50 (0.51)	3.80 (0.54)	-6.71	<.001
Learner-Learner	3.20 (0.43)	3.50 (0.50)	-2.10	.065
Learner-Content	3.80 (0.60)	3.80 (0.42)	-4.88	<.001

### **Pretest/Posttest Content Knowledge Assessment**

To provide a measurable APHG content knowledge assessment, I created a test using validated items from the College Board’s teacher resource site AP Classrooms (the College Board, 2021), which has been verified through repeated development and testing procedures. The test consisted of 50 multiple-choice style questions each with five possible provided responses labeled “A” to “E.” The test was administered as a pretest the day before modular instruction commenced and as a posttest the day after the

innovation had taken place. The test was examined by the same two teachers of APHG. These experts reviewed the test items and deemed them valid for the content of the course. Additionally, the test was derived from released APHG exams offered for classroom usage by the College Board (the College Board, 2021). These released questions have been rigorously developed, tested for clarity, equity, and fairness, and have been utilized on previously administered APHG exams (the College Board, 2021). The reliability of the test was determined by testing the participants' responses with statistical calculations entered into a Microsoft Excel spreadsheet. The overall test items were determined to be internally consistent and reliable ( $KR-20 = 0.90$ ). The 50 items on the content knowledge assessment were divided into categories based upon three subtopics: diffusion (Items 1-15), origins (Items 16-30), and distribution (Items 31-50). Also, three subscales were determined to have adequate internally consistency and, therefore, the results should be taken as meaningful: Diffusion ( $KR-20 = 0.91$ ), Origin ( $KR-20 = 0.93$ ), and Distribution ( $KR-20 = 0.90$ ). The value for  $KR-20$  ranges from 0 to 1, with higher values indicating higher reliability (Streiner, 2003).

**Descriptive statistics.** The descriptive statistics for the content knowledge assessment ( $n = 16$ ) were calculated using JASP and displayed in Table 4.3. The mean for the posttest ( $M = 45.81$ ,  $SD = 8.60$ ) was higher than the mean of the pretest ( $M = 28.56$ ,  $SD = 4.56$ ). Also, the standard deviation on the posttest was higher than pretest.

**Table 4.3** *Pre/Posttest Results for Content Knowledge Assessment*

<b>Content Knowledge Assessment</b>	<b><i>M</i></b>	<b><i>SD</i></b>
Overall Pretest	28.56	3.22
Overall Posttest	45.81	4.56



The three categories were treated as subscales and descriptive statistics for pretest and posttest were calculated for the three subtopics. The means of the pretest subscales were all nearly the same at 29 while the posttest mean for all three subscales rose to 44 or higher. The Origins subscale had the smallest margin of growth, an increase of just over 14 points while the other two subscales increased by 16 and 17 points, respectively. Overall, a consistent pattern of increase is seen in the means of the three subscales from pretest to posttest as well as a decline in the standard deviation from all three subscales from pretest to posttest. These data are presented in Table 4.4.

**Table 4.4** *Posttest Results*

<b>Subtopic &amp; Items</b>	<b><i>Pretest M (SD)</i></b>	<b><i>Posttest M (SD)</i></b>
Diffusion (Items 1-15)	29.49 (15.81)	46.23 (5.17)
Origins (Items 16-30)	29.78 (14.72)	44.23 (6.48)
Distribution (Items 31-50)	29.50 (12.90)	47.17 (3.63)

**Inferential statistics.** A paired samples *t*-test was conducted to compare the overall pretest and posttest means along with three additional *t*-tests to compare the subtopic pretest and posttest means. Because four tests were being conducted on the same data, a Bonferroni adjustment was made to the significance level setting it to  $\alpha = .0125$  (i.e.,  $\alpha = .05/4 = .0125$ ).

For the overall scores, a Shapiro-Wilk test confirmed normality of data ( $p = .538$ ). The participants' scores on the content knowledge assessment significantly improved from the pretest ( $M = 28.56, SD = 3.22$ ) to the posttest ( $M = 46.06, SD = 4.34$ ),  $t(15) = -$

10.65,  $p < .001$ . Therefore, instruction was effective and student learning increased (see Table 4.5).

**Table 4.5** Paired Samples *T*-tests for Pretest and Posttest of Overall and Subtopic Scores.

Test	Pretest <i>M</i> ( <i>SD</i> )	Posttest <i>M</i> ( <i>SD</i> )	<i>t</i> (15)	<i>p</i>
Overall	28.56 (3.22)	46.06 (4.34)	-10.65	<.001
Diffusion	29.49 (15.81)	46.23 (5.17)	-5.39	<.001
Origins	29.78 (14.72)	44.23 (6.48)	-3.81	.002
Distribution	29.50 (12.90)	47.17 (3.63)	-6.93	<.001

For the Diffusion subtopic scores, a Shapiro-Wilk test confirmed normality of data ( $p = .706$ ). The participants' scores on the Diffusion subtopic section of the content knowledge assessment significantly improved from the pretest ( $M = 29.49$ ,  $SD = 15.81$ ) to the posttest ( $M = 46.23$ ,  $SD = 5.17$ ),  $t(15) = -5.39$ ,  $p < .001$ . This indicates that the instruction on this section was effective to significantly improve student learning (see Table 4.5).

For the Origins subtopic scores, a Shapiro-Wilk test confirmed normality of data ( $p = .327$ ). The participants' scores on the Origins subtopic section of the content knowledge assessment significantly improved from the pretest ( $M = 29.78$ ,  $SD = 14.72$ ) to the posttest ( $M = 44.23$ ,  $SD = 6.48$ ),  $t(15) = -3.81$ ,  $p = .002$ , signifying that instruction on this section was effective and significantly improved student learning (see Table 4.5).

For the Distribution subtopic scores, a Shapiro-Wilk test confirmed normality of data ( $p = .544$ ). The participants' scores on the Distribution subtopic section of the content knowledge assessment significantly improved from the pretest ( $M = 29.50$ ,  $SD =$

12.90) to the posttest ( $M = 47.17$ ,  $SD = 3.63$ ),  $t(20) = -6.93$ ,  $p = <.001$ . Instruction on this section was effective to significantly improve student learning (see Table 4.5 above for reference).

### **Qualitative Analysis**

This section identifies the data sources used during qualitative research, explains the processes utilized to analyze the data gained from these sources, identifies, explains, and exemplifies the coding, categorization, and theming construction methodology utilized, and offers an analysis and explanation as to how the thematic data signified results. This mixed methods study collected qualitative data in order to elucidate the levels of interactivity reported by the participants in each of the cultural unit modules.

#### **Description of Qualitative Data**

The study collected materials from two different data sources: First, a semi-structured one-to-one interview (see Appendix G) was conducted with five voluntary participants, and second, a panel group discussion (see Appendix I) was conducted with the same five participants. Table 4.6 highlights the qualitative data sources and the number of extracted codes from each source.

**Table 4.6** *First-cycle Coding Qualitative Data Sources*

<b>Source</b>	<b>In Vivo Codes</b>	<b>Descriptive Codes</b>	<b>Total Number of Codes Applied</b>
Interview 1	20	29	49
Interview 2	10	10	20
Interview 3	9	14	23
Interview 4	17	30	47

<b>Source</b>	<b>In Vivo Codes</b>	<b>Descriptive Codes</b>	<b>Total Number of Codes Applied</b>
Interview 5	10	15	25
Panel Discussion	70	90	160
Total	136	185	321

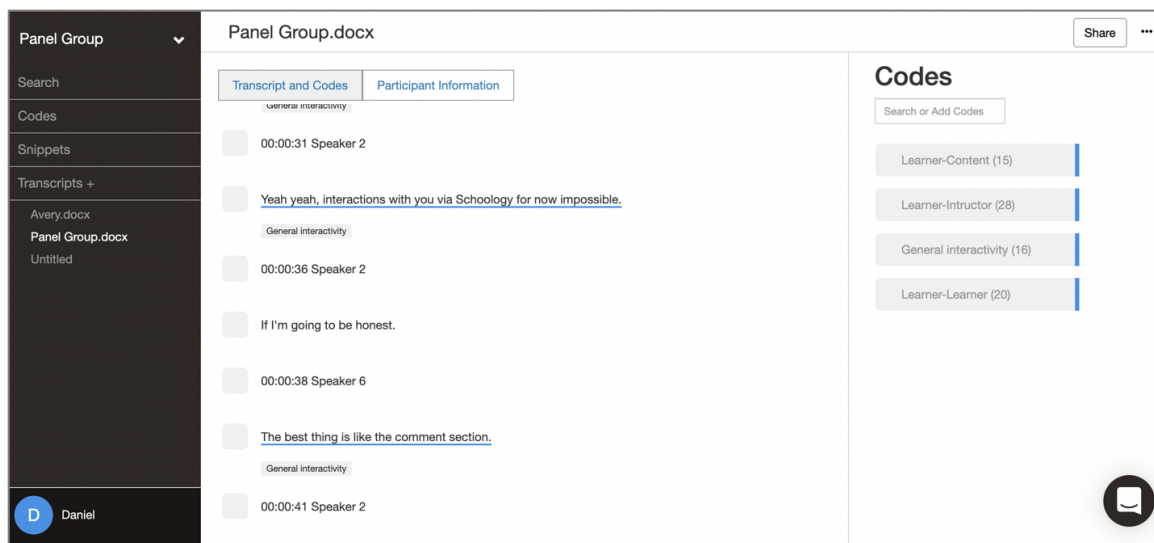
The interviews yielded a total of 161 code uses. The interview with participant 1 yielded the most coded information while the interview with participants 2 and 5 yielded the least coded results. The panel discussion yielded 160 code usages.

The interviews were recorded and transcribed verbatim using a Microsoft 365 Word application. The interviews were annotated to include nonverbal reactions to prompts and nonverbal emotive responses during the interview dialogue. For example, during Interview 1 the participant responded to the prompt: *“How would you rate the effectiveness of your communications and interactions with the instructor?”* the participant verbally replied, “Tough one...I felt like, and while you were definitely easily accessible, I felt like there could have been things done to make it feel more so, and just make the process a bit more streamlined.” Included in the transcripts alongside the verbatim commentary I inserted that this participant “...made a wry face” and “grimaced” during the response connoting a negative reply to the prompt. Both the verbal response and the nonverbal response were used to generate codes signifying a lack of interactivity between learner and instructor during the module.

## Qualitative Data Analysis Process

The analysis process began with the transcription of the interviews and the panel discussion. The interviews were transcribed by using the Microsoft 365 Word program. The program produces an editable transcript with time stamps. The editing feature was critical to adding interpretations of the nonverbal emotive responses included in the discussion but not transcribed by the software. Both the audio file, produced by Microsoft 365 Word, and the interviewer's annotated interview protocol were used to complete each transcript. Transcription and annotation, which was singularly performed by me, occurred in January of 2022 which was approximately one month following the intervention and the interviews.

To analyze the annotated transcripts, a sentence was used as the unit of analysis. This unit is appropriate due to the often short and verbally limited responses given by the participants during both the interviews and the panel group discussion. Transcripts were uploaded to the web-based qualitative analysis site Delve for ease of analysis (see Figure 4.1).



**Figure 4.1** *Qualitative Analysis Tool Delve Example Screenshot*

First cycle coding incorporated in vivo coding and descriptive coding. In vivo coding was utilized for several reasons. First, the verbatim quotations of the participants was used in the inductive coding method that I used to create categories and themes (Saldaña, 2016). Second, the process was emic (Saldaña, 2016) as I was trying to gauge the attitudes and perspectives of these specific participants in an APHG course. The action research module is designed to discover such data about a particular group of participants, in this instance APHG students who are studying a culture unit in my course, at a level that can lead to actionable results, which in vivo coding provides by analyzing the particular words and phraseology of this population (Creswell, 2013). The in vivo coding process began with a close reading of the transcribed interviews accompanied by an audio recording of each interview and the panel group discussion. Words or phrases that connoted an attitude, feeling, or perception of the interactivity of the modules were highlighted and coded verbatim. For example, during the panel group discussion, I solicited a response from the group to the prompt “Share how you guys (*sic*) felt about the interactions with me during the modules” and Interviewee 2 responded, “Yeah, interactions with you via Schoology for now, if I’m going to be honest, impossible.” This sentence was analyzed and the word “impossible” was in vivo coded to represent the strong reaction to the prompt. The code generated represents a high degree of negative perception of the learner-instructor interactivity in the modules.

Descriptive coding is also appropriate due to the nature of this action research. As a first-time qualitative researcher descriptive coding is recommended to gather useful information centered on my research questions (Saldaña, 2016). The perceptions of APHG students concerning their interactions in the culture unit span a myriad of

possibilities. By utilizing descriptive coding, I gathered information from the multiple data sources, the five interviews and the panel discussion, and coded the information by topic. For example, in Interview 1 asked the participant, “Overall, how would you describe the modules in their ease of use? Were they easy, hard, about normal?” To which the participant responded:

I'd say they were somewhere between easy and about normal. I know that's not very specific, but there are some parts of being isolated that made some of that, that was a bit harder because, I mean say when you're talking, you always give up some extra anecdotes or examples that deepen the understanding. Gives me something to compare it to which makes it easier to understand the reading.

This quote was broken down into three sentences and analyzed in order to code the response into usable data. In the first sentence, a code was created reflecting the respondent’s positive response to the question. The words “somewhere between easy and about normal” specifically were used to create this code. The second sentence was analyzed and used to create a different code reflecting frustration with a perceived lack of learner-instructor interactivity. The words “a bit harder” were used to create this code. The third sentence was coded as a concrete example of a perceived lack of learner-instructor interaction. The words “makes it easier” were used to create this code.

I continued to read through the transcripts in order to apply both in vivo and descriptive codes. These codes attempted to encompass the students’ verbatim words and the perceptions held by these participants concerning the varied forms of interactivity. Descriptive coding allowed me to identify possible reasons for the perceptions held by the students whether positive, neutral, or negative (Saldaña, 2016). This process yielded

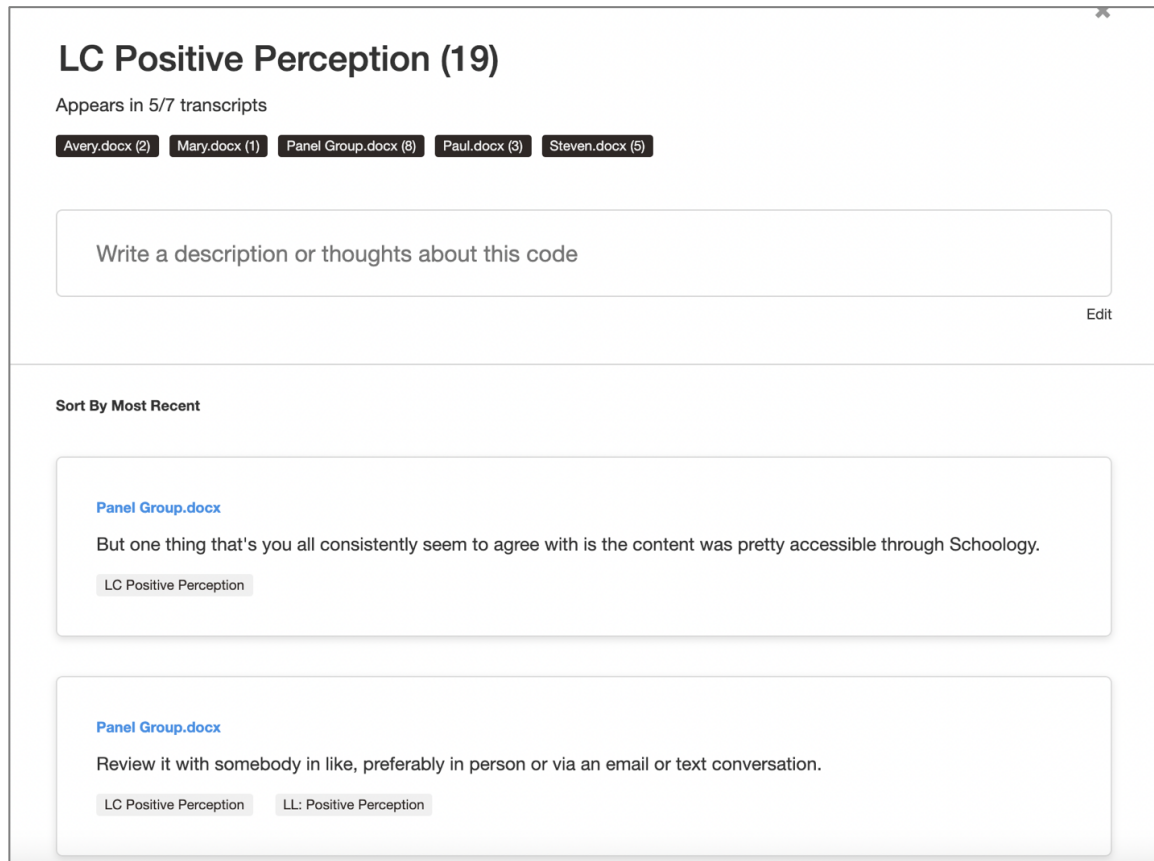
first-cycle codes such as “positive learner-instructor experience” or “negative learner-learner perception” which altogether totaled 321 coded responses. Through repeated purposeful readings of the transcripts, sixteen first-cycle codes were identified and are presented in Table 4.7.

**Table 4.7** *First-cycle Codes*

<b>Code</b>	<b>Number of Times Codes Applied</b>
Learner-Instructor: Positive Perception	15
Learner-Instructor: Negative Perception	19
Learner-Instructor: Positive Experience	19
Learner-Instructor: Negative Experience	20
Learner-Learner: Positive Perception	28
Learner-Learner: Negative Perception	15
Learner-Learner: Positive Experience	19
Learner-Learner: Negative Experience	31
Learner-Content: Positive Perception	20
Learner-Content: Negative Perception	9
Learner-Content: Positive Experience	29
Learner-Content: Negative Experience	13
Schoolology-usage: Positive Perception	27
Schoolology-usage: Negative Perception	14
Schoolology-usage: Positive Experience	20
Schoolology-usage: Negative Experience	23

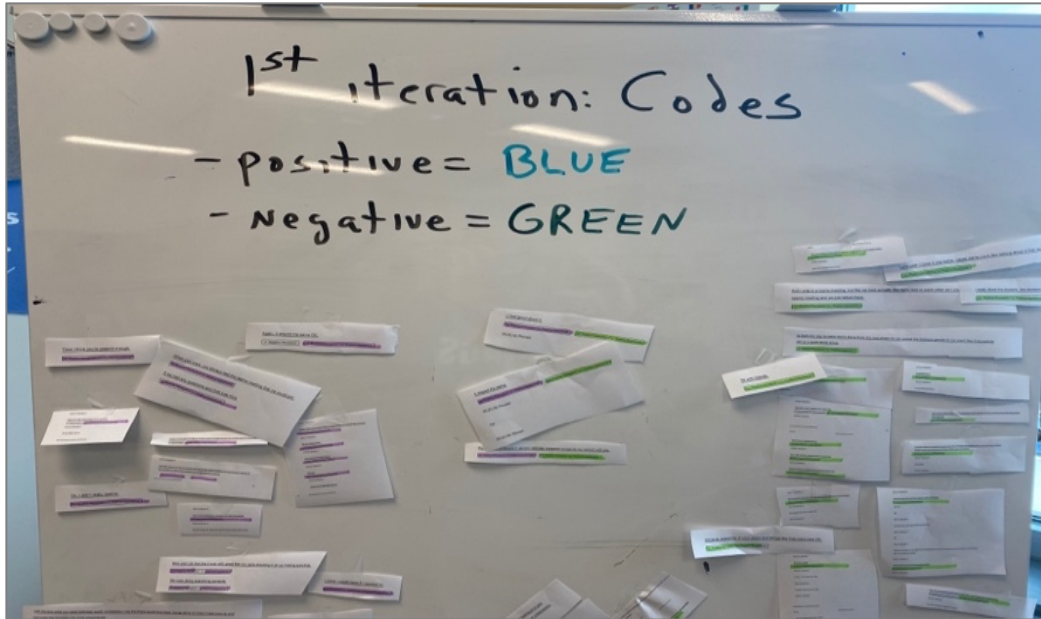


The usage of these codes was reviewed and revised if needed by examining the code application window offered via Delve (see figure 4.2).



**Figure 4.2** *Sample Review of First-Cycle Code Through Delve*

After verifying that all codes had been applied appropriately these codes were printed from the Delve website and cut apart and sorted into broad groupings. The code groupings were arranged on a drafting board (see figure 4.3) in a process describe by Saldaña (2016) as code mapping.



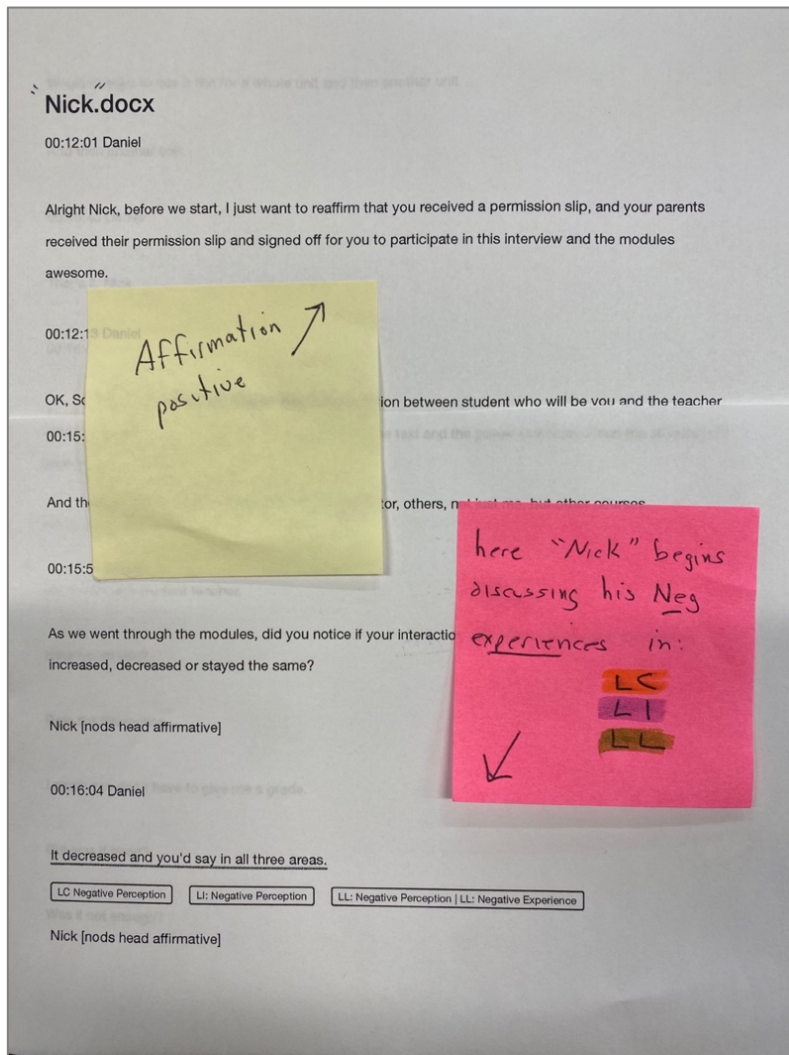
**Figure 4.3** *Sample of First-Cycle Code Mapping*

On the drafting board, the individual codes were categorized based upon whether they were in vivo or descriptive codes. This created two areas on the drafting table. In each of these areas the individual codes were then resorted to reflect content categories. This allowed for a transition from first cycle to second-cycle coding.

Annotations concerning the rationale for each code used, the reasoning behind using in vivo and descriptive coding, and anticipated categories derived from the first cycle of coding were all placed into my researcher's journal for future reflection and reference as needed.

The transition to a second cycle of coding was made through an eclectic analysis. Eclectic analysis is recommended for beginning researchers by Saldaña (2016). This study combines coded transcripts from both individual and a group interview and eclectic coding is appropriate in such instances (Saldaña, 2016). From the in vivo codes I created a digital outline and also arranged the cut-out in vivo codes from the drafting table based upon their content. Analyzing the content allowed these first cycle codes to be outlined,

or categorized, by the implications directly stated or implied through emotional nonverbal communication. The implications suggested perceptions of each interviewee concerning the Schoology modules. Student perceptions were categorized into three general areas: (1) the Schoology modules improved performance, (2) the Schoology modules hindered my performance, (3) or the Schoology modules had some positive and some negative aspects. Analytical memos were used to record my rationale for categorizing each code as I did. The memos were recorded in my researcher's journal as well as attached to my coding outline via a "sticky" note (see Figure 4.4).



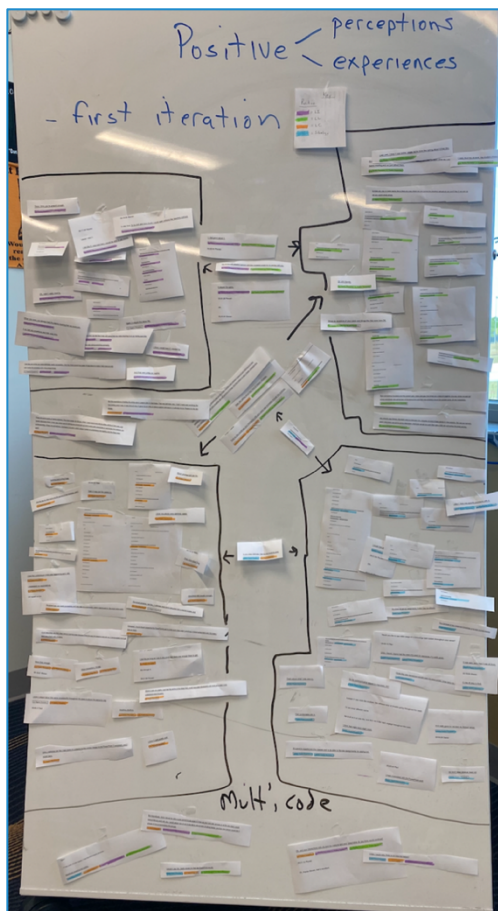
**Figure 4.4** Sample Analytical Memo

This process was replicated with the descriptive codes. As these codes required more analysis into the meaning of an interviewee’s response the transcripts were reread along with a reviewing of the recorded interviews in order to gain insight into the perceptions of the students through both their verbal and nonverbal reactions. This served as a final review of the descriptive codes and clarified any potential misinterpretations of the data. A data a codes summary table was completed as a part of this review process (see Table 4.8).

**Table 4.8** *First-cycle Coding Review*

<b>Source</b>	<b>Analytical Memo Summary</b>	<b>Most Frequent Code</b>
Interview 1	Positive interactions with peers and a generally positive perception of the modules.	Positive learner-learner perception
Interview 2	Had the best experiences independent of instructor or peers.	Positive learner-content experience
Interview 3	Student strongly disliked the modules especially the learner-content aspects.	Negative learner-content perception
Interview 4	Generally ambivalent, however had several negative experiences with learner-learner interaction which affected the experience.	Negative learner-learner experience
Interview 5	Student performed well on assessment which may have skewed initial perceptions, such as the negative experiences with the learner-instructor interaction.	Positive learner-instructor experience

Following this analysis, pattern coding was used for second cycle coding. The first cycle codes are categorized into a broader and more thematic data in this process (Saldaña, 2016). My first cycle in vivo and descriptive codes were recoded into pattern codes based on emergent themes detected through this analysis, for example the descriptive codes “negative learner-content perception”, “negative-learner-content experience”, and the in vivo codes “hard to understand the content”, and “better if in-person” to create the second cycle pattern code “learner-content module problems.” This process of identifying commonalities from the first cycle codes, 321 codes in total, and recoding them according to content and in vivo pattern continued until six pattern codes emerged (see Figure 4.5 and Table 4.9).



**Figure 4.5** *Codes to Categories*

**Table 4.9** *Second-cycle Coding Qualitative Data Sources*

<b>Second-cycle Pattern Code</b>	<b>In Vivo Codes</b>	<b>Descriptive Codes</b>
Learner-learner module problems	6	43
Learner-learner module benefits	5	15
Learner-content module problems	11	12
Learner-content module benefits	7	40
Learner-instructor module problems	3	22
Learner-instructor module benefits	20	140

After incorporating my process and summarizing my reasonings in my researcher’s journal, and after a diligent reflection of my multiple first and second cycle coding methods, and after a peer analysis of my research completed by several members of my doctoral program of study reading group, and finally after a review and discussion with my academic advisor and faculty dissertation advisor, I had identified the major themes of my qualitative analysis.

Prior to advancing with the analysis of my research, I utilized several of the post-coding transition strategies recommended by Saldaña (2106) as a measure to verify the themes garnished from my research. For example, the “top ten list” strategy was utilized when analyzing in vivo first cycle codes (see figure 4.5). The top ten in vivo quotes, according to my subjective significance, were pulled, enlarged, and arranged according to the insights provided toward the modules. Additionally, the “touch test” was applied to the codes in order to develop a higher level of abstractedness and generate themes (Saldaña, 2016). An example of this process occurred with the first cycle in vivo codes

“I’d feel comfortable” and “I liked the interface” which alluded to *positive* perceptions of the learner-content module. This attribution of an abstract perception to concrete quotations helped to broaden the scale of my themes and to develop themes that were accurately reflective of the students’ experiences. By utilizing these funneling devices two major themes developed: positive interactivity and negative interactivity (see Table 4.10).

**Table 4.10** *Theme Development*

<b>Theme</b>	<b>Second-cycle Pattern Code</b>
Negative interactivity is when distraction or lack of access prevents learning.	Learner-learner module problems Learner-content module problems Learner-instructor module problems
Positive interactivity is when transactional distance does not hinder meaningful learning.	Learner-learner module benefits Learner-content module benefits Learner-instructor benefits

Due to the nature of this action research, data that was ambivalent or ambiguous was either discarded as irrelevant or was incorporated as a negative. If my action or innovation produced no measurable perceptions, then that action or innovation failed to stimulate a response and thus is negatively perceived.

## Participant Descriptions

Due to the small size of the panel group ( $n = 5$ ) and the fact that five interviews were analyzed a description of these contributors to my research is warranted. The five interviewees were voluntary and randomly selected from the total number of students enrolled in APHG. Table 4.11 offers a brief description of each anonymized participant.

**Table 4.11** *Qualitative Participant Descriptions*

<b>Anonymized Participant</b>	<b>Biographical Synopsis</b>
Rick	Rick is the youngest student in the class. Rick is generally quiet but will participate in discussions when prompted. Rick has an “A” average in the course.
Sara	Sara was the only female to participate in the panel group discussion. She has an “A” average although self-describes as an “underachiever.” Sara participates frequently in class.
Saul	Saul is the sibling of two other students who have successfully taken this course thus he has a clearer picture of the course objectives. Saul has an “A” average. Saul takes extra time with his readings to pick up on nuances and in order to generate frequent in-class commentary.
Steve	Steve self-describes as a “bit of a goofball.” Steve has more of a jovial sense of humor and is not regularly disruptive. Steve has a “B” average although he has set a goal of earning an “A.” Steve is a frequent commentator in class.
Aaron	Aaron is also the younger sibling of a former student. Aaron has been identified with a mild form of Autism, however, receives no accommodations. Aaron is a daily contributor to class discussions and is generally correct when volunteering an answer to a class prompt. Aaron describes himself as a perfectionist. Aaron has an “A” average.

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All five participants were enrolled in APHG at Springdale High School in Springdale, A southeastern U.S. city, all were in the ninth grade, and all were identified



as gifted and talented by the school district. All enrolled in this AP course voluntarily and all expected to earn college credit through the successful completion of the APHG Exam. Demographics of the five participants are summarized in Table 4.12.

**Table 4.12** *Participant Demographics*

<b>Anonymized participant</b>	<b>Gender</b>	<b>Age</b>	<b>Grade</b>	<b>Gifted/Talented</b>
Rick	M	14	9	Yes
Sara	F	15	9	Yes
Saul	M	15	9	Yes
Steve	M	15	9	Yes
Aaron	M	15	9	Yes

Rick was one of the younger students in the class. Rick had an older brother take and pass APHG; therefore, he may have felt some comparison anxiety. Rick was classified as gifted and talented and takes his academics seriously. Rick expressed a generally unfavorable outlook towards the modules as he prefers traditional instruction.

Sara was the only female interviewed and in the panel group. Generally, the enrollment in APHG internationally is split nearly 50/50 between genders (The College Board, 2021). Sara was expressive, but only answered when she was certain of her accuracy. Sara had a good sense of humor, enjoyed school, and had an indifferent or ambivalent view of the modules.

Saul was the brother of two siblings who have earned distinction in previous years on the APHG exam and thus had elevated expectations. Despite this, Saul was frequently

participatory, upbeat, and a class leader. Saul had a positive view of the module experience.

Aaron, yet another legacy APHG student, was the brother of a former student who did not enjoy APHG. Aaron, however, was interested in the social sciences and had been an ardent student in terms of content attainment. Aaron enjoyed the independence of the modules significantly.

Steve was the lowest-performing student in the research. Steve was typically a “B” student, whereas the others are “A” students. Steve enjoyed geography but had been involved with disciplinary issues this semester due largely to a sense of immaturity. Steve enjoyed the modules the most and saw the most significant improvement in his post-module measures.

### **Thematic Analysis**

Both themes identified during qualitative research analysis will be defined in the following section, including how the themes explain the experiences reported by the participants in the interviews and panel group discussion. An explanation as to how each theme relates to previous literature and the overall significance of this research to the body of evidence surrounding the utility of a learning management system (LMS) to facilitate interactive and meaningful lessons.

**Theme 1: Positive interactivity is when transactional distance does not hinder meaningful learning.**

Theme 1 is defined as a generally favorable view of the interactivity between learner-learner, learner-instructor, and learner-content while completing the culture unit of APHG posted to the LMS Schoology. Theme 1 is comprised of several categories of

related data. Theme 1 subsumes the positive perceptions that students reported in the interviews and the panel group discussion. These perceptions are combined with the shared positive experiences of these students as they navigated through the culture unit by using the modules posted on Schoology. The findings of this theme demonstrate that the modules did provide adequate interactivity to the students in all the areas of interaction.

The theme was developed from data gathered from interviews with five participants and from a panel group discussion of those same five participants. Students explained in this data that positive interactivity meant that the modules provided enough interaction to provide a ZPD and meaningful learning experiences.

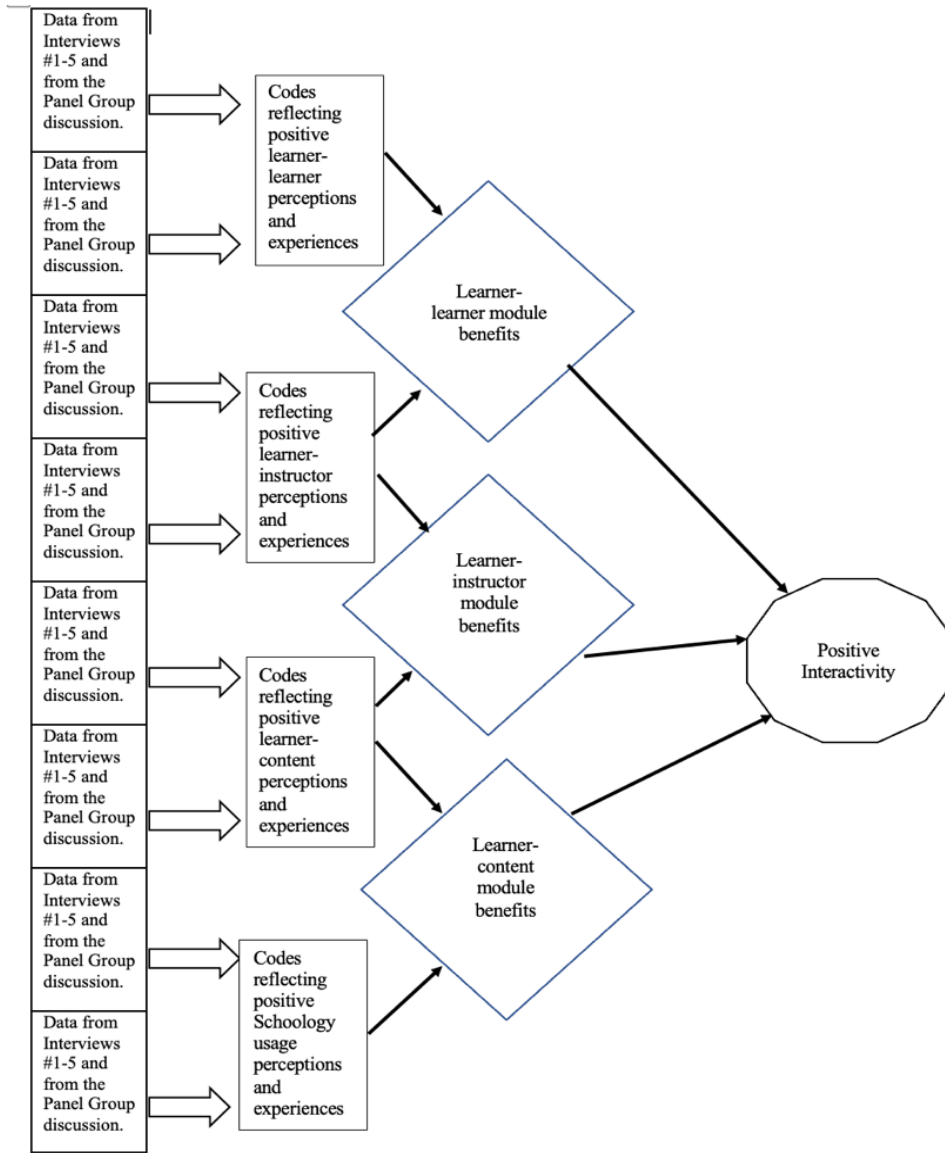
This theme reflects the extant literature concerning the ability of modules such as those used in this research to create a ZPD and provide meaningful learning opportunities. Vygotsky (1979) stated that a student can learn independently if proper supportive interactions are provided. Steve reflected that his experiences did provide learning, "I'd like to see more of the module concept. If done well, if done right, the module concept has something for everybody." Steve's positive experiences and those of the other participants used to create this theme reflect for them an extant ZPD.

Additionally, the IET of Miyazoe and Anderson (2010) states that interactivity in any of the three researched areas, provided through the modules, will be sufficient to provide a ZPD and an opportunity for significant learning. Also, the systems approach was used as one of the criteria for interactivity. This approach, developed in the 1970s by Wedemeyer (1981) and developed further in the 1980s by Moore (1983), measures interactivity as the psychological and social space between learners and instructors, other

learners, and content. The systems approach and its criteria were used to measure the interactions between the instructor-learner, learner-learner, and learner-content as provided by the instructor, through an LMS, such as Schoology, in order to determine the effectiveness of those interactions. This theme was developed from the data that was analyzed, coded, and ultimately developed into three categories of similar responses. Categories developed along the three types of interactivities researched: learner-learner, learner-instructor, and learner-content.

A final criterion for interactivity was the interactive equivalence theorem (IET) developed by Anderson (2003). The IET asserts that meaningful learning can occur in one type of interaction when interaction, either learner-content, learner-learner, or learner-instructor, is deep and purposeful. Learning can occur in one type of interaction even as the other types of interaction are diminished (Miyazoe & Anderson, 2010). This theme reflects interactivity present in at least one but maybe all three areas which satisfy the criteria of the IET for meaningful learning to occur.

Coded transcript data were separated to create each category based upon the type of interaction, the students' evaluation of that interaction (if generally positive), and whether that evaluation was based off students' perceptions or actual experience. Each of the following three categories contributed to the overarching theme of positive interactivity (see Figure 4.6) and will be discussed in order.



**Figure 4.6** Example of a Data to Theme Chart (adapted from Saldaña, 2016, p. 14).

**Category: positive learner-learner interaction.** Coded data categorized as positive learner-learner interaction if they reflected an experience or a perception where a participant learner felt that an aspect of the modules provided an opportunity for peer-interaction beneficial to their learning. Positive learner-learner interaction then can be defined as any interaction that a learner had with another while progressing through the modules that created or enhanced a learning opportunity. All participants reported that

positive learner-learner interactions meant that they felt as if the interactions supported and promoted through the modules were sufficient. For example, Sara (pseudonym) reported that: “Yeah...talking about that (course content) with other people really helped me grasp it (the content).” “Grasping the content” was interpreted as meaningful learning. During the panel group discussion, several participants highlighted the specific aspects of the modules that increased their learning through increased interactions with peers.

Saul:           When finished with the work, I liked to review it with somebody, like preferably in person or via email or text.

Sara:           Yeah, get a second opinion, not just on the comprehension of the material, but what it (content) means and see what other people think.

Rick:           I study better if people are also studying around.

Steve:          Yes, that helped me remember better.

Sara:           It definitely helped me understand several parts, there were definitely some parts of the lesson where I felt like I would have understood it wrong if I didn’t have peer interactions.

This discussion emphasizes the point that these students were able to “remember”, “comprehend”, and “understand.” These words are all synonymous with effective learning and demonstrate that these participants perceived and had experiences with their peers that was deemed as effective.

Peer-collaboration was an integral part of each module, and the data collected in this category reflected either a positive perception or a positive experience with this collaboration. Successful peer collaboration can be identified as learner-learner

interaction and thus the data in used in creating this category meets the criteria of a ZPD, IET, and systems approach (SA) (Miyazoe & Anderson, 2010; Moore, 1983; Vygotsky, 1979; Wedemeyer, 1981). The experiences and perceptions were utilized as codes and were analyzed and categorized as positive learner-learner interaction.

*Category: positive learner-instructor interaction.* Coded data categorized as positive learner-instructor if they reflected an experience or a perception where a participant learner felt that an aspect of the modules provided an opportunity for interaction with the instructor (me) beneficial to their learning. Positive learner-instructor interaction then can be defined as any interaction that a learner had with the instructor while progressing through the modules that created or enhanced a learning opportunity. All the participants reported that positive learner-instructor interactions meant that they felt as if the interactions supported and promoted through the modules was sufficient. For example, Steve (anonymized) when asked about his comfortability with the level of learner-instructor interaction reported that “I felt that if I was (*sic*) lost then I would be able to get found.” This statement alongside positive body language and facial expression helped me to categorize this response as a positive learner-instructor interaction. Another example was when Saul summarized his interactions with me thusly: “it was nice because if you (a student) had any questions then you had the option of talking to you (the instructor) and we weren’t forced to sit there and listen to other people’s questions.” Last, Aaron stated that “my contact with people definitely increased including my contact with you.” These quotes collectively represent positive experiences and positive perceptions that the participants had which they interpreted as meaningful learning experiences.

Indirect instruction as well as supportive feedback from the instructor were an integral part of each module, and the data collected in this category reflected either a positive perception or a positive experience with this interaction. These data collected in this category reflect effective learner-learner interaction as measured by creating a ZPD, and the IET and systems approach (Miyazoe & Anderson, 2010; Moore, 1983; Vygotsky, 1979; Wedemeyer, 1981). The experiences and perceptions were utilized as codes and were analyzed and categorized as positive learner-instructor interaction.

***Category: positive learner-content interaction.*** Coded data categorized as positive learner-content if they reflected an experience or a perception where a participant learner felt that an aspect of the modules provided an opportunity for a meaningful analysis, synthesis, and learning of content material beneficial to their over learning. Positive learner-content then can be defined as any interaction that a learner had with the text material, ancillary material such as articles, videos, podcasts, maps, datasets, etc. while progressing through the modules that created or enhanced a learning opportunity. The participants reported that positive learner-content interactions meant that they felt as if the interactions supported and promoted through the modules was sufficient. For example, Steve replied, “It (learner-content interaction) surpassed my expectations, especially the accessibility.” Aaron was more explicit: “The experience of finding the entire day’s lesson plan in that folder, that was definitely new. I hadn’t really seen anything like that before, and it was nice. It gave me an idea of what to expect and it allowed me to prepare for the task ahead.” This quote is an example of how participants were able to successfully use the modules to gain effective interaction with the content and again satisfying the requirements of the IET and SA and creating a ZPD (Miyazoe &



Anderson, 2010; Moore, 1983; Vygotsky, 1979; Wedemeyer, 1981). Content analysis and synthesis was an integral part of each module, and the data collected in this category reflected either a positive perception or a positive experience with this interaction. The experiences and perceptions were utilized as codes and were analyzed and categorized as positive learner-content interaction.

This category contains data which reflect that the modules did help students create a ZPD. Aaron said that “each step of the process (modules) has a different situation that you go through to help reinforce it (content) and like I did better on this assessment.” Steve said, “it was easy, you know it (content) was all there (Schoology).” These and similar data points reflect that there were sufficient interactions provided to create a ZPD (Vygotsky, 1979).

**Theme 2: Negative interactivity is when distraction or lack of access prevents learning.**

Theme 2 is defined as a generally unfavorable view of the interactivity between learner-learner, learner-instructor, and learner-content while completing the culture unit of APHG posted to the LMS Schoology. More specifically, the interactions provided through the Schoology-based modules were seen as insufficient or inadequate in providing meaningful learning opportunities for the participants and did not create a ZPD for the participants either. Theme 2 is comprised of several categories of related data which subsumes the negative perceptions and experiences that students reported in the interviews and the panel group discussion. An example of negative data that was coded and subsumed into theme 2 was when Sara said, “it might be good if we had like roles or something, this (modules) made it harder to understand the content.” This and other

similar data were organized exactly as the positive data was and then categorized into more refined groupings. Overall, the data accumulated into this theme demonstrate that the modules did not effectively provide adequate interactivity to the students in all of the areas of interaction.

Effectiveness is measured as the ability of the interactions to affect the learners' ZPD. The distance between the learner and these interactions, known as transactional distance, is measured through the level of independence learners have in their setting, and by what system is utilized in order to bridge that distance (Moore, 1983). The data in this theme supports the notion that the transactional distance was too significant for students to adequately learn.

Data that was used to create this theme suggest that meaningful interactivity was not achieved in any of the three types of interaction, thus not fulfilling the criteria of the IET or the systems approach (Miyazoe & Anderson, 2010; Moore, 1983; Wedemeyer, 1981). The data accumulated under theme 2 suggests that significant barriers to interactivity must be overcome before the modules are seen as effective for some students.

Categories developed again along the three types of interactivities researched: learner-learner, learner-instructor, and learner-content. Coded transcript data were separated to create each category based upon the type of interaction, the students' evaluation of that interaction (if generally negative), and whether that evaluation was based off students' perceptions or actual experience. Each of the following three categories contributed to the overarching theme of negative or inadequate interactivity and will be discussed in order.

*Category: negative learner-learner interaction.* Coded data categorized as negative learner-learner if it reflected an experience or a perception where a participant learner felt that an aspect of the modules did not provide an adequate opportunity for peer-interaction beneficial to their learning to occur. Negative learner-learner then can be defined as any interaction that a learner had with another while progressing through the modules that failed to provide a learning opportunity. Peer-collaboration was an integral part of each module, and the data collected in this category reflected either a negative perception or a negative experience with this collaboration. The experiences and perceptions were utilized as codes and were analyzed and categorized as negative learner-learner interaction. An example of data that supported a negative experience of the learner-learner interaction occurred during the panel group discussion:

Saul: It's not like a nice polite atmosphere like the classroom.

Sara: Yes, a lot of peer-pressure.

Aaron: Right, it made it really hard to talk true.

Saul: We're used to only talking to teachers, so there were a lot of clashing personalities.

Sara: (nods head in affirmation)

Aaron: It (clashing personalities) made it really hard to talk.

Saul: Yep, I got nothing out of a lot of that.

These data alongside similar participant responses were used to create the negative learner-learner category. Additionally, this conversation alongside other data gleaned from the interviews demonstrated that the effective learning did not happen and that the

criteria for the IET and SA went unfulfilled and no ZPD was present (Miyazoe & Anderson, 2010; Moore, 1983; Vygotsky, 1979; Wedemeyer, 1981).

**Category: *negative learner-instructor interaction.*** Coded data were categorized as negative learner-instructor if they reflected an experience or a perception where a participant reported that the modules did not provide an adequate opportunity for learner-instructor interaction which may have beneficial to their learning to occur. Negative learner-instructor interaction as a category subsumed all data that indicated that the interactions built into the module where the instructor attempted to create a ZPD failed. Examples of data used to create this category includes a quote from Rick stated, “when I come up with questions in class I can usually turn around and ask, now I felt as if I would have to wait until tomorrow or the next day to see you.” Additionally, Aaron reported that “I feel like there were things that could have been done to make it (the modules) feel like more accessible to you or a way to make the process more streamlined” which was coded and categorized as a negative experience. Panel discussion data also indicated negative perceptions and experiences.

Rick: I had a lot of problems with that (learner-instructor interaction).  
Whether it is creating roles for us, or being more accessible, or having a way where you (me) could interfere and ask a question without being in front of everybody on the (Microsoft) Teams.

Sara: Yeah, if I had to give my advice to a teacher, being accessible and know your students’ learning styles.

Rick: You (any student) feel uncomfortable when teachers aren’t around.

Steve: It felt like you were closed off.

Sara: I'd prefer not to do it this way.

Aaron: Interaction with the instructor was kind of missing.

Saul: Yep, I prefer kind of what we're used to you (me) doing.

This conversation yielded data that were categorized and were ultimately subsumed by the theme of negative interaction. This conversation and similar data were used as evidence that neither a ZPD nor the criteria for the systems approach and IET were manifested (Miyazoe & Anderson, 2010; Moore, 1983; Vygotsky, 1979; Wedemeyer, 1981).

***Category: negative learner-content interaction.*** Coded data were categorized as negative learner-content if they reflected an experience or a perception where a participant reported that the modules did not provide an adequate opportunity for learner-content interaction which may have beneficial to their learning to occur. Data from interviews and the panel discussion reflected an insufficient amount of interactivity with the course content, whether it was text-based material, instructor-created PowerPoints, or ancillary videos and articles. Negative learner-content interaction as a category subsumed all data that indicated that the interactions built into the module where the instructor attempted to create a ZPD between students and the course content in the culture unit failed. Examples of this data included when Aaron stated that “examples (of the content provided) were completely lost on me, and the examples are really how I understand how its important.” This quote demonstrates that Aaron, and perhaps his classmates, did not have an adequate grasp of the content and thusly did not learn the content. Nick added that the content PowerPoints are “more memorable if they had been in person” implying that the presentation of content left him less than satisfied and short of a ZPD. Saul

stated that his interaction with the content “stayed about the same” indicating that he did not experience or perceive increased learning. Rick had an even starker assessment of the learner-content interaction, “content interaction with Schoology, impossible!” The systems approach and the IET requirements also did not occur in totality for the participants who reported this data (Miyazoe & Anderson, 2010; Moore, 1983; Vygotsky, 1979; Wedemeyer, 1981).

## CHAPTER 5: DISCUSSION, IMPLICATIONS, AND LIMITATIONS

This mixed methods action research was based upon four research questions. Each of the four questions were answered through quantitative and qualitative research. The following sections will interpret the findings of the research, the implications will suggest how the findings of this study can be applied in secondary Social Studies classes in general, and in APHG courses in particular. Each research question is analyzed in terms of its interpreted findings and the implications for future usage. Last, a section discussing the limitations both to the methodology of the research and of the findings of the research is presented.

### **Discussion**

This section will discuss each research question. First, the findings of the study as they pertain to each research question are discussed in terms of how they are situated within extant literature and previous findings. A general comparison and contrast from this study to significantly similar studies are offered for each research question. Second, each research question is answered using researched data. As recommended by Buss, Zambo, Zambo, and Williams (2014), the complementarity of the qualitative data supporting quantitative data findings is presented for each research question. This analysis is used to support the responses to each research question and to offer commentary on disparate findings or evidence from this study.

**Research Question 1: What are learners' perceptions of the learner-instructor, learner-learner, and learner-content interactions presented via Schoology**

## **interactive modules in an Advanced Placement Human Geography (APHG) culture unit of instruction?**

Learners' perceptions are defined as the attitudes of the participants toward the particular interaction after matriculation through the innovation modules. These attitudes are classified as positive or negative. This research question is addressed in three sections correlating to the particular type of interaction discussed and with a section that synthesizes this data into a conclusion concerning the learners' perceptions of the innovation. Generally, learners' perceptions of all three interaction types were significantly positive after the innovation, meaning students' felt as if the interactivity in the modules enhanced their learning opportunities.

**Perceptions of Learner-Instructor Interactions.** Learner-instructor interaction is defined by Moore (1989) as communications between the teacher and the student that occur throughout the course. Moore also includes the scaffolding that an instructor does as a part of the interaction. This scaffolding is evident in the construction of the modules and how the student actions were familiar and had been rehearsed. For example, in Module 1 students read from their digital textbook and viewed a digital slideshow on Schoology. These activities had been previously modeled and experienced by the students. This pattern helped students have a sense of familiarity with the modules even if the Schoology reliant element of the modules was new.

Laflen and Smith (2017) report that learner-instructor interaction is critical to student learning. Moore (1989) concluded that instructors need to support students with interactions, whether in-person or presented through an LMS such as Schoology. Participants in this study cited these supports as reasoning for a positive perception of the



learner-instructor interactions during the panel group discussion. When prompted to his comfortability with the learner-instructor interactions Saul responded, “I’m comfortable with it.” Aaron complimented this statement, “I do feel like it was very good that you were checking in on us, making sure that we were doing everything correctly.” Steve reported that “I think you were present enough.” These statements confirm the literature in that students expressed that this interaction was the most crucial for their learning. Granted, the participants had not experienced LMS generated interactions before and reported several shortcomings to the interactions experienced. For example, Sara replied that the modules, in terms of interaction with the instructor, were “a good start, but not, it definitely needs a lot of improvement.” Aaron wanted a “more streamlined” process for interaction, and when pressed with a follow up question replied that his definition of streamlined was very much in line with traditional classroom learner-instructor interactions. Rick was blunter, “(The interaction in the modules) not enough!” Again, when pressed, this student elaborated that “there’s basically no communication” and he stressed the delay in feedback as a hinderance to interactivity. Steve added a positive spin on his perceived lack of interactivity with the instructor. He said, “It was nice to try and see how much I could learn without, like, teachers.”

In reviewing these comments, in terms of a critique of interaction with the instructor, it is apparent that this interaction was viewed as the most limited. Limitations in this interactivity are reported as the largest factor in missing an opportunity for meaningful learning (Hall & Miro, 2016; Moore, 1989; Sanders & Golas, 2013). Particularly troubling, the reported data from both interviews and the panel discussion, indicated that delayed feedback was a major obstacle to meaningful learning. This delay

in feedback leads to a loss of engagement and little chance for an effective learner-instructor interaction (Gilboy et al., 2014).

In order to meet the criteria of both the interactivity equivalency theorem and the systems approach, and thusly creating a ZPD, the interactivity in the other two areas would need to be meaningful. Other studies that utilized the ZPD and the IET and SA as a criterion for interactivity in an educational setting indicated this conclusion. A study suggested that learners increase meaningful learning opportunities as they interact with peers, instructor, and content (Peterson & Scharber, 2017). The positive interactive experiences and perceptions reported by my participants in the areas of learner-learner and learner content interactivity reflect that learning occurred. Additionally, a general increase in post assessment scores of the same students indicated that more meaningful learning opportunities were indeed created through the modules; this finding has been reported in multiple earlier studies of interaction (Hall & Miro, 2017; Laflen & Smith, 2017; Moore, 1989; Northrup, 2001; Woo & Reeves, 2007). Specifically, the quantitative data, like the stark increase in scores from pre- to posttest (Pretest  $M = 28.56$ ; Posttest  $M = 45.81$ ) help to frame a generally positive perception of the learner-instructor interactions incorporated into the modules of instruction, despite the qualitative data.

The quantitative data gathered from the surveys and the pretest and posttest overwhelmingly displayed increased student assessment scores, indicating student learning. The qualitative data, from the panel group and interviews, is ambivalent towards the interactivity at best.

**Perceptions of Learner-Learner Interactions.** Learner-learner interaction is defined by Moore (1989) as cognitive and social communications among peers, where

the instructor's presence is not required. This type of interaction has been identified by some researchers as the most significant due to the students' abilities to peer-motivate, peer-critique, and peer-revise (Gašević et al., 2015; Lin et al., 2017; Robinson et al., 2017; Sanders & Golas, 2013). The modules were designed to incorporate exactly these types of peer-interactive activities. Anderson (2003) believed that learner-learner interactions were paramount and can be facilitated through an LMS. In order to meet the criteria of the IET and the systems approach, thus creating a ZPD, I created modules that enhanced student-to-student interactions deemed most crucial to creating a learning opportunity, namely peer-feedback, revision, and discussion (Blackley & Walker, 2017; Eison, 2010; Hew, 2016).

In the panel group discussion, the positive perceptions of learner-learner interactions were discussed at length. Sara for example stated, "It definitely helped me understand some parts in the lesson where I would have understood it wrong If I didn't have peer interaction." Saul expounded, "I personally remember things best if I like have to tell someone about it and like listen too. I think overall it definitely helped me remember." These excerpts from this conversation exemplify the positive perceptions and experiences with each other that the learners had while interacting throughout their progress through the modules. The students indicate that their learner-learner interactions were increased and enhanced through the innovation. The interactions with peers, apart from an instructor, can be highly significant in helping students understand content (Du et al., 2018). Additionally, students who collaborate, especially in a digital format such as in this innovation, score higher on assessments, such as the APHG exam (Sanders & Golas,

2013). These interactions with peers can increase the learning of individuals in a ZPD as described by Vygotsky (1978). Supporting this conclusion, Aaron stated in his interview:

Now connecting the peers and content part, there was one time when as a class all together one day we just put everyone together, where everybody was going over the content, and that was one of the coolest parts of the modules.

This affirmation of the modules, totaled with the preponderance of qualitative data and the quantitative increase in the posttest scores allows me to conclude that the learner-learner interactions fostered through the LMS Schoology was perceived as effective by the learners.

My conclusion is similar to the results found by Laflen and Smith (2017) in that participants reported learner-learner interaction as a crucial element needed for full learning to occur, and that the more interactions with peers, the more learners felt as if they were learning. Repeatedly, studies of interactivity in education settings have confirmed that learner-learner interaction is the most relied upon interaction, and therefore, seen as an integral part of learning (Hall & Miro, 2016; Moore, 1989, Sanders & Golas, 2013). In fact, when Steve indicated, “I feel good about it (learner-learner interaction),” and Aaron said, “That was probably one of the coolest parts,” they were not only reflecting the perceptions of my panel group in total but also reflecting the attitudes of participants in numerous studies who found that learners can receive equivalent learner-learner interactions in a distanced setting (Gašević et al., 2015; Gilboy et al., 2014; Snyder et al., 2016). Although Gilboy et al. (2014) found that their results varied, disconfirming mine, this was largely due to ineffectual planning and implementation of learner-learner interactions by the instructor and did not fully reflect the participant

attitudes (Hall & Miro, 2016; Uzir et al., 2020). Overall, the conclusions discovered in the preponderance of literature support the notion that learner-learner interactions can be fostered through an LMS, when measured by positive student perceptions of the process and product (Shin et al., 2019).

**Perceptions of Learner-Content Interactions.** Learner-content interaction, as defined by Moore (1989), refers to students' working with course material that alters a student's perceptions or understanding of the content. The learning materials in this study were housed on Schoology and included the course textbook, interactive PowerPoints, ancillary articles, maps, and datasets. This content material formed the basis of both the pretest and the posttest used to gather quantitative data.

As the participants progressed through the modules, they frequently had the opportunity to engage and interact with the content. As I noted to the panel group, "You all consistently seem to agree that the content was pretty accessible on Schoology." Access is critical to interaction (Anderson, 2003; Moore, 1989). The participants repeatedly reported that the content was easy to access and was in a familiar format. Sara agreed and felt that the modules allowed "a deep dive into the content." Overall, the perceptions of the participants reflected a positive interaction with the course content that resulted in a positive perception of the learning opportunity created by the instructor and presented through Schoology.

Other research has concluded that learner-content interaction can be fostered through an LMS, for example a study showed a direct link between time spent on content interaction and learners' success (Morris et al., 2006). Another study showed that as students have the independence to organize, utilize, and reference content material that

they will have significantly improved learning opportunities (Shea & Bidjerano, 2014). Students in my study shared this notion of improved learning as a result of content interaction, for example Sara stated “I had more of a chance to like review things” she was reflecting the panel group’s affirmation of the learning opportunities provided in part by their learner-content interactions.

As reflected by both Moore (1989) and Anderson (2003), the interaction with content is why students undergo the learning process. Learning is measured, at least in part, by the content that students can process, analyze, and ultimately understand (Morris et al., 2006). Students who engage more with content learn more content (Shea & Bidjerano, 2014). The participants’ positive perceptions of the learner-content interactions in the modules reflect the meaningful learning that they experienced. These participants are in accordance with students in previous studies who also reported meaningful learning opportunities through well-structured content interactions (Moore, 1989).

**Research Question 2: What barriers are reported by students that hinder meaningful learner-instructor, learner-learner, and learner-content learning while using the Schoology interactive modules in an APHG culture unit of instruction?**

Barriers to learning are defined as obstacles that require some action, guidance, or directives to overcome (Assareh & Hosseini Bidokht, 2011). The barriers reported by the participants reflected challenges with learner-instructor, learner-learner, and/or learner-content interactions. The top three barriers most-discussed by the participants during the interviews and panel discussion are discussed below.

**Barrier 1: Challenges to learner-instructor interaction.** The participants reported that in previous courses, the largest barrier to interaction was due to the inexperience or perhaps incompetence of the instructor, such as when Saul stated, “If I had to give my advice to a teacher: being accessible and know your students and their learning styles.” An instructor’s inability to facilitate interactions can be a significant barrier to learning (Araka et al., 2020; Saini & Goel, 2020; Wilson, 2017). These barriers to learner-instructor interaction can be either (1) a barrier represented by the instructor or (2) a barrier represented by learners.

The most significant barriers to learner-instructor interaction that center on the instructor are inexperience with an LMS (Araka et al., 2020; Saini & Goel, 2020; Wilson, 2017). If a teacher cannot properly organize and utilize an LMS to communicate with students, to foster discussions and peer-interactivity, and to make content available to learners, then the possibility of meaningful learning is diminished significantly (Alenezi, 2018).

Learners are also affected by their comfortability and experience with an LMS; if they can use the LMS, they can learn; if they have issues using the LMS, then learning will be delayed or lessened (Green & Chewing, 2020; Mtshazi & Coleman, 2017). In my findings, Saul expressed his comfortability with Schoology, “Dude, I’ve been using it (Schoology) since 4<sup>th</sup> grade!” which represented over 5 years of usage.

My findings are in concurrence with the general consensus of past research into learner-instructor barriers that found that training, practice, and experience with an LMS for learner and instructor can alleviate or remove these barriers (Baig et al., 2020; Singh et al., 2019; Slavin, 2011). Overall, these barriers are significant because they can hinder

meaningful learning from occurring by hindering the interaction required to gain that meaning (Singh et al., 2019).

To overcome these obstacles, in designing the modules, I followed the seven criteria discussed by Shackelford and Maxwell (2012) in order to provide the highest degree of interactivity possible. Examples of the fulfillment of the criteria include assigning roles for students, frequent planned and unplanned feedback, and a well-structured format. By using the tools offered through the LMS Schoology, I could provide facilitated and effective interactions. Through the implementation of module that was effective I eliminated this barrier to learning for the participants (Alenezi, 2018).

**Barrier 2: Challenges with learner-learner interaction.** A huge barrier to learner-learner interaction is when engagement levels among the learners are unbalanced (Alshorman & Bawaneh, 2018). If participation and the desire to learn is not mutual, it becomes extremely difficult for all parties to effectively learn (Bond et al., 2018). To avoid this barrier, I created interactions, feedback loops, differentiated groupings, and peer-assessments and evaluations. Using these instructional devices can result in the required interactions between peers but cannot guarantee that barriers will be totally removed. “They kind of hindered my education” and “it depended on the kind of people you got grouped with” are representative excerpts from the panel discussion that reflect barriers to interaction.

Barriers to learner-learner interaction such as poorly structured lessons, challenge-less lessons, and ineffectively planned peer interactions are frequently cited in other studies as the most hindering to learners (Alshorman & Bawaneh, 2018; Baig et al., 2020, Nganji, 2018; Truitt & Ku, 2018). Although not covered under the parameters of this



action research, it is logical to assume that students with the most experience with Schoology would performed better on assessments bases off of Schoology-based content. In fact, while not overwhelming, some qualitative data suggests this conclusion. Sara, who moved into the district several years after her peers and therefore has less Schoology experience (they used another LMS at her previous setting) stated, “It’s kind of like the conversation feels cold and I think (Microsoft)Teams did not help” signaling her dissatisfaction with LMS-based instruction. Additionally, Rick stated that in his other courses, “It’s very seldomly used.” Overall, these barriers are significant because they hinder meaningful learning from occurring by hindering the interaction required to gain that meaning (Abdurrahaman et al., 2020; Bond et al., 2018; Lai, 2016; Ross et al., 2019).

To overcome these obstacles, I again employed the recommendations of Shackelford and Maxwell (2012) in the module design to eliminate this barrier to interactivity. Despite the inability to eliminate all barriers to learner-learner interaction, with proper planning and implementation as well as constant instructor monitoring and modification of modules as needed, the barriers were alleviated to a point where learner-learner interaction could result in meaningful learning (Araka et al., 2020). The participants expressed the learning was authentic and meaningful; therefore, the barrier was largely assuaged (Madland & Richards, 2016). For example, during the panel group discussion the conclusion, Saul said, “Overall, it (learner-learner interaction) helped me remember,” and it was unanimously affirmed. As my findings indicated, and reflected by a similar study, utilizing these barrier-reducing activities throughout a lesson has proven to be effective at creating an atmosphere conducive to learning (University of Missouri at Kansas City, 2021).

**Barrier 3: Challenges to learner-content interaction.** Unsurprisingly, the third barrier reported by my participants centered on those that they had with either accessing the content or understanding the content. Rick stated, “It would have been more memorable if it had been in person,” signaling his barrier with content attainment. Sara also presented a barrier with content, “Examples and images were completely lost on me, and examples are how I understand really what is important.” Both Sara’s and Rick’s barriers to content attainment were similar to barriers reported in other interactivity studies, for example Sayfour (2016) noted content knowledge attainment opportunities could be lost without properly scaffolded and structured directives for the learners. Access to the content is a large barrier when learners are using an LMS (Purarjomandlangrudi et al., 2016). My findings concur with those of Alenezi (2018) in that student frustration with content access and attainment must be lessened or eliminated. This barrier is significant because it can hinder meaningful learning from occurring by negatively impacting the interaction required to gain that meaning. Frustrated students may quit or give up on a lesson/module if they feel like they are lost (Xiao, 2017).

To alleviate the barriers with content, I first used the features of Schoology that make access simple, such as a document library, daily postings, and assignment submission tabs. Second, I designed the modules consistently and with a set structure including directives included in each step of every lesson. This practice, as recommended by Xiao (2017), ensures that operational barriers to learner-content are mitigated. The consistent yet varied format of the content (PowerPoints, articles, text, etc.) was suggested by Nilson and Goodson (2017) as a way to reduce or eliminate barriers to

learner-content interaction. The concepts were presented in a variety of formats in order to appeal to a diverse group of student learners, which increases engagement and reduces barriers to interactivity (Purarjomandlangrudi et al., 2016). Students were also provided with a Schoology refresher tutorial and paired with at least one other experienced Schoology user, and they always had the ability to contact me (the instructor) instantaneously, assuring that barriers to learner-content interaction were lessened. In my modules, an increased opportunity to interact with content proved to provide an increased level of engagement. In prior studies, this pattern was evident, and therefore, it was not unexpected when my participants reported a similar pattern (Han & Shin, 2016; Heflin et al., 2017; Hendrix & Degner, 2016).

**Research Question 3: To what extent do students' perceptions of Schoology change after receiving increased interactive lessons presented through Schoology interactive modules during an APHG culture unit of instruction?**

After the innovation, students' perceptions of Schoology changed from relatively indifferent attitudes towards the effectiveness of Schoology to a positive perception. Schoology was seen as a tool that could increase interaction, and therefore, learning opportunities. Thurmond and Wombach (2004) define interaction as "the learner's engagement with the course content, other learners, the instructor, and the technological medium used in the course" (p. 4). Lessons deliberately incorporated more interactions in all three areas into the modules. I had increased the interactivity in these modules first by making them far more reliant on the LMS platform. The innovation was supported by Schoology, which was not the typical classroom experience. Second, students had

structured and mandatory interactions with me (instructor), classmates, and with the content in the modules.

To measure the extent of the student's perceptions of Schoology, the quantitative and qualitative data were used. These data lead me to conclude that the student's perceptions of Schoology have positively increased significantly, to a great extent. The survey results indicated an increase in interactivity. The means of the presurvey subscales ( $M = 28.56$ ,  $SD = 4.56$ ) were far lower than the mean of the postsurvey subscales ( $M = 45.81$ ,  $SD = 8.60$ ) indicating that the participants increased their interactivity and reported it on the Likert-type scale. A consistent pattern of increasing scores is seen in the means of the four subscales from presurvey to postsurvey.

Several students during the panel group discussion directly linked their success to the modules housed on Schoology. For example, Steve said, "In Schoology they've got several tools that allow you to look over, review, see what your previous answers were, and create new submissions." This statement from Steve exemplifies the positive reactions students had towards Schoology. All participants agreed that they would like to see more Schoology usage in their other courses and expressed their interactions benefitted by being accessed through Schoology. These interactions are critical for meaningful learning (Haron et al., 2017). Having gained a meaningful experience, the participants attributed this to at least partially to the LMS Schoology. Prior to the innovation, survey data suggested that most APHG students did not like or see the educational value in Schoology. After the innovation, the perception of the utility of LMS's such as Schoology improved greatly. All participants signified that they would

recommend that teachers use Schoology more in their courses. Aaron exemplified this sentiment as, “Yeah, now Schoology was a useful tool.”

Other studies have found similar findings in situations where participants utilized an LMS to enhance their education. In fact, learners have consistently reported that any increase in LMS usage can result in a better learning (Hendrix & Degner, 2016). The interactivity possible in Schoology-based modules allowed for students to independently progress through the content while still engaging with the instructor and peers, which created meaningful learning opportunity (Balta et al., 2017). In fact, as found by Green and Chewning in 2020, LMS usage is directly linked to increased student success.

**Research Question 4: To what extent does student learning, as measured by a culture unit assessment, increase, or decrease after the learning management system (LMS) driven instructional innovation?**

After the innovation student learning increased significantly as measured by the cultural unit assessment. The great extent to which students learned can be quantified from the pretest-posttest comparison. The descriptive statistics for the assessment ( $n = 16$ ) show that the mean for the posttest ( $M = 45.81$ ,  $SD = 8.60$ ) was significantly higher than the mean of the pretest ( $M = 28.56$ ,  $SD = 4.56$ ) indicating learning occurred. Other studies reflect the findings reported by my participants. Students in AP courses in particular have found the use of LMSs in their coursework to be crucial to successful passage of the AP exams (Heflin et al., 2017). In particular, learners have reported that LMSs offer far more options for interaction with instructors, peers, and content material (Han & Shin, 2016). The results of this study corroborate previous study results that indicate that students perceive that better learning opportunities result from increased

interactions, and that increased interactions are best facilitated through an LMS (Peterson & Scharber, 2017; Woo & Reeves, 2007;).

The results confirm that the systems approach described by Moore and Kearsley (2011) can lead to interactive and meaningful learning experiences for students using an LMS such as Schoology to progress through instructor created modules. These experiences represent students learning in a ZPD (Vygotsky, 1978). The results confirm that the IET of Miyazoe and Anderson (2010) is applicable in this innovation as well. Despite not learning in a traditional environment, my participants found that Schoology can provide equivalent interactions necessary for meaningful learning to occur, thus a ZPD (Vygotsky, 1978) was created allowing for the students to construct meaningful knowledge (Piaget, 1966; Schrader, 2016).

### **Implications**

The implications of this innovation and action research, as recommended by Kumar and Dawson (2014) are discussed in three sections, (1) personal implications in my particular setting and with participants such as those in this study, (2) broader implications for AP teachers in general, and for APHG teachers in particular, (3) and the implications for future research.

#### **Personal Implications**

The implications for my personal growth and future development as a researcher and as an educator are discussed in the following section. Specifically, this section will be subdivided into categories based upon the specific implications that this action research has had upon me. Three subsections are offered, (1) implications for my understanding of research methods and theoretical framework, (2) implications for my teaching practice,

specifically concepts such as classroom management, collaborative assignments, and instructor-provided feedback, (3) and the changed perceptions that I have concerning the utility of LMSs in general and Schoology in particular

**Implications for Research and Theory.** As I progressed through this action research, I gained a new understanding of both research methods and a better knowledge of the theoretical foundations that guide research in the field of education. My understanding of research was limited due to both the time since my last opportunity to perform professional research (nearly 10 years) and by the limited experience I have had overall with research.

First, I was able to gain a grasp of both the mixed methods research design and the action research process. As an educator, this knowledge is critical for personal growth (Plano Clark & Ivankova, 2016). The mixed methods design in particular allowed me to gather both the quantitative data and qualitative data that I needed to make significant conclusions about the ability of my innovation to provide a ZPD for students as described by Vygotsky (1978). By utilizing a survey, pre-posttest, interviews, and a panel group discussion, I could gather significant amounts of data from which to formulate the basis of my results (Greene et al., 1989). Additionally, the results will shape my practice in the future, making me a more informed teacher utilizing research-based instructional models. Improved instruction is a goal of the action research process, and therefore, was appropriate for this study (Mills, 2011; Morgan, 2019). The knowledge of the research process, especially mixed methods action research, will provide a basis for my future growth as an educator (Mills, 2011). I now have the ability to formulate research

questions, review extant literature, and prepare an innovation due to my participation in this undertaking.

Second, I gained a working knowledge of the constructivist concepts of Piaget (1966) and the ZPD of Vygotsky (1978). Generally, I gained insight into the criteria needed for a ZPD as used by both Moore and Kearsley (2011) in the systems approach and Miyazoe and Anderson (2010) in the IET. This knowledge is critical to my professional growth as an educator because the interactions that students' have form the basis of their ability to learn (Moore, 1989). As a teacher, my responsibility is to create the best research-based lessons with measurable objectives for my students and having experience with these concepts will strengthen my practice (Croxtton, 2014).

Additionally, education is moving towards adopting technology such as Schoology at a rapid pace (Sauers & McLeod, 2018). As LMSs are adopted and as unknown phenomena such as the Covid-19 school closures arise, having experience with Schoology and having research and evidence supported pedagogical practices are critical.

**Implications for Teaching.** Through the exploration of the three types of interactivities undertaken in this action research, I have gained a clearer insight into which practices are effective and why they are effective. Students need interactions in order to learn (Moore, 1989). The interactions that I plan in my future practice will include elements of all three types as the more interactivity the more likely to create learning opportunity (Miyazoe & Anderson, 2010). Although it is impractical and unnecessary to include multiple interactions in each student activity, I have learned through my role in this action research that the best way to provide an increased or



enhanced ability to have meaningful learning is through interaction in all areas (Anderson, 2003).

Three pedagogical changes which I will utilize more of in order to enhance interactions in my future practice include a more instructor-learner interaction style of classroom management, learner-learner collaborative assignments, and instructor-provided feedback on informal activities as well as formal evaluations that are content and skill-oriented. These practices will increase the interaction in my classroom and therefore increase learning opportunity (Moore, 1989).

### **Implications for my perceptions of LMS usage.**

Despite the fact that my school district has implemented a district-wide adoption of the LMS Schoology, the decision on how to employ the LMS is largely left to each teacher in my setting. As an early proponent of LMS usage, I was both satisfied with the adoption and dissatisfied with the lack of training, examples, and accountability for teachers. A large part of the impetus for me in undertaking this research was to explore the educational implications of LMS usage, especially as reported by student users. Additionally, the rapid adoption of LMSs, as mentioned by Sauers and McLeod (2018), made me curious as to the capabilities of Schoology. Throughout the planning and implementation of my innovation, I matched a desired interaction with a correlating module housed on Schoology. This meant that as my participants worked through the modules, they would have to rely upon Schoology as their center of learner-instructor communication, learner-learner collaboration, and peer-assessment, as well as the house for content. From the innovation and subsequent data analysis, I have concluded that LMS in general and Schoology in particular can be used to enhance learning due to the

ability to foster an environment needed to create a ZPD for the students (Vygotsky, 1979).

### **Implications for Secondary Social Studies/APHG**

As a nearly twenty-year veteran teacher of both Social Studies instruction and the AP program, I have a personal and professional interest in the implications of this study to the larger field. This section first discusses the implications for Secondary Social Studies followed second by a section on the implications for AP teachers and students.

**Implications for Secondary Social Studies.** From the results of my innovation, inferences that affect high school Social Studies courses such as the one in which I am the instructor can be made. First, as suggested by Stone (2017), computers with LMS programs should aid students in Social Studies comprehension as maps, graph, charts, videos, articles, indices, and databases for example can all be housed on an LMS. These tools and others like them are key to achieving competency on core Social Studies standards.

A frequent variable for students in Social Studies courses is time (Uzir et al., 2020). Management of time is a skill that requires practice, this practice can be facilitated through an LMS because features such as time stamping downloads, posts, and uploads allows the instructor to monitor student progress and adjust instruction as needed.

A second Social Studies-related implication is the ease through which formerly bulky tools, such as an atlas, can be digitalized and housed on an LMS. This eliminates confusion and can streamline a course such as geography. For example, prior to the adoption of Schoology, my students were required to bring a physical textbook, and atlas, a reference ancillary text, a notebook, pens, paper, and colored pencils to class each day.

With Schoology each of those items has been transferred to a digital form. This ease of access alone can make students perceive of their Social Studies courses differently and more positively (deKoster et al., 2017). My participants viewed Schoology as a way to help teachers create interactive lessons in large part due to the organization, access, and ease-of-use of Schoology, as well as the familiarity with LMSs that these students prepossessed. The general continued expansion of LMSs (deKoster et al., 2017) should and will reflect an expansion into Social Studies courses in particular and the innovation researched in this study adds to the data justifying such an expansion.

**Implications for AP courses.** AP courses have a reputation for being traditional (Elmhurst University, 2019; Paek et al., 2005). This means that technology innovations such as an LMS are not expected to be utilized as frequently as a traditional class due to the reliance upon a classical model of instruction. Traditional class refers to the lecture-discussion model, which is widely used in APHG classrooms (Paek et al., 2005). This teaching method is largely instructor-centered and follows a pattern of individual student research and reflection upon textual readings. While this concept of traditionality may be a common perception, it is inaccurate. LMS usage in AP courses is both frequent and recommended (The College Board, 2021). In fact, the College Board (2021) has created an instructional and assessment practice LMS known as AP Classroom. This LMS offers features that are geared directly towards each individual AP student and their respective classes. Lanegran and Zeigler (2016) viewed the expanded usage of LMS technology in AP courses to be inevitable. Research such as this innovation done purposefully with AP students can help to justify the continued expansion of LMSs in AP classes. In fact, the College Board (2021) is pushing forward with its LMS, “AP Classroom is constantly

updating thanks to feedback from educators and students (p. 1).” Although my students received their interactions through the teacher-created modules housed on Schoology and not on AP Classroom, the implication is that any added research which demonstrates the educational usefulness of LMS will be significant in helping to advance the usage of them by instructors.

### **Implications for Future Research**

Future research can focus on developing this topic further by exploring three related questions which arose during the research process. These three questions will be discussed followed by a consideration for my next phase as a researcher. The three questions which resulted after reflecting upon the results of this action research are (1) Would I reconsider any parts of the innovation? (2) Would I reconsider my research design? and (3) Would I anticipate similar/divergent results with reconsiderations applied? The answers to these questions along with a plan to continue exploration of this topic are offered below.

**Reconsidering the Innovation.** This innovation was created to answer the research questions concerning learners’ perceptions of the utility of LMS and of barriers to proper usage of LMS. In retrospect, focusing solely on the interactivity and ignoring barriers may have narrowed the scale of this action research and made the results more significant (Johnson, 2008; Mills, 2011; Morgan, 2019). Interactivity is the critical variable that I attempted to measure as it can be a determinate in creating meaningful learning (Moore, 1989). By including barriers to interactivity, I may have directed my analysis and research away from interactivity (Hewitt & Little, 2005; Xiao, 2017).

Another innovation change could be to the number of participants followed for the qualitative analysis. At a group of only five, my data were representative of the whole class but obviously limited to the actual perceptions of these five (Hine, 2013). By limiting the number of participants, I did make the innovation and research more manageable (Greene et al., 1989). However, an expanded participant pool could have yielded more significant data, especially in consideration of subgroups within the population, such as those of gender, race/ethnicity, socio-economic background etc. (Rudestam & Newton, 2007).

**Reconsidering the Research Design.** Using action research was appropriate for this innovation because it is designed to aid educators in identifying and creating a solution to a problem (Plano Clark & Ivankova, 2016). Specifically, I was interested in gaining a better understanding of how I teach and how students learn which is an outcome of action research (Mills, 2011).

In choosing an action research design, I decided upon a mixed methods study as it offers the most useful and pragmatic data upon which alterations can be made in my setting (Morgan, 2019). By using both quantitative analysis and qualitative analysis, I broadened the amount of data from which I could draw conclusions about student perceptions (Johnson, 2008). As more instruction is aided by LMSs, having an understanding of student perceptions of those LMSs is critical information for educators to base reflection and revisions upon (Findik-Coskunçay et al., 2018). Additionally, using mixed methods allowed me to contribute to the literature concerning the IET, which is under researched (Xiao, 2017).

Although it may have been more streamlined to take a purely qualitative or quantitative approach, neither alone could provide a preponderance of data upon which to base educational practices, as well as the action research mixed methods design (Hewitt & Little, 2005; Hine, 2013; Rudestam & Newton, 2007).

**Continuation of the Research.** The goal of action research is to help an educator solve or address an identified problem (Mills, 2011). Although this may not infer a continuous cycle for all educators, to me, it clearly indicates that action research is a tool to address problems of practice as they arise. In general, teachers face problems of practice regularly (Plano Clark & Ivankova, 2016). In particular, I am highly interested both in continuing research into questions of interactivity in order to revise and enhance my lessons. My lessons, if highly interactive, will provide meaningful learning opportunities (Miyazoe & Anderson, 2010). To identify, revise, and implement enhanced interactive lessons, I need to accumulate more data from a wider variety of students, from dissimilar settings, and in varied courses.

Continued research in this topic should also include an exploration of LMS usage in other settings. I evaluated a situation where students' interactions were guided by the instructor through Schoology. Other studies should more rigorously investigate the perceptions of students using LMSs in other settings, such as school closures including shutdowns due to yearly occurrences like weather phenomenon to more stark situations like the Covid-19 closures in 2020. Additionally, research into a wider variety of students should occur. I researched the perceptions of APHG students in a very structured setting. Students who use LMSs come in all varieties of age, gender, socio-economic background, race, ethnicity, development level, etc. (Sauers & McLeod, 2018). The

perceptions of various students from a wide variety of backgrounds would better reveal the overall interactive utility of LMSs than my limited action research study.

Extant research has focused mostly on much broader topics, such as how students construct meaning and learning through interactions (Lin et al., 2017; Peterson & Scharber, 2017; Schrader, 2016). Although valuable, more research into specific contexts, such as school level (e.g., elementary, secondary, postsecondary), will enhance the overall knowledge of student interactions. Interactivity itself has been the subject of much research, but most of that research has focused on the interactions between learner and instructor, peers, and content without the intermediary use of an LMS (Gilboy et al., 2014; Snyder et al., 2016). This extant research can be added to through studies such as this one, where specific types of students are solicited for their perceptions in a very specific setting. If the results of other studies correlated with my results, then perhaps the implications would affect more than the students in my setting, and educational researchers can build a broader, more encompassing body of literature.

### **Limitations**

After considerable reflection upon this action research undertaking several factors that could have been altered or strengthened became evident. These weaknesses are categorized as methodological limitations or as limitations in the findings and will be discussed in order.

#### **Methodological**

Action research is designed to aid educators solve problems of practice (Greene et al., 1989; Johnson, 2008; Mills, 2011; Parsons & Brown, 2002). Despite this, several limitations to action research have been noted by past researchers and were also

identified throughout this research. One limitation of action research is that the role of the teacher as both researcher and as acting educator is difficult to balance (Johnson, et al., 2012). Teachers instinctively want to support and nurture their students while a researcher must remain isolated and nonbiased (Kelleher & Whitman, 2018). I found that this line was difficult to maintain. My students are first time high school students and first time AP students. This, in my experience, tends to make them more fragile and in need of direct instruction. This research in particular required me to isolate myself as an instructor and focus on my role as researcher. This limitation is common in action research because teachers are not trained to be scientific researchers. We are taught philosophies of education, educational psychology, and multiple pedagogical models (Gebhard, 2005).

I addressed this limitation by bracketing my experiences and frequently reflecting in my researcher's journal. This helped me to delineate my dual roles much more effectively. In future research, I can address these limitations by employing clear guidelines for myself but also for participants in the study. My students had a difficult time divorcing my teaching role from my role as researcher and this limited some of the data.

## **Findings**

The findings suggest that the perceptions of the learners toward the interactions presented via Schoology were positive. Students reported that they could overcome barriers to the interactions. Students changed their perceptions from one of general indifference towards Schoology to one of value. This aided the students in greatly increasing their scores from pretest to posttest in the culture unit of APHG.



Limitations to these findings are that participants may have been experiencing the novelty effect where the students improved due to the newness and difference of the technology, in this case Schoology modules, and not actually have perceived increased interactivity (Jeno, Vandvik, Elliassen, & Grytnes, 2019). Challenges to both my qualitative and quantitative data could be made upon this premise.

Like all action research, this study is limited by its lack of generalizability (Yarkoni, 2022). This means that overall, my conclusions are limited to my participants in this particular setting.

Last, as previously indicated, the participant sample was limited to the demographics of the setting. Additional research pairing interactive Schoology modules with a variety of students in an array of varied course, including other AP courses, will address this limitation and add to the existing body of knowledge on the systems approach, IET, and the ZPD.

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## . APPENDIX A: PRE-SURVEY

Thank you for your voluntary participation and consent to use the collected data in this survey! The purpose of the survey is to collect students' evaluations concerning Schoology and the interactions provided by Mr. Plonski.

1. How often do you, on average, discuss content with your teacher (course updates, homework postings, or direct messages) through Schoology thus far this school year?  
 everyday    almost every day    sometimes    rarely    never
  
2. How often do you, on average, discuss content with classmates (course updates, homework postings, or learner collaborative posts) through Schoology thus far this school year?  
 everyday    almost every day    sometimes    rarely    never
  
3. How often do you, on average, access content (assignments, readings, folders) through Schoology thus far this school year?  
 everyday    almost every day    sometimes    rarely    never
  
4. When you access instructor-created modules on Schoology, how useful do you find the interactions with the teacher (questions, comments, discussions, lecture-casts, etc.)?  
 extremely useful    moderately useful    occasionally useful    rarely useful  
 never useful

5. When you access instructor-created modules on Schoology, how useful do you find the interactions with the course content (text, articles, resources, etc.)?
- extremely useful   moderately useful   occasionally useful   rarely useful  
never useful
6. When you access instructor-created modules on Schoology, how useful do you find the interactions with other students (posts, discussions, lecture-cast comments, etc.)?
- extremely useful   moderately useful   occasionally useful   rarely useful  
never useful
7. On average, how difficult is it to use Schoology to collaborate with classmates?
- extremely difficult   moderately difficult   occasionally difficult   rarely difficult   never difficult
8. On average, how difficult is it to use Schoology to access course content?
- extremely difficult   moderately difficult   occasionally difficult   rarely difficult   never difficult
9. On average, how difficult is it to use Schoology to communicate with the teacher?
- extremely difficult   moderately difficult   occasionally difficult   rarely difficult   never difficult
10. Overall, how would you rate Schoology’s usefulness to your learning?
- extremely useful   moderately useful   occasionally useful   rarely useful  
never

*Note.* Questions adapted from “The Development of a Survey Instrument to Measure Transactional Distance in Secondary Blended Learning Environments” by D. Lane, 2017, *Concordia University Portland Research, Spring*, p. 114. And from “Transactional Distance as a Predictor of Perceived Learner Satisfaction in Distance Learning Courses: A Case Study of Bachelor of Education Arts Program, University of Nairobi, Kenya,” 2014, *Journal of Education and Training Studies*, 2(2), p. 176-188.



## APPENDIX B: QUIZ/FRQ

1. Which statement about culture is NOT true?
  - A. Culture is the traditions and beliefs of a group of people.
  - B. Culture is learned behavior that is passed from one generation to the next.
  - C. Cultures are static and never changing.
  - D. Cultural traits are a reflection of a group's values.
  - E. None of the above.
  
2. The theory that the physical environment *causes* social and cultural development is called  
called
  - A. environmental ecology.
  - B. cultural ecology.
  - C. cultural determinism.
  - D. environmental determinism.
  - E. environmental landscape.
  
3. The area of origin of a culture is called
  - A. cultural environment.
  - B. cultural homeland.
  - C. culture hearth.
  - D. cultural landscape.
  - E. culture realm.

4. Relocation diffusion is
- A. the rapid and widespread diffusion of a characteristic throughout the population.
  - B. the spread of an underlying principle or idea.
  - C. the spread of an idea from persons of power to other persons.
  - D. the spread of an idea or trait through the physical movement of people from one place to another.
  - E. none of the above.
5. Which of the following is NOT an example of relocation diffusion?
- A. The spread of baseball to Japan.
  - B. The spread of English to the British Colonies.
  - C. The spread of AIDS to the United States.
  - D. The spread of Roman Catholicism to Latin America.
  - E. The spread of hip-hop from Atlanta to Springdale
6. Which of the following is an example of hierarchical diffusion?
- A. The spread of Spanish language to Latin America.
  - B. The spread of laptop computers from the upper class to the middle class.
  - C. The spread of AIDS from Africa to Europe.
  - D. The spread of Wal-Mart from Arkansas to the rest of the United States.
  - E. All of the above.
7. A geographic assemblage of related culture regions is
- A. a cultural environment.

- B. a cultural realm
  - C. a culture hearth.
  - D. a cultural landscape.
8. Which of the following areas is not considered a cultural realm?
- A. Latin America.
  - B. Anglo America.
  - C. Europe.
  - D. New England.
  - E. Sub-Saharan Africa.
9. Which of the following is an example of a cultural region?
- A. The Rocky Mountain Region.
  - B. The Gulf Coast
  - C. The South
  - D. The Bible Belt
  - E. All of the above
10. Cultural diffusion is
- A. the idea that your own culture is superior to others.
  - B. the spread of culture traits from one group to another.
  - C. the isolation of a culture from the rest of the world.
  - D. the innovation of a cultural trait.
  - E. none of the above

11. Mentifacts are closely similar to:

- A. technological subsystems.
- B. materialsubsystems
- C. sociofacts.
- D. ideological subsystems.
- E. none of the above.

12. This is the process by which a less dominant culture adopts some of the traits of a more dominant culture.

- A. Cultural assimilation.
- B. Acculturation.
- C. Syncretism.
- D. Migrant diffusion.
- E. Transculturation.

13. This is the process by which a less dominant culture adopts the traits of or is absorbed into a more dominant culture is:

- A. Cultural assimilation.
- B. Acculturation.
- C. Syncretism.
- D. Migrant diffusion.
- E. Transculturation.

14. Popular Culture is characterized by all of the following except

- A. quickly changing attributes.
- B. homogeneous population.
- C. urban population.
- D. globalization.
- E. uniform landscapes.

15. An example of a popular culture holiday that has transcended its folk culture roots is

- A. Memorial Day.
- B. Fourth of July.
- C. Christmas Day.
- D. Labor Day.
- E. None of the above

16. Examples of non-material or intangible aspects of culture include all of the following except

- A. clothing.
- B. belief systems.
- C. practices.
- D. values.
- E. traditions.

17. Material or tangible aspects of culture include

- A. art.
- B. clothing
- C. sports.
- D. foods.
- E. all of the above.

18. Which two cities in the United States often serve as hearths for popular culture?

- A. New York and Chicago.
- B. New and Miami.
- C. New York and Los Angeles.
- D. Los Angeles and Detroit.
- E. Detroit and Nashville.

19. Which three cities in the world often serve as hearths for popular culture?

- A. Tokyo, New York, and London.
- B. New York, London, and Paris.
- C. London, Paris, and Los Angeles.
- D. Los Angeles, Berlin, and Tokyo.
- E. Tokyo, Paris, and Los Angeles.

20. Which of the following are *least* likely to diffuse popular culture around the world?

- A. American news organizations, such as CNN.
- B. Hollywood movies.

- C. American TV shows.
- D. Religious leaders
- E. Social Media

21. People most often practice their folk customs instead of pop culture because

- A. popular culture items are often expensive to buy.
- B. they do not want to harm their environment.
- C. they want to preserve their traditional cultures.
- D. a lack of exposure to popular culture.
- E. all of the above.

22. All of the following are characteristics of folk cultures except

- A. folk culture populations are usually small.
- B. folk cultures are spread hierarchically.
- C. folk cultures have a homogeneous population.
- D. folk cultures must use local materials when building.
- E. folk cultures eat mostly foods that locally available.

23. Folk culture is transmitted from one location to another primarily through

- A. relocation diffusion.
- B. trans-national corporations.
- C. war and occupation.
- D. television and other media.

E. religion.

24. How do folk cultures tend to perceive their environment?

A. Folk cultures perceive the environment as a hostile place.

B. Folk cultures believe that nature exists to enrich them.

C. Folk cultures seek to create a uniform landscape.

D. Folk cultures have great reverence for their environment.

E. All of the above.

25. In folk societies, materials used for building homes

A. are selected for the recyclable properties.

B. are often imported from distant countries.

C. are available locally.

D. are symbolic in nature.

E. none of the above.

26. Which is NOT an example of a folk cultural landscape in the United States?

A. Amish communities in Pennsylvania

B. Pueblo communities in New Mexico

C. Log cabins in Appalachia.

D. Salt Box homes in New England.

E. Sloped roofs in Hawaii.



27. What is the term for a group of people who identify their cultural with a specific homeland or place?

- A. Race.
- B. Ethnicity.
- C. Nationality.
- D. Nation.
- E. All of the above.

28. Ethnocentrism is

- A. the fear of outsiders.
- B. the belief that Westerners are superior to African and Asian cultures.
- C. the belief that one's own religion is superior to others.
- D. the belief that one's own ethnic group is superior to others.
- E. the belief that one's own culture is superior to all others.

29. Cultural Landscape is **best** defined as:

- A. the balance between human actions and natural forces on the environment
- B. the effects of people on the land
- C. the effects on culture caused by the physical environment
- D. the way the physical world affects culture
- E. how people use their environment

30. The rise in popular culture is most damaging because:

- A. it inversely affects folk culture
- B. pop culture artifacts produce or are pollutants
- C. pop culture diversifies uniform regions
- D. pop culture varies regionally
- E. All of the above

31. Apartheid, a policy of racial segregation from 1948-1990, was the official policy of which country's government?

- A. Zimbabwe.
- B. South Africa.
- C. Ghana.
- D. Kenya.
- E. Tanzania.

32. The largest minority group in the United States is

- A. African-Americans.
- B. Jews.
- C. Hispanics.
- D. Asian-Americans.
- E. Native Americans.

33. In Canada, the greatest concentration of Asians lives in which city?

- A. Montreal, QC.

- B. Winnipeg, MB.
- C. Ottawa, ON.
- D. Calgary, AB.
- E. Vancouver, BC.

34. In large cities, people with the same culture often live in segregated areas called

- A. the suburbs.
- B. ethnic enclaves.
- C. cultural agglomerations.
- D. cultural exclaves.
- E. ethnic agglomeration.

35. A payment of money or goods from the family of a bride to the groom's father is called a

- A. marriage tax.
- B. Groom's gift
- C. dowry.
- D. bridal tithe.
- E. marital gift.

36. A patriarchal society is one that

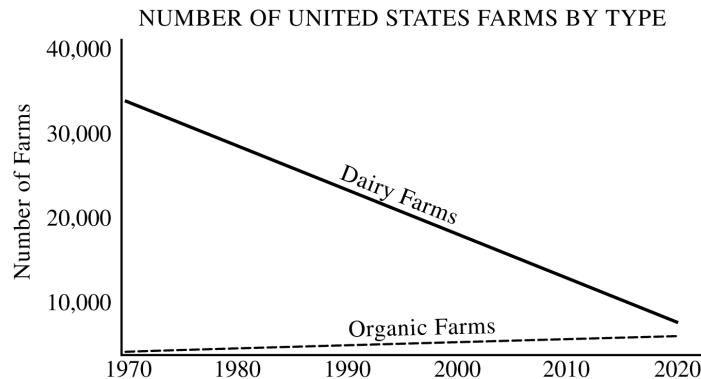
- A. favors females over males.
- B. favors males over females.

- C. has equality between males and females.
- D. forces women to bear children.
- E. none of the above.



1. Culture systems, such as the production of coffee, are part of a global network. (7 points)

- A. Describe a common characteristic shared by the coffee producing countries shown on the map.
  - B. Explain two developmental and/or culture impacts of coffee farming on coffee producing countries.
  - C. Identify and explain one way increased coffee consumption outside of coffee growing areas affects its production.
-



2. Culture in the United States has changed significantly in the past few decades. With respect to the past, present, and projected trends in culture shown in the diagram above, answer the following: (7 points)
- A. First identify and then explain TWO factors contributing to the steady decline in the number of dairy farms since 1970.
  - B. First identify and then explain TWO factors contributing to the increase in the number of organic farms since 1970.
3. Culture in the United States has changed significantly in the past few decades. With respect to the past, present, and projected trends in culture shown in the diagram above, answer the following: (7 point extra FRQ)
- A. First identify and then explain TWO factors contributing to the steady decline in the number of dairy farms since 1970.
  - B. First identify and then explain TWO factors contributing to the increase in the number of organic farms since 1970

## APPENDIX C: SELF/PEER EVALUATION

Module #: \_\_\_\_\_

Directions: please evaluate yourself and your reading group peers on a 1-5 scale with one representing MINIMAL contribution and 5 representing MAXIMUM contribution.

Formulated Prompt	Self	Peer 1	Peer 2	Annotations
Participated in group discussions				
Understanding of the material				
Contribution to the team hypothesis				
Contribution to the team consensus				
Overall evaluation				

Notes:

## APPENDIX D: POST-EVALUATION

Date:

Module #: \_\_\_\_\_

Directions: please evaluate yourself and your reading group peers on a 1-5 scale with one representing MINIMAL contribution and 5 representing MAXIMUM contribution.

Formulated Prompt	Self	Peer 1	Peer 2	Annotations
Participated in group discussions				
Original post furthered discussion				
Follow-up post furthered the discussion				
Contribution to the team consensus				
Overall evaluation				

Notes:

## APPENDIX E: POWERPOINT EVALUATION

Directions: please evaluate yourself and your reading group peers on a 1-5 scale with one representing MINIMAL contribution and 5 representing MAXIMUM contribution.

PowerPoint Subjects: Two Schools of thought developed by two cultural geographers

- Leslie White – (American: University of Michigan)
- Julian Huxley – (British: Oxford)
- Similar ideas about how culture changes and is transmitted to future generations.
- Both believed that culture could be broken down into 3 components. Each component could be carried on to future people in a culture. Similar ideas...both break culture down into 3 basic parts....3 parts of culture...different terminology

Formulated Prompt	Self	Peer 1	Peer 2	Annotations
Participated in group discussions				
Understanding of the material				
Contribution to the team research				



Contribution to the team PowerPoint				
Overall evaluation				

## APPENDIX F: POST-SURVEY

Thank you for your voluntary participation and consent to use the collected data in this survey! The purpose of the survey is to collect students' evaluations concerning Schoology and the interactions provided by Mr. Plonski during the culture unit.

1. How often did you, on average, discuss content with your teacher (course updates, homework postings, or direct messages) through Schoology during the culture unit?  
 everyday    almost every day    sometimes    rarely    never
2. How often did you, on average, discuss content with classmates (course updates, homework postings, or learner collaborative posts) through Schoology during the culture unit?  
 everyday    almost every day    sometimes    rarely    never
3. How often did you, on average, access content (assignments, readings, folders) through Schoology during the culture unit?  
 everyday    almost every day    sometimes    rarely    never
4. When you accessed instructor-created modules on Schoology, how useful did you find the interactions with the teacher (questions, comments, discussions, lecture-casts, etc.) during the culture unit?  
 extremely useful    moderately useful    occasionally useful    rarely useful  
 never useful

5. When you accessed instructor-created modules on Schoology, how useful did you find the interactions with the course content (text, articles, resources, etc.) during the culture unit?

- extremely useful   moderately useful   occasionally useful   rarely useful  
never useful

6. When you accessed instructor-created modules on Schoology, how useful did you find the interactions with other students (posts, discussions, lecture-cast comments, etc.) during the culture unit?

- extremely useful   moderately useful   occasionally useful   rarely useful  
never useful

7. On average, how difficult was it to use Schoology to collaborate with classmates during the culture unit?

- extremely difficult   moderately difficult   occasionally difficult   rarely  
difficult   never difficult

8. On average, how difficult was it to use Schoology to access course content during the culture unit?

- extremely difficult   moderately difficult   occasionally difficult   rarely  
difficult   never difficult

9. On average, how difficult was it to use Schoology to communicate with the teacher during the culture unit?

- extremely difficult   moderately difficult   occasionally difficult   rarely  
difficult   never difficult

10. Overall, how would you rate Schoology's usefulness to your learning during the culture unit?

- extremely useful   moderately useful   occasionally useful   rarely useful  
never useful

*Note.* Questions adapted from "The Development of a Survey Instrument to Measure Transactional Distance in Secondary Blended Learning Environments" by D. Lane, 2017, *Concordia University Portland Research, Spring*, p. 114. and from "Transactional Distance as a Predictor of Perceived Learner Satisfaction in Distance Learning Courses: A Case Study of Bachelor of Education Arts Program, University of Nairobi, Kenya," 2014, *Journal of Education and Training Studies*, 2(2), p. 176-188.

## APPENDIX G: INTERVIEW PROTOCOL

Date:

Student: 1    2    3    4    5

Formulated Prompt	Response	Annotations
Describe/and provide an example of the effectiveness of the student-teacher interaction provided		
Describe/and provide an example of the effectiveness of the student-to-other-student interaction provided		
Describe/and provide an example of the effectiveness of the student-to-content interaction provided		


<p>Describe how you might change the modules (including its layout and format)</p>		
<p>Describe the modules in terms of their ease of use (which parts were clear or unclear)</p>		
<p>Please illustrate a time when you were aware of the enhanced interactions during the culture unit? How was this different from previous course interactions? Please provide a specific example.</p>		
<p>Please discuss past experiences using</p>		

<p>Schooling and compare them to the current experience. Describe the specific differences.</p>		
<p>Did you notice any changes in the interaction as you progressed through the unit?</p>		
<p>List any other thoughts or comments (open-ended)</p>		

*Note.* Questions adapted from “Revisiting Transactional Distance Theory in a Context of a Web-Based High-School Distance Education” by E. Murphy and M.A.R. Rodriguez-Manzanares, 2008, *Journal of Distance Education*, 22(2), p. 1-14.


## APPENDIX H: IRB APPLICATION

Tradition. Excellence. Innovation.



November 17, 2020

Mr. Daniel Plonski



Re: Research Permission

Dear Mr. Plonski,

This letter is in response to your request to conduct research at Spartanburg High School in order to obtain your doctoral degree. Your request has been approved. I hope your research and quest for your doctoral degree will be rewarding.

Please let me know if I may be of further assistance to you.

Sincerely,



TP/CA

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## APPENDIX I: PANEL GROUP PROTOCOL

Student: 1    2    3    4    5

Formulated Prompt	Response	Annotations
Tell me your perceptions of Schoology’s instructor-student interactions during the culture unit?		
How often did you interact with the instructor? Describe to me how the interactions helped or hindered your comprehension?		
Based on experience, what is your evaluation of the Schoology- based learner-instructor interaction? Please consider positive and negative impressions.		
Tell me your perceptions of Schoology’s learner-learner		

interactions during the culture unit?		
How often did you interact with other learners?		
Describe to me how the interactions helped or hindered your comprehension?		
Based on your experiences, what is the single-most beneficial advantage of Schoology-based learner-learner interaction?		
Based on your experiences, what is the single-most challenging aspect of Schoology-based learner-learner interaction?		
Tell me your perceptions of Schoology's learner-content		

interactions during the culture unit?		
Describe to me how the interactions helped or hindered your comprehension?		
How did your previous usage of LMS's like Schoology prepare you for the interactive culture unit?		
Which of the three interactive areas was the most difficult to produce through Schoology?		
Any additional comments on the barriers to interaction that exist while using Schoology?		

<p>Tell me if the culture modules changed your perceptions of Schoology? If yes, then how?</p>		
<p>Would you like to receive more interactive lessons via Schoology? Why or why not?</p>		
<p>What advice would you give to other students engaged in interactive Schoology lessons?</p>		
<p>What advice would you give to teachers trying to create interactive Schoology lessons?</p>		

## APPENDIX J: PARENT CONSENT FORM

Hello,

In May your 9<sup>th</sup> or 10<sup>th</sup> grade student will be taking their first ever Advanced Placement Exam. My goal is to assure each student the best possible learning experience that I can.

In order to best prepare students and to improve my teaching, I have undertaken the process of acquiring a doctoral degree in curriculum and instruction from a southeastern state university. In order to earn this degree, I must complete a dissertation which requires that I research the educational opinions of the students concerning the use of learning management systems such as Schoology. Students will be asked to complete a pre- and a post- instructional survey, may be asked to participate in a voluntary panel group discussion, and may be asked to be interviewed by me concerning Schoology's ability to provide the learner-content, learner-instructor, and learner-peer interactions needed for a meaningful learning experience.

All information obtained from students will be completely anonymous and in absolutely no way is participation necessary. Participation in this study is completely voluntary for the students. Participation has no effect on the students' grades whatsoever. I will host a voluntary Microsoft TEAMS question and answer meeting in January for any interested parent. I will also meet with any parent at an open meeting to be held at Springdale High in January. Additionally, any parent or student can contact me concerning this research study at any time via \_\_\_\_\_

Thank you in advance for your support and participation,

Daniel Plonski

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## APPENDIX K: STUDENT PERMISSION

In May your 9<sup>th</sup> or 10<sup>th</sup> grade student will be taking their first ever Advanced Placement Exam. My goal is to assure each student the best possible learning experience that I can.

In order to best prepare students and to improve my teaching, I have undertaken the process of acquiring a doctoral degree in curriculum and instruction from a southeastern state university. In order to earn this degree, I must complete a dissertation which requires that I research the educational opinions of the students concerning the use of learning management systems such as Schoology. Students will be asked to complete a pre- and a post- instructional survey, may be asked to participate in a voluntary panel group discussion, and may be asked to be interviewed by me concerning Schoology's ability to provide the learner-content, learner-instructor, and learner-peer interactions needed for a meaningful learning experience.

All information obtained from students will be completely anonymous and in absolutely no way is participation necessary. Participation in this study is completely voluntary for the students. Participation has no effect on the students' grades whatsoever. Please return this permission form to Mr. Plonski in room xxxx. Additionally, any parent or student can contact me concerning this research study at any time via [drplonski@xxxxxxxx](mailto:drplonski@xxxxxxxx)

Thank you in advance for your support,

Daniel Plonski

I give permission for my child to participate in Mr. Plonski's research:

I DO NOT give permission for my child to participate in Mr. Plonski's research:

Student name (printed) \_\_\_\_\_

Parent/guardian name (printed) \_\_\_\_\_



## APPENDIX L: SYLLABUS

Springdale High School

Advanced Placement Human Geography

2021-2022

- Room xxxx
- Office Hours: Monday-Thursday 7:45-8:10 am (or by appointment)
- xxx-xxx-xxxx (ext. xx)
- drplonski@xxxxxxxx

Course Information

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*Description:* AP Human Geography is a course that replicates the rigor and intensive study present at the collegiate level. The course focuses on the human-environment interactions that shape life on earth. The human and physical processes studied include nature of and perspectives on geography, population, movement of people and goods, culture, language, religion, past and present political geography, physical geography, economic activities from culture to land use and industry, and cities and urbanization. Through the exploration of these topics students will develop higher level Social Studies skills including map, chart, and graph study and the application of spatial relationship data on varied scales from local to global, the interpretation of the implications of human interactions and location and identifying the significance of the interconnected relationships between earth's regions and peoples.

- *AP Exam:* All students are required to take the AP Human Geography Exam in May. The exam is 50% multiple choice and 50% Free Response Questions. Major assessments in this course will model this format in order to best prepare students for the exam.
- *Prerequisites:* Students must have scored a minimum of 550 on the Verbal PSAT and have achieved 90% or higher final scores in 8<sup>th</sup> grade Social Studies and ELA.

#### Textbook & Course Materials

- 
- *Required Text:* Text: Rubenstein, J. M. (2015). *The Cultural Landscape: An Introduction to Human Geography*. (12<sup>th</sup> ed.). Prentice Hall: Upper Saddle River, N.J
  - *Supplementary Reading Materials:* Select articles from periodicals, journals, national newspapers will be provided.
  - *Videos:* Quality instructional and enrichment videos will be used for instructional purposes. All videos will have the approval of the principal and will require prior parental approval

*Technical Requirements:* Students are provided with a MacBook Air, school-wide internet access, and a Course Sites course management system account and location and identifying the significance of the interconnected relationships between earth's regions and peoples. *AP Exam:* All students are required to take the AP Human Geography Exam in May. The exam is 50% multiple-choice and 50% essay.

#### Course Structure

- This course will be delivered entirely online through the Schoology course. This course is designed as a fourteen module, blended asynchronous and synchronous, learning experience. The course is 100% facilitated online and is delivered through the Schoology LMS.
- Technical support is available through the MacBook Help Desk (room 1124).

#### Learning Activities & Participation

- *Discussion Participation* is utilized for student assessment. In order to prevent misunderstanding or interpretation of this component, a rubric or policy for how that grade is derived is provided in the course documents. Expectations for discussion quality are posted in the course documents.
- *Discussion Commentary* is required for this course. Students are expected to create one original post per module and reply to at least 2 other student posts. *Student behavior*. Student digital behavior policies, as articulated in the SHS student handbook and provided by the school, will be observed at all times
- This course is designed as a fourteen module, blended asynchronous and synchronous, learning experience. The course is 100% facilitated online and is delivered through the Schoology LMS.
- Technical support is available through the MacBook Help Desk (room 1124)
- Grading

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Assignment/Activity Name	Description	Percentage
Discussion posts	Initial post plus at least 2 responses	10
Team/self-evaluations	Address provided prompts	10

Lecture cast progress checks	Emailed to the instructor	10
Project	Directions/rubric found in the Module 15 Documents Tab	20
Free-Response Question	Response to the prompt posted at the culmination of Module 1 in the Assessments Tab	25
Multiple-Choice	Responses to the Web-based quiz posted in the Module 1 Assessments Tab	25
Total		100

Grades and Learning Assessment: grades will be in compliance with the XX.

#### Uniform Grade Policy

Letter Grade	Percentage/Points
A	90-100
B	80-89
C	70-79
D	60-69

- *Incompletes:* An incomplete will only be assigned if withdrawal from the course is made after the one-week drop/add period has expired.
- *Special needs:* As required by law, any 504 or IEP modifications and accommodations will be provided.
- *Means of Assessing Student Learning:* Student progress and learning is assessed in a variety of ways. Assessments include discussion participation, model free-response questions, model multiple-choice quizzes, and project grades

## Course Outline and Schedule

Module	Topics	Activities	Assignment Dates
0	Introduction	<ul style="list-style-type: none"> <li>• Introductory Post</li> </ul>	11/29
1	Rubenstein Ch. 4K1.1	<ul style="list-style-type: none"> <li>• Instructional Video</li> <li>• Textual Reading 112-113</li> <li>• Research 4K1 #1-10</li> <li>• TEAMs discussion               <ul style="list-style-type: none"> <li>○ prompt</li> <li>○ hypothesis</li> <li>○ group/self-evaluation</li> </ul> </li> <li>• Schoology commentary               <ul style="list-style-type: none"> <li>○ post</li> <li>○ response</li> </ul> </li> </ul>	11/30
2	Rubenstein Ch. 4K1.2	<ul style="list-style-type: none"> <li>• Lecture cast               <ul style="list-style-type: none"> <li>○ progress checks (2)</li> <li>○ response</li> </ul> </li> <li>• Schoology commentary               <ul style="list-style-type: none"> <li>○ post</li> <li>○ response</li> </ul> </li> <li>• Instructional video</li> <li>• Textual reading 114-115</li> <li>• Research 4K1 #11-21</li> <li>• TEAMs discussion</li> </ul>	12/1

- prompt
  - hypothesis
  - group/self-evaluation
- 3 Rubenstein Ch. 4K1.2-4K2.1
- Digital reading check 12/2
  - Lecture cast
    - progress checks (2)
    - response
  - Schoology commentary
    - post
    - response
  - Instructional video
  - Textual reading 116-117  
Research 4K1 #22-26
  - TEAMs discussion
    - prompt
    - hypothesis
    - group/self-evaluation
- 4 Rubenstein Ch. 4K2.1-4K2.2
- Digital reading check 12/3
  - Lecture cast
    - progress check (1)
    - response
  - Schoology commentary
    - post
    - response
  - Instructional video

- Textual reading 118-119
- Research 4K1 #27-32
- Dataset/map
- TEAMs discussion
  - prompt
  - hypothesis
  - group/self-evaluation

5	Rubenstein Ch. 4K1	<ul style="list-style-type: none"> <li>• TEAMs discussion</li> <li>○ PP creation</li> <li>○ informative presentation</li> <li>• group/self-evaluation</li> </ul>	12/6-12/8
6	Rubenstein Ch. 4K1	<ul style="list-style-type: none"> <li>• Instructional video</li> <li>• Textual reading 120-121</li> <li>• Research 4K1 #33-41</li> <li>• TEAMs discussion</li> <li>○ prompt</li> <li>○ hypothesis</li> <li>• group/self-evaluation</li> </ul>	12/9
7	Rubenstein Ch. 4K2	<ul style="list-style-type: none"> <li>• Digital reading check</li> <li>• Lecture cast</li> <li>○ progress checks (3)</li> <li>○ response</li> <li>• Schoology commentary</li> <li>○ post</li> <li>○ response</li> </ul>	12/10
8	Rubenstein Ch. 4K2	<ul style="list-style-type: none"> <li>• Digital reading check</li> <li>• Lecture cast</li> <li>○ progress check1 (1)</li> <li>○ response</li> <li>• Schoology commentary</li> <li>○ post</li> <li>○ response</li> </ul>	12/11



9	Rubenstein Ch. 4K2.4	<ul style="list-style-type: none"> <li>• Instructional video</li> <li>• Textual reading 122-125</li> <li>• Research 4K2 #1-15</li> <li>• TEAMs discussion <ul style="list-style-type: none"> <li>○ prompt</li> <li>○ hypothesis</li> <li>○ group/self-evaluation</li> </ul> </li> <li>• Lecture cast <ul style="list-style-type: none"> <li>○ progress check1 (1)</li> <li>○ response</li> </ul> </li> <li>• Schoology commentary <ul style="list-style-type: none"> <li>○ post</li> <li>○ response</li> </ul> </li> </ul>	12/13
10	Rubenstein Ch. 4K4.2	<ul style="list-style-type: none"> <li>• Instructional video</li> <li>• Lecture cast <ul style="list-style-type: none"> <li>○ progress checks (3)</li> <li>○ response</li> </ul> </li> <li>• Textual reading 126-131</li> <li>• Research 4K2 #16-33</li> <li>• TEAMs discussion <ul style="list-style-type: none"> <li>○ prompt</li> <li>○ hypothesis</li> <li>○ group/self-evaluation</li> </ul> </li> </ul>	12/14
11	Rubenstein Ch. 4K3.1	<ul style="list-style-type: none"> <li>• Instructional video</li> <li>• Textual reading 132-137</li> </ul>	12/15

		<ul style="list-style-type: none"> <li>• Research 4K3 #1-28</li> <li>• TEAMs discussion               <ul style="list-style-type: none"> <li>○ prompt</li> <li>○ hypothesis</li> <li>○ group/self-evaluation</li> </ul> </li> </ul>	
12	Rubenstein Ch. 4K3	<ul style="list-style-type: none"> <li>• Instructional video</li> <li>• Case study reviews</li> <li>• TEAMs discussion               <ul style="list-style-type: none"> <li>○ prompt</li> <li>○ hypothesis</li> <li>○ group/self-evaluation</li> </ul> </li> </ul>	12/16-17
13	Rubenstein Ch. 4K4	<ul style="list-style-type: none"> <li>• Instructional video</li> <li>• Textual reading 138-141</li> <li>• Research 4K4 #1-23</li> <li>• TEAMs discussion               <ul style="list-style-type: none"> <li>○ prompt</li> <li>○ hypothesis</li> <li>○ group/self-evaluation</li> </ul> </li> <li>• Schoology commentary               <ul style="list-style-type: none"> <li>○ post</li> <li>○ response</li> </ul> </li> </ul>	12/18
14	Rubenstein Ch. 4K1-4	<ul style="list-style-type: none"> <li>• Instructional video</li> <li>• Video analysis: <i>The Lost Boys of Sudan</i> (Mylan &amp; Schenk, 2003)</li> </ul>	12/19

		<ul style="list-style-type: none"> <li>• TEAMs discussion               <ul style="list-style-type: none"> <li>○ prompt</li> <li>○ hypothesis</li> <li>○ group/self-evaluation</li> </ul> </li> <li>• Schoology commentary               <ul style="list-style-type: none"> <li>○ post</li> <li>○ response</li> </ul> </li> </ul>	
15	Rubenstein Ch. 4	<ul style="list-style-type: none"> <li>• Instructional video</li> <li>• Project: culture</li> <li>• TEAMs presentation</li> <li>• Schoology post</li> </ul>	12/20
16	Rubenstein Ch. 4	<ul style="list-style-type: none"> <li>• Assessment               <ul style="list-style-type: none"> <li>○ select responses</li> <li>○ free responses</li> </ul> </li> </ul>	12/21

## APPENDIX M: MODULE 1

- 1 Rubenstein Ch. 4K1.1
- Instructional Video
  - Textual Reading 112-113
  - Research 4K1 #1-10
  - TEAMs discussion
    - prompt
    - hypothesis
    - group/self-evaluation
  - Schoology commentary
    - post
    - response

1. Define: culture-

2. Define: habit-

3. Define: custom –

Introducing Folk and Popular Culture (112-113)

4. Define folk culture –

5. Define: popular culture –

6. Explain the difference between folk and popular culture –

7. Describe the three aspects of cultural location focused on by Geographers –
8. Describe the effects of globalization on pop and folk culture –
9. Explain why pop culture is not sustainable –
10. Describe the two cultural elements discussed in the chapter –

TEAMs Prompt: Discuss examples of why.

## APPENDIX N: MODULE 2

- 2 Rubenstein Ch. 4K1.2
- Lecture cast
    - progress checks (2)
    - response
  - Schoology commentary
    - post
    - response
  - Instructional video
  - Textual reading 114-115
  - Research 4K1 #11-21
  - TEAMs discussion
    - prompt
    - hypothesis
    - group/self-evaluation

### A)Progress Check 1:

- 1.) Briefly explain the #1 purpose of popular music -

2.) Describe when (give a time period) U.S. pop music began to diffuse rapidly –

B) Progress Check 2:

1. Soccer comes from the word: SOCK ASSOCIATION

SOCRERY SOCKET BALL

2. Identify the hearth of soccer-

3. Identify the artist most downloaded in A southeastern U.S. state-

Subsistence and Commercial Culture (310-311)

Origin, Diffusion, and Distribution of Folk and Popular Culture (114-115)

ORIGIN

11. Compare/contrast hearths for folk and pop culture –

12. Identify the origin of hip-hop music –

13. Explain how hip-hop demonstrates both globalization AND local diversity –

14. Explain the two aspects which help pop culture arise –

15. Explain the effects of popular culture on the global labor force –

DIFFUSION

16. Explain how folk culture is usually diffused –

17. Explain how pop culture is diffused –

DISTRIBUTION

18. Describe the distribution of pop culture –

19. Identify the factor in peoples' inability to access pop culture –

20. Explain what factors influence folk culture distribution –

21. Explain why despite spatial proximity, Himalayan peoples have such varied art forms

—

TEAMS Prompt: Create a scenario where an LDC teen would participate in pop culture .



## APPENDIX O: MODULE 3

- 3 Rubenstein Ch. 4K1.3
- Digital reading check
  - Lecture cast
    - progress checks (2)
    - response
  - Schoology commentary
    - post
    - response
  - Instructional video
  - Textual reading 116-117
  - Research 4K1 #22-26
  - TEAMs discussion
    - prompt
    - hypothesis
    - group/self-evaluation

### Progress Check 1:

- 1.) Describe the “typical human.”

- 2.) Identify a country where people consume less than 2500 calories a day Define cereal -

Progress Check 2:

- 1.) Identify the percentage of people lacking food security -
- 2.) Briefly describe the role of meat in MDCs compared to LDCs -

Geographical Differences Between Folk and Popular Culture (116-117)

22. Explain why folk culture has a smaller regional range than pop culture –
23. Describe how folk music used to be locally diverse –
24. Explain why modern pop music is not tied to a specific place –
25. Use FIGURE 4-7 to complete the following actions:
  - a. identify the baseball team you should geographically root for –
  - b. explain why Montana has no obvious favorite team –
  - c. Identify the 3 cities with no majority of fans –
26. Use FIGURE 4-8 to complete the following actions:
  - a. identify the most time-consuming activity among young Pakistanis –
  - b. identify the most time-consuming activity among young Americans –
  - c. compare the amount of time reading between Pakistanis and Americans –

TEAMS Prompt: Describe the role of technology on pop culture in MDCs

## APPENDIX P: MODULE 4

- 4 Rubenstein Ch. 4K1.4
- Digital reading check
  - Lecture cast
    - progress check (1)
    - response
  - Schoology commentary
    - post
    - response
  - Instructional video
  - Textual reading 118-119
  - Research 4K1 #27-32
  - Dataset/map
  - TEAMs discussion
    - prompt
    - hypothesis
    - group/self-evaluation

### Progress Check 1:

1.) Describe the innovation of Whittlesey -

2.) Identify a country practicing folk culture

3.) Define population clusters-

Origin and Diffusion of Folk and Popular Music (118-119)

### FOLK MUSIC

27. Date the invention of music –

28. Explain what shapes the content of folk music –

### POPULAR MUSIC

29. Explain the purpose of pop music –

30. Describe the origins of American pop music –

31. Identify when American music began to diffuse rapidly –

32. Use FIGURE 4-12 to complete the following actions:

a. identify the 3 most popular artists in the U.S. in 2014 –

b. identify the artists most downloaded in A southeastern U.S. state –

c. identify the state that prefers Lorde –

TEAMS Prompt: Explain, with examples, the relationship between climate and culture practice .

## APPENDIX Q: MODULE 5

- 5 Rubenstein Ch. 4K1-4
- TEAMS discussion
    - PP creation
    - informative presentation
    - group/self-evaluation

TEAMS Prompt: Describe the where, what, and why of your culture ty

## APPENDIX R: MODULE 6

- 6 Rubenstein Ch. 4K1.4
- Instructional video
  - Textual reading 120-121
  - Research 4K1 #33-41
  - TEAMS discussion
    - prompt
    - hypothesis
    - group/self-evaluation

Origin and Diffusion of Folk and Popular Sports (120-121)

### FOLK CULTURE: ORIGIN OF SOCCER

33. Date the innovation of Soccer –
34. Describe how soccer originated –

### FOLK CULTURE: DIFFUSION OF SOCCER

35. Describe how time factored into the growth of soccer –
36. Etymologize soccer –
37. Describe how soccer diffused around the world –
38. Use FIGURE 4-13 to complete the following actions:
- a. identify the 5 countries to qualify the most for men's World Cup –

- b. identify the only African country to qualify for women's World Cup 5 or more times -

#### OLYMPIC SPORTS

- 39. List the qualifications for a sport to be in the Olympics –
- 40. List the two American sports not included –

#### SURVIVING FOLK SPORTS

- 41. List the relative locations where each of the sports listed below are popular:
  - a. Cricket –
  - b. Hockey –
  - c. Wushu –
  - d. Baseball –

## APPENDIX S: MODULE 7

- 7 Rubenstein Ch. 9K3
- Digital reading check
  - Lecture cast
    - progress checks (3)
    - response
  - Schoology commentary
    - post
    - response

### Progress Check 1:

- 1.) Identify the two major religious groups who generally do not consume alcoholic beverages-
- 2.) A *bostan* could be found in:                      Boston                      London                      Istanbul  
Tokyo                      Cairo
- 3.) Identify the two MOST common house building materials

Progress Check 2: The city/market is at the outer edge of the cultural realm: T/F

Progress Check 3: The purpose of the model is to show the importance of a person's \_\_\_\_\_ to the realm.

TEAMS Prompt: Describe the role of White's theory in modern culture



## APPENDIX T: MODULE 8

- 8 Rubenstein Ch. 4K1
- Digital reading check
  - Lecture cast
    - progress check (1)
    - response
  - Schoology commentary
    - post
    - response

### Reading Check :

- 1.) Identify whether the types of culture would be found in LDC or MDC or both.
- Amish
  - Animist
  - Matriarchal
  - Male dominant

### Progress Check:

- 1.) Identify the percentage of people reliant on commercial culture
- 2.) Etymologize *culture* -

TEAMS Prompt: Describe the dominant culture in project country (varied)

## APPENDIX U: MODULE 9

- 9 Rubenstein Ch. 4K2.1
- Instructional video
  - Textual reading 122-125
  - Research 4K2 #1-15
  - TEAMs discussion
    - prompt
    - hypothesis
    - group/self-evaluation
  - Lecture cast
    - progress check1 (1)
    - response
  - Schoology commentary
    - post
    - response

### Progress Check 1:

- 1.) Describe assimilation
- 2.) Identify a country where appropriation is a culture hazard -
- 3.) List six characteristics of the Cultural Revolution

Key 2: Where Are Folk and Popular Material Culture Distributed? (122-131)

1. Identify: the three most important necessities for life –
2. Identify the variable which controls access to pop cultural items –

Elements of Material Culture (122-123)

#### WINE GEOGRAPHY

3. Explain the two factors which influence where wine is produced –

WINE PRODUCTION: ENVIRONMENTAL FACTORS

4. Describe terroir –

5. Use FIGURE 4-16 to complete the following actions:

- a. Hypothesize: why is no wine grown in Saudi Arabia –
- b. Hypothesize: why is no wine grown in Sweden –

WINE PRODUCTION: CULTURAL FACTORS

6. Explain why Europeans traditionally drink wine –
7. Identify two religious groups who avoid alcohol –

CONFLICTING FOLK AND POPULAR CULTURAL VALUES

8. Describe folk dress patterns for women in Southwest Asia & North Africa –

Folk and Popular Clothing (124-125)

9. Explain what clothing preferences reflect in pop culture –

FOLK CLOTHING PREFERENCES

10. Exemplify folk clothing meeting environmental circumstances –

11. Identify two other factors which keep folk clothing alive –

RAPID DIFFUSION OF POPULAR CLOTHING STYLES

12. Explain how pop clothing reveals occupation –

13. Explain why high income is necessary to keep current with pop clothing styles –

DEBATE IT! Should Europe accept face covers for women?

14. Choose/prepare to defend the most compelling “prohibit burqa” argument –

15. Choose/prepare to defend the most compelling “permit burqa” argument –

TEAMS Prompt: Explain Huxley’s Theory

## APPENDIX V: MODULE 10

- 10 Rubenstein Ch. 4K4.2
- Instructional video
  - Lecture cast
    - progress checks (3)
    - response
  - Textual reading 126-131
  - Research 4K2 #16-33
  - TEAMs discussion
    - prompt
    - hypothesis
    - group/self-evaluation

### Progress Check 1:

1. Describe the impacts of drought and flooding on culture-
2. Compare assimilation and acculturation-

### Progress Check 2:

3. Define a cultural outlier
4. Briefly describe the outlier controversy

### Progress Check 3:

5. List the 4 positive attributes of folk culture-Folk Food Customs (126-127)

## FOOD AND THE ENVIRONMENT

39. Explain how people adapt their food preferences –

40. Describe a *bostan* –

41. Exemplify a folk food custom –

#### FOOD TABOOS

42. Define a taboo –

43. Explain the origins of some food taboos –

44. Explain why people in the Middle East have pork taboos –

45. Explain why some Hindu people have cattle taboos –

#### Popular Food Preferences (128-129)

#### REGIONAL DIFFERENCES: GLOBAL SCALE

46. Explain why the Québécois prefer Pepsi –

47. Explain why Coke is popular in Russia –

#### REGIONAL DIFFERENCES: U.S. SNACKS AND FAST FOOD

48. Explain why alcohol is unpopular in Utah –

49. Explain why Texans prefer tortilla chips –

#### Folk and Popular Housing (130-131)

#### FOLK HOUSING

#### ENVIRONMENTAL INFLUENCES

50. List potential building materials –

51. List the two most common materials –

52. Explain the purpose of a pitched roof –

#### CULTURAL INFLUENCES

53. Describe the role of religion in housing style –

54. Identify the most auspicious direction to some Buddhists –

#### U.S. FOLK HOUSES

55. Compare U.S. housing pre and post 1940 –

56. Use FIGURE 4-31 to list the three housing hearths in the U.S –

TEAMS Prompt: choose and defend either folk versus pop housing trends–

## APPENDIX W: MODULE 11

- 11 Rubenstein Ch. 4K3.1
- Instructional video
  - Textual reading 132-137
  - Research 4K3 #1-28
  - TEAMs discussion
    - prompt
    - hypothesis
    - group/self-evaluation

Key 3: Why Is Access to Folk and Popular Culture Unequal? (132-137)

1. Explain why pop cultural trends diffuse so rapidly –
2. Identify the largest obstacle to the diffusion of pop culture –  
Diffusion of TV and the Internet (132-133)
3. Identify the world's most important electronic media –  
DISTRIBUTION AND DIFFUSION OF TV
4. Explain the 2 reasons why TV is important -
5. Identify the average number of hours per day of TV an average American watches –
6. Describe the diffusion of TV –
7. Use FIGURE 4-32 to complete the following actions:
  - a. identify the 2 states with the 2<sup>nd</sup> and 3<sup>rd</sup> most TV's in 1954 –



- b. identify the region with the least amount of TV's in 2005 –
- 8. Use TABLE 4-1 to explain why by 2005 the U.S. share of the world's TV's dropped to 16% -

#### DIFFUSION OF THE INTERNET

- 9. Describe the distribution of the internet in 1995 –
- 10. Identify the country with the highest percentage of internet users in 2014 –
- 11. Use TABLE 4-2 to explain why by 2014 the U.S. share of the world's internet users dropped to 10% -
- 12. Use FIGURE 4-33 to complete the following actions:
  - a. identify the 2 countries with the highest internet usage rates in 1995 –
  - b. identify the region in 2014 with the least amount of internet users –

#### Diffusion of Social Media (134-135)

- 13. Identify: the hearth of social media –

#### DIFFUSION OF FACEBOOK

- 14. Identify the specific hearth of Facebook –
- 15. Identify the country with the second highest amount of Facebook users in 2009 –
- 16. Use FIGURE 4-35 to hypothesize why China has so few Facebook users –

#### DIFFUSION OF TWITTER

- 17. List the six (non-U.S.) states in number of tweets in 2014 –
- 18. Use FIGURE 4-37 to identify the top 7 states by twitter users –

#### Challenges in Accessing Electronic Media (136-137)

- 19. Identify the continent with the most limited internet access –
- 20. List the 3 categories of restrictions on free net usage –

## BANNED TECHNOLOGY

21. Describe how governments can ban technology –

## BLOCKED CONTENT

22. List the three leading TV programming leaders –

23. Summarize the three types of “offensive” internet material:

a. political content –

b. social content –

c. security –

24. Explain why Google has been criticized –

## VIOLATED USER RIGHTS

25. Describe how governments violate user rights –

26. Describe how the Gambia and Ethiopia violate rights –

27. List the three worst countries for violating rights –

28. List the two countries suffering the most recent increase in violations –

TEAMS Prompt: Develop a 3-point plan to address censorship –

## APPENDIX X: MODULE 12

- 12            Rubenstein Ch. 4K3            • Instructional video
- Case study reviews
- TEAMs discussion
- hypothesis
- group/self-evaluation

Two Schools of thought developed by two cultural geographers

- Leslie White – (American: University of Michigan)
- Julian Huxley – (British: Oxford)
- Similar ideas about how culture changes and is transmitted to future generations.
- Both believed that culture could be broken down into 3 components. Each component could be carried on to future people in a culture. Similar ideas...both break culture down into 3 basic parts....3 parts of culture...different terminology

Structure: 2 Schools / 3 Parts	
<ul style="list-style-type: none"> <li>• <u>Leslie White</u></li> <li style="padding-left: 20px;">– Ideological Subsystems</li> <li style="padding-left: 20px;">– Technological Subsystems</li> </ul>	<ul style="list-style-type: none"> <li>• <u>Julian Huxley</u></li> <li style="padding-left: 20px;">– Mentifacts</li> <li style="padding-left: 20px;">– Artifacts</li> <li style="padding-left: 20px;">– Sociofacts</li> </ul>

– Sociological Subsystems	
Ideological Subsystems	Mentifacts
Ideas, beliefs & knowledge and the ways these concepts are expressed in speech or other forms of communication	<ul style="list-style-type: none"> <li>– Beliefs, values, mores, folkways, norms</li> <li>– Ideas, concepts</li> </ul>
Examples: Mythology, theology, legend, literature, philosophy, language, and religion.	
Technological Subsystems	Artifacts
<ul style="list-style-type: none"> <li>• Material objects, together with the techniques of their use.</li> <li>• Like tools, games, weapons.</li> </ul>	<ul style="list-style-type: none"> <li>• Material objects, together with the techniques of their use.</li> <li>• Like tools, games, weapons.</li> </ul>
Ex: basketball (ball & game); knife & whittling	
Sociological Subsystems	Sociofacts
Structure of accepted-expected patterns of interpersonal relationships (expected behavior in economic, political, military,	<ul style="list-style-type: none"> <li>• The social organization of culture.</li> <li>• Dictates social behavior.</li> <li>• Structures/relationships</li> </ul>

religious, kinship and other associations.)	
Ex: Family structure; school behaviors; boss-worker relationship; class structure	

TEAMS Prompt: Critique the concept of cultural transmission

## APPENDIX Y: MODULE 13

- 13                      Rubenstein Ch. 4K4.4
- Instructional video
  - Textual reading 138-141
  - Research 4K4 #1-23
  - TEAMs discussion
  - Schoology commentary
    - post
    - response

### Key 4: Why Do Folk & Popular Culture Face Sustainability Challenges? (138-141)

1. Explain what is threatening folk culture –
2. Explain why some fear losing folk culture –

#### Sustainability Challenges for Folk Culture (138-139)

3. Define: assimilation –
4. Define: acculturation –

#### PRESERVING CULTURAL IDENTITY: THE AMISH

5. Describe Amish culture –
6. Describe the diffusion of the Amish –
7. Explain the pull factor for the Amish to relocate to Kentucky –

8. Explain the push factors present in Lancaster, PA –

#### CHALLENGING CULTURAL VALUES: DOWRIES IN INDIA

9. List the positives/negatives that globalization has had on “traditional” women –

10. Describe a dowry –

11. Explain how the dowry system changed –

12. Describe the effectiveness of anti-dowry laws –

13. Describe the current dowry situation in India –

#### Sustainability Challenges for Popular Culture (140-141)

14. List the 2 ways pop culture may impact environmental quality –

#### LANDSCAPE POLLUTION

15. Explain how landscapes can be modified –

#### UNIFORM LANDSCAPES

16. Describe how uniform landscapes are created –

17. Explain the concept of “product recognition” –

#### DEPLETION OF NATURAL RESOURCES

18. Explain how most golf courses are environmentally irresponsible –

19. Explain the effects of pop culture on some animals –

20. Explain why eating beef is inefficient –

#### SUSTAINABILITY & OUR ENVIRONMENT

21. Compare Scottish golf courses with American golf courses –

22. Quantify the percentage of water used by golf courses in Las Vegas –

23. Explain why golf is distant from its folk culture roots –

TEAMS Prompt: Describe how to improve the situation of undowried women –

## APPENDIX Z: MODULE 14

- |    |                     |  |
|----|---------------------|--|
| 14 | Rubenstein Ch. K4.4 | <ul style="list-style-type: none"><li>• Instructional video</li><li>• Video analysis: <i>The Lost Boys of Sudan</i> (Mylan &amp; Schenk, 2003)</li><li>• TEAMs discussion<ul style="list-style-type: none"><li>○ prompt</li><li>○ hypothesis</li><li>○ group/self-evaluation</li></ul></li><li>• Schoology commentary<ul style="list-style-type: none"><li>○ post</li><li>○ response</li></ul></li></ul> |
|----|---------------------|--|

### *Lost Boys of Sudan*

As you watch the film; find and describe how Peter and Santino deal with typical teen experiences in the United States



Event	Example from Movie
Advice from elders	
Traveling	
Associating with friends	
Working	
Making Friends	
High School	

Event	Example from Movie
Diving Test	
Stereotypes	
Leisure activities	
Adapting to a new place	
Time management and pressure	
Disappointment	

TEAMS Prompt: Hypothesize a culture experiment that you may like to conduct

## APPENDIX AA: MODULE 15

- 15            Rubenstein Ch. 4
- Instructional video
  - Project: culture
  - TEAMs presentation
  - Schoology post

Instructions: Students are required to create a portfolio for a selected country throughout the 2021-2022 school year. The portfolio will contain sections representative of each unit of study.

Purpose: The portfolio will serve as a case study application of all the major themes covered in APHG.

Format: The portfolio will be created as PowerPoint. Each section will begin with a cover slide including a photo/illustration/map relating to the unit of study.

Submission: Projects may be turned in via email attachment or Schoology assignment. Improper submission will result in a late grade point deduction

Culminating PowerPoint: At the end of the school year a presentation detailing all 13 sections of the country studied will be delivered to the whole class.

Citation: In text citation is not required for a data compilation. Please include a slide at the end of each section listing websites used to gather data, maps, charts, photos.

Required Content Per Section:

Chapter 4: Culture (due tentatively December 22)

- Identify major applicable folk culture traits: multiple examples of food, clothing, housing, art, music
- Identify major applicable culture traits: examples of mentifacts, artifacts, sociofacts
- Identify and Explain Applicable pop culture present and the effects of globalization
- Identify and Explain Applicable Cultural Hearths: nodes, major urban areas, religious sites, folk regions
- Identify and Explain Applicable Cultural Areas: regions (include an annotated map), realm

Scoring: Each section of the portfolio will be individually scored as a project grade during the unit of study. Please follow directions and deadlines as they are announced in class!

Enjoy! Being an amateur Human Geographer!!

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TEAMS Prompt: Post the completed project to Schoology

## APPENDIX AB: MODULE 16

- 16      Rubenstein Ch. 4
- Assessment
    - select responses
    - free responses

\*see Appendix B