Increasing Biology Content Literacy and Digital Literacy with Minoriy Students Using Blended Learning

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Synopsis:

This autoethnographic paper exposes my experiences, both good and bad, using blended learning to teach biology in 9th grade biology courses in South Texas to increase content and digital literacy of my students and myself. The students in this school district close to Mexico are predominantly Hispanic. The frameworks are social justice and new literacy studies. I obtained the Data from 1) aggregate reports, 2) personal observations, and 3) anonymous feedback from former students. I observed increased digital literacy of my students and myself. Benefits of increasing digital literacy of high school students should have a positive impact on preparing them for higher education.

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Introduction

This autoethnographic report describes my practices using blended learning (BL) for delivering biology content using the online platform www.schoology.com in a South Texas high school near the Mexico border. I describe my challenges and successes in motivating students to increase biology content literacy and personal digital literacy. The research questions of this project were: 1) Will BL improve my students' content literacy? 2) Will BL improve my students' digital literacy? and 3) How is my own digital literacy impacted while using a BL format to teach biology?

Biology content literacy, also called disciplinary literacy, is "literacy practices in science, such as explicitly linking data (evidence) to inferences and conclusions, focusing on multimodal reading, and attending to vocabulary" (Gillis, 2014, p. 614). I measure content literacy in my biology class by assessing a student's ability to use critical thinking to take a learned concept such as the process of photosynthesis, then compare, and contrast it with cellular respiration. It is not enough just to memorize the two reactions. A student should be able to analyze the effect of limiting reactants on the products released from that respective reaction.

Today's students were born with digital devices since birth, but the use of these digital devices in the educational system is still relatively new and underutilized. For example, the use of social media is second nature to a 15-year-old student, while for a 50-year-old man; I found texting annoying and unnecessary for years. Students seem to be able to text while multi-tasking in a variety of other activities painlessly. By using new literacy in the form of modern digital

assets, and making a conscious effort to accommodate students home, cultural and social limitations, BL simultaneously increases students' content literacy and digital literacy. This process will require teachers to continually improve and add new resources provided to students.

Presenting my reflection and memories of my personal lived experiences using BL is appropriate for an autoethnography (Ellis, Adams, & Bochner, 2011). This type of research data helps interested readers focus on useful practices while also avoiding pitfalls. It was also beneficial for me to make sense of the reflected experiences. I will cover my experiences with new digital applications and the effect on the literacy of my students and me.

<p style="text-align:center">**Literature Review**</p>

Blended Learning Defined

Some have defined blended learning as a mixture of face-to-face instruction and computer/technology instruction (Bliuc, Goodyear & Ellis, 2007; Graham, 2006). Broadbent (2017) defined Blended learning as "the adoption of educational web-based technology (e.g., a learning management system) for online learning, which is used in combination with face-to-face, located instruction from teaching practitioners" (p. 25), which is consistent with my definition for this study. BL is hybrid learning which "combines the pedagogy of classroom learning with the suppleness of e-learning" (Patel & Patel, 2017, p, 439). Less common terms are corporate learning and portion learning (Gurevych & Kademiya, 2017).

Blended Learning Impact

Blended learning activities provide students with extracurricular independent work using a learning management system like Schoology; used to create, collect, save and transfer the core content material. BL uses a variety of educational materials, is interactive, self-directed learning with an assessment method that is flexible. This allows for a richer learning environment guided

by teachers that lead student to success (Gurevych & Kademiya, 2017). Teachers take the role of facilitators of student learning by helping them manage time as well as develop and adjust the structure of the course (Aldhafeeri, 2015; Artino & Jones, 2012; Patel & Patel, 2017; Van Doorn & Van Doorn, 2014).

Transitioning from Secondary to Higher Education

Higher education institutes are increasing the number of online courses and degrees. This will require students leaving high school to be more prepared in the educational use of digital technology. Some professors record lectures and post them online for students to view at will. This can be a disadvantage if there is no face-to-face (FTF) time for students to engage in discussions with the professors. Additionally, with the flexibility that allows students to view these same lectures multiple times often comes serious procrastination (Bosshardt & Chiang, 2016). Students need to learn time management in order to reach the highest success with BL.

As students move into higher education, they must be prepared for less face-to-face interactions with instructors, which requires more self-regulated learning (Broadbent, 2017). "The teaching-learning pedagogy must be student centric. Neither in-person nor online pedagogy alone is effective. Blended learning that mixes both in-person and online teaching-learning methodology proves to be significance for higher education for many reasons" (Patel & Patel, 2017, p. 439).

South Texas High School Biology

Motivating students is often challenging for high school biology teachers in South Texas. Getting students engaged in their own literacy growth is one of the major challenges for secondary teachers like myself. As a biology teacher for eleven years in the same South Texas high school, I feel that motivating my students has been crucial to finding success on the State of

Texas Assessments of Academic Readiness (STAAR) End-of-Course (EOC) exam. Over the past couple of years, I have been utilizing an online curriculum that employs the use of a BL strategy in an effort to do just that. Blended learning has been growing in popularity as a means to deliver content to students (Graham, 2006), and is now common practice by higher education institutions worldwide (Masi & Winer, 2005; Sun, Liu, Luo, Wu, & Shit, 2017).

It was my belief that an increase in motivation of students studying the biology content should lead to higher scores on the state EOC exam. Most importantly is that "motivation through talking and advice will not have a transcendental effect if not supported by a good learning system" (Yusoff, Yusoff, & Md Noh, 2017, p. 6). To motivate my students has required me to change my delivery approach and use a more flexible methodology that allows for individualized instruction and more choices for students to select the method of content delivery.

Digital Literacy

Teachers. The online web-based resources available to teachers who use BL in their courses can significantly enhance student participation and involvement, thus ensuring learners participate in their own education and are capable of meaningful discussions during face-to-face lecture (Hilliard, 2015). Throughout this trial, it was necessary to continually build, rebuild, and modify the content and resources provided to the students. As teachers increase their own digital literacy, they will be able to communicate effectively and adapt to student needs. When a teacher offers digital resources, it may require extra attention to the different needs of each class. These may vary not only between classes, but also within classes. To minimize any social injustice that exists, teachers need to know the background and needs of each student. There are socioeconomic, ethnic, cultural, and gender biases that have created a digital divide for many

students that is difficult to close and are of concern for those teachers that are attentive to the Social Justice of their students.

Students. Students who use the internet solely for seeking information are not as successful in education as those who use the internet for a variety of ways, including socialization and other interactive web-based undertakings (Torres-Diaz, Duart, Gomez-Alvarado, Marin-Gutierrez, & Segarra-Faggioni, 2016). Using search engines to look up answers is not as fulfilling or academically successful as compared to using a variety of digital technology together. Bussert-Webb and Henry (2016) found that "children may possess many digital skills, but if these skills involve only entertainment, friendship through social media, and information consumption, these children will not be as academically prepared" (p. 8).

Ritzhaupt, Liu, Dawson, and Barron (2013) looked at mainstream students (white) verses non-mainstream students and male verses female. Significant correlations in digital literacy based on gender, ethnicity, and SES were identified. The highest achieving students were high-SES white females. In 2003, Gorski and Clark identified clear inequalities of access to high-speed Internet access for low SES students outside of school. However, this inequality may be quickly diminishing as indicated by the more recent studies that found Latinos access the internet just as much others (Lopez, Gonzalez-Barrera, & Patten, 2013). The more prevalent issues now are devices that malfunction, have unreliable Internet access, and issues with finding suitable and accessible public access when home access is unavailable (Gonzales, 2016).

Prieger (2015) reported that whites (the mainstream) have significantly better and more frequent access to high speed broadband Internet than minorities do. Currently, access to high quality smart phones to be the main factor limiting digital access of non-mainstream students (Park and Lee, 2015). Bussert-Webb and Henry (2016) found that due to difficulties with access

to the Internet, teachers may "hesitate to assign digital work" (p. 9), but this is not acceptable. It is clear that digital literacy varies dramatically from student to student and is perhaps one of the greatest limiting factors to success in courses utilizing BL with technology. Only by identifying areas of low digital literacy, and minimizing effects of primary, secondary, and tertiary divides, will proper support be able to help the low-performing students bridge the gap.

Procrastination

Most people procrastinate at one time or another. I am often guilty of it myself. "Many studies find that academic procrastination is negatively related to academic performance" (Rotenstein, Davis & Tatum, 2009, p. 224). Academic procrastination is significant since it can directly affect grades and future employment opportunities. A limited amount of procrastination by itself may not be a major problem; however, the level of procrastination is an important factor that affects student completion rates in self-paced courses (Lim, 2016, p. 174).

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Theoretical Framework

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The theoretical frameworks of this study are Social Justice (SJ) and New Literacies Studies (NLS). These two frameworks used together by Bussert-Webb & Diaz (2012) built off the premise that fundamental inequalities exist with new literacies. Philosophers first accepted social justice after the publication of John Rawls book, *A Theory of Justice* (1973). Rawls' description of SJ has been a focal point in philosophy for many years; however, there are additional interpretations of SJ today. A major challenge for education has been "inequitable distribution of resources in the struggle for social justice" (Eppley, 2017, p 51).

Social injustices diminish performance of students learning new content when using new technologies. NLS view literacy as something people already use in society and have argued "that literacy was not primarily a mental phenomenon, but rather a sociocultural one" (Gee,

2010, p. 17). The BL format of teaching biology used with the www.Schoology.com platform as a means to introduce biology students to the content put forth in the Texas Essential Knowledge and Skills (TEKS) (Texas Education Agency, 2012) is the new literacy in this paper. Internet use in school framed as a new literacy issue rather than simply a technology issue is appropriate. Also of importance are teacher's responsibilities, teacher communication, and students' communication skills (Leu, O'Byrne, Zawilinski, McVerry, & Everett-Cacopardo, 2009).

Data Sources

The data used in this autoethnography comes from three sources: 1) District Tango Trends summative reports, 2) personal observations, and 3) anonymous feedback from students who already completed the course. Aggregate Tango data collected from archived course records from 2016 helped demonstrate success with BL. Personal observations shared in this report are guides for other teachers to consider.

Tango Aggregate Reports

The school districts Tango data summarizes EOC scores by gender; ethnicity; and program funding which includes at risk, limited English proficiency (LEP), English as a second language (ESL), migrant status and more. The data is public information, is obtainable from the Texas Education Agency (TEA), and in this case accessed via district provided Tango Trends (2017) software. Tango displays results of the EOC including average scores (%), passing rates (%), and advanced scores (%). The exact format of displayed data has changed from year to year, but the overall appearance of the data has been relatively the same.

Personal Notes

A self-reflective personal summary annotates observed student struggles and successes. My recorded observations and reflections were kept using Microsoft Word. These notes included

my experiences that were both successful and challenging to me. I adjusted the content sequence and delivery, as well as digital resources used during the courses as needed by the individual classes. The reflection notes for Spring 2016 were made at the conclusion of the course with BL, whereas the notes for Fall were made throughout the course as observations were made.

Student Feedback

I decided to add three short essay responses to my final exams that related to the students' experiences with the BL format. It was new to them and me, so I wanted to get immediate feedback in the hopes to make improvements for the following school year. I have included these prompts in all of the courses I have taught since then. The open-ended responses analyzed for word frequency and ranked according to how common they were with all student responses.

Methods

Setting

My experience with BL took place in a high school near the U.S./Mexican border in a historically rural school district. The primary town consists of predominantly farmland, with a population of less than 7,000 in 2015. The median home is valued at just over $89,000. The population has 35% of its residents under 18, and is composed of 88.2% Hispanic/Latino. Small portions of the surrounding cities are part of the school district. They are composed of similar ethnic ratios, but have larger populations of approximately 184,000, and 25,000 (U.S. Census Bureau, 2017). The school district in this small cluster of towns/cities has just over 10,000 children and adolescents enrolled.

The campus where I teach biology has about 1,800 students. I currently teach four periods each day, three 90 minute classes and a forth class for 45 minutes. My first attempt using BL occurred cautiously with only one 90-minute period of 28 PreAP biology students during the

spring semester of 2016. That fall semester, I used a modified version of what I had in the first PreAP class, with three additional cohorts totaling 64 students, divided into three 90-minute PreAP classes. I have since used this format for all of my classes I teach, both PreAP and regular biology. Each semester I made slight modifications to suit the needs of each unique class.

Participants

Teacher. I am 52 year-old male born and raised in the United States. I am brown-skinned and many of my Hispanic students assume I am of Mexican decent and often try speaking to me in Spanish, but I am not proficient in Spanish. When I first taught biology in 2006, I had already invested 14 years in various positions as a marine biologist in Texas, Hawaii, and Puerto Rico. Although I had no formal training as an educator, I obtained an emergency teaching certificate in Texas because I had a Master's of Science degree and over a decade of experience working in science. I received my full teaching credentials within the first year of being in a biology classroom and have been teaching in the same district now for 11 years.

In the spring semester of 2015 our campus principal discussed with our biology department the need to increase our advanced scores (raw student score ≥83%) on the Biology EOC exam. Despite my intense efforts prior to the challenge, my PreAP students historically averaged between 18-19% reaching or exceeding the 83% mark, and non-PreAP about half that, but our principal challenged us to get the PreAP students to 30% or above. She believed this to be enough to carry our campus to the highest level for school ratings in Texas, five stars. Biology prevented out district from getting this fifth star for several years in a row.

I felt this was an impossible task. I had always strived to get as many students to the advanced level as possible. I witnessed a lack of motivation by students and noted this to administration several times, asking for ideas on how to motivate them. Many of the PreAP

students seemed concerned about reaching the minimal level of passing, not advanced. Shortly after this challenge, another teacher introduced a teaching technique that was new to me, blended learning and to the Internet platform (www.schoology.com). I decided to try this new method with the hopes that students might be more motivated with the use of technology.

Students. The participants in this study were 14 to 16 year-old high school biology students. I did not use any current students for data collection. Students are not identifiable from the data. Table 1 provides the demographics.

Table 1. Student demographics.

Category	Sub Group	Percent (%)
Gender	Male	22
	Female	78
Ethnicity	Hispanic	99
	White (non-Hispanic)	1
Program Funding	Title 1	100
	Economically Disadvantaged	62
	At Risk	4
	Limited English Proficiency	0
	Special Education	0
	English as a Second Language	0

Procedures

First BL Course Taught Spring 2016. After committing to give a full effort to utilizing the Schoology website to offer my biology curriculum, I spent many hours of my Christmas vacation 2015 searching the internet and my existing files on my computer hard drive. I used short videos, online lab activities, readings, online games, current events and anything else I stumbled across that supported my students' content literacy to a level that would empower them to use higher order thinking skills to excel on the EOC. I previewed and evaluated each item for its quality and accuracy. I rejected a large number of potential resources due to inadequacies in one way or another.

After uploading enough resources to Schoology to cover the first 9 weeks of the course, I began to organize all those resources into folders on Schoology by content categories corresponding to the district's timeline for the course. I continued the same search, evaluate, upload, and grouping sequence throughout the first nine weeks of school to complete the final nine weeks of assignments. Eventually I had all of my resources uploaded and grouped into the Schoology *Personal Resources* folder. I asked for and listened to student feedback about the resources I originally provided and replaced files that the students found less interesting or useful throughout the semester. I eventually offered students extra credit if they found resources that were better than the ones I had provided for them. Students voted two videos better than the videos I already had on Schoology.

I wanted to add a self-paced feature to my BL course and was pleased to discover that Schoology allowed me to set the order a student would gain access to each resource. Prior to the onset of the first nine weeks, I setup a sequence that would allow students to proceed through the lesson folders at an individualized pace. I explained to students that if they chose to, they could finish the entire course at their own pace. They simply had to complete the online assignments, take the online quizzes, and then upon request I would provide them an in-school exam over each content area. In order to offer this self-paced feature, and still follow district guidelines for report cards, I set the due date for a minimal number of assignments the week prior to the first report card. I created this list of work in order to have at least the 15 daily grades and 5 major grades required by University Interscholastic League (UIL) and district guidelines.

Complicating the use of BL was the fact that not all my students had equitable digital access and skills. Bussert-Webb & Henry (2016) suggested moving beyond a primary digital divide of access, and the secondary divide of use, a tertiary divide exists. This tertiary divide

pertains to digital skills (Bussert-Webb & Henry, 2016, p. 29). To help reduce the social

injustice, during the first few days of class I demonstrated how to navigate Schoology, provided

a class set of laptop computers, and ensured Wi-Fi access for all students in class.

Many students did not know their district provided passwords to login to the WiFi, so I

took the classes to the campus library to get assistance from the librarian first. I walked students

through all aspects of Schoology and the online textbook with the website's additional resources

in English and Spanish. Some students required one-on-one help. The Schoology platform allows

access to the resources and assignments from any device, but I found some students did not have

access to high-speed internet outside of school. I experienced exactly what Bussert-Webb and

Henry (2016) described as the tertiary digital divide.

My daily classroom activities included short lectures or hands-on activities that lasted 20

to 40 minutes maximum. At the conclusion of the Face-to-Face (FTF) instructional time, the

remaining time was for students' internet access to Schoology. Students worked either

individually or in small groups. The brought their own headsets to minimize noise. I asked

students to notify me if they did not have headsets so that I could check some out from our

library for them, but no students ever asked for any.

I gave all students the option to either listen to my lectures, participate in the hands-on

activities, or go directly to working on Schoology. About half of the students regularly chose to

start using the online resources immediately at the start of class and skipped any other activities

we were doing. Ultimately, this was an advantage because it turned my FTF lecture into a much

smaller group and allowed me to interact and respond to student misconceptions quickly.

I asked students at the conclusion of courses to respond to three prompts about their experiences

as part of their final exam on a separate piece of paper. I cut off any identifying marks such as

name and period and disposed of the removed portions after completing the grading. The papers with students' responses have since been scrambled and set aside in a locked file cabinet secured at school. I analyzed the responses to the prompts for word frequency. The open-ended short-answer prompts were as follows:

 1) Pick one or two aspects about blended learning that you found to be an advantage as you studied biology.

2) Pick one or two aspects about blended learning that you found to be most difficult.

3) What suggestions do you have to make this class better?

Prior to any analysis with the student feedback, I scrambled the papers from all courses and numbered them at the top of each page for dictation and citation purposes only. The responses were not identifiable with any particular student, class period, or semester taught. I read each paper aloud for dictation using a phone application (Notepad) and then emailed the Notepad file to my Gmail account. Next, I copied the dictated text and pasted it into Microsoft Word. I then checked for any dictation errors using the original responses and the random identification numbers assigned. I then used www.wordle.net to identify the most commonly used vocabulary by the students. Ultimately, I conducted a word count in Microsoft Word to find the exact frequency of those common words for final analysis.

Courses taught Fall of 2016. I taught all classes during this period using most of the same resources of the PreAP class from the spring semester. I had seen some procrastination by students in the spring, but at a much lower level than the Fall semester. Thus, I used due dates that required all students to complete unit assignments by 11:59 PM the night before the unit exam. Unit exams were every 6 to 10 days, depending on the complexity of the content within

the unit. I gave students the option to work ahead if they desired to do so. Only a couple of students worked ahead regularly.

I adjusted the resources on Schoology, as suggested by student responses to the final exam prompts. This included not having too many videos that lasted more than 5 to 7 minutes, more hands-on activities, and for some more FTF lecture time. Since lecture-time was optional it seemed appropriate to offer more, but that also cut down my ability to monitor other student's activities. I continue to make modifications, update videos, and search for more videos offered in Spanish for my ESL and LEP students.

Data Analysis

The *Constant Comparison Method* was first developed by Barney Glaser in 1965 and Glaser and Anselm Strauss in 1967. It is now known as grounded theory (GT). "From its beginnings in health, the grounded theory method has come to prominence in fields as diverse as drama, management, manufacturing and education" (Fletcher-Watson, 2013). The strategy of GT is the interrelationship found between the perception of the subjects and the actions taken by them during the experiences (Aldibat & Le Lavenec, 2001; Glaser, 1992). GT starts with the researcher taking the first data collected and then continuously comparing it to indicators, concepts and categories within the study (Glaser, 1965).

GT is the use of coding of key words in ethnographic studies, and thus would be appropriate for analysis of the data in this autoethnography. The source data "provides the material from which codes are extracted, which is often largely based on observer notes, log, diaries, etc." (Glaser & Strauss, 1967). The codes allow for gathering of the key points in the data. Concepts develop by the grouping of similar codes. Finally, a collection of categories leads to a theory.

In this study, I worked at the first step of GT, which involved identifying codes. Using GT does not require the researcher to start with a formulated hypothesis, which I did not have. I based my original theme on my previous experiences with using technology in the classroom. I also knew some students would have difficulty completing assignments outside of class, so I would have to provide alternative options for these students. I just was not sure how to mix digital literacy and content literacy, and avoid social injustices while doing so. I compared the coded data from the student prompts with my own summary notes about the course, as well as collecting EOC data regarding improvement in average scores and advanced scores on the EOC exams.

Findings

Tango data, personal observations and student responses to prompts identified several themes. Teacher and student digital literacy was improved. Student content literacy increased with BL, but student procrastination is one of the biggest setbacks to BL in a self-paced environment. I found mixed acceptance of BL by the students, but most preferred it to traditional FTF lectures.

Digital Literacy Improvement

Teacher. BL and Schoology required a lot of extra work for me before implementation, during use, and at the conclusion of teaching my biology courses. I found that with the extra work to get BL started and making constant improvements, I observed a notable increase in my digital literacy. It no longer took me excessive time to locate and download resources online, especially videos. I located and downloaded multiple resources at the same time by multitasking internet resources. I found an amazing amount of high quality, often HD, biology videos online. I created a *question bank* on Schoology with questions that I used for online quizzes and unit tests.

I organized the questions by content are into subfolders. Reorganizing may never end as more resources become available.

I have since mentored other teachers interested in similar digital activities, presented at a regional conference and a national curriculum conference. My confidence level is very high at this point, however I still know there is a lot of room for growth. I have experienced an empowering increase in my confidence and it is reflective of my increased digital literacy.

Students. I was surprised that many of the students were not as technologically savvy as I thought they were at the start of the courses with BL. The first few weeks of each course have required me to spend a lot more time than I anticipated helping students' setup accounts, navigate the online textbook and Schoology, and organizing their personal resources. A theme that became evident was that students were not capable of figuring out how to use the educational resources to their advantage without guidance. I intervened to help them get and keep on track.

By the end of the course, students were skilled at using not only Schoology, but were capable of creating and uploading editable documents, creating and uploading their own videos, evaluating resources online that were not specifically identified for them, and collaborating on projects. Most students no longer relied on me for guidance as to where to go to find specific resources. They were working independent of significant teacher inputs and working in groups effectively. There was improvement in cooperative efforts with student-student tutoring happening in class.

Student Content Literacy

Blended learning positively influenced my students' average scores on the biology EOC exam and the percent of students reaching the advanced level. Students' aggregate scores in my

PreAP biology classes using BL scored impressively higher on the Biology EOC than in my previous years when I had not used it. This is evidence of an increase in content literacy. However, advanced scores were much higher in the spring 2016 administration of the test than they were in the fall of 2016.

There were 97% of the students that passed the spring EOC exam and 76.4% of those students scored at an advanced level (≥83%). The next semester 98.45% passed, but only 32.8% reached advanced. Fluctuations in performance scores are expected, but the significantly lower scores in the fall were disappointing. Even though the advanced percentage was lower in the fall, there was still significant progress made and the average test score increased from a 67.2% to a 77.7%. Additionally, the greatest difference in the student passing performance on the EOC was between males and females (-2.9%) and not what I had anticipated. Ethnic differences between whites and Hispanics was (-1.6%). White male students performed at the highest level, with a 100% passing rate.

Student Feedback

The most common theme I read in student open-ended responses related to having more time to learn. Twenty-one students referenced the word "time" and wrote that they felt they had more time with BL. Students used the word "Home" 17 times, pace 16, class 15, and understand on 12 occasions. "One aspect that helped me a lot is that the blended learning allowed me to research and find out things for myself and helped me remember things more easily because I did it on my own" (Anonymous student, 2016). Another comment I found encouraging was "I think one aspect that I found to my advantage was that it was a self-learning and you can go at your own pace. It was very convenient for slower people like me." I used constructive criticism provided by some students in the courses to make improvements." Another student wrote: "I

believe that giving more lectures would make this class better. I feel some kids learn more from their teacher." I have made an effort to add more face-to-face lecture time, but still allow adequate time during class for online access. FTF lectures are optional for the students.

Discussion

My biggest concerns at the start were two-fold: First, was I technologically savvy enough to pull this off with students that I knew in many ways were more advanced in their digital literacy than I was. Second, would the students be willing participants in their own digital and content literacy advancements? I was reasonably confident that BL could be successful. "BL is a good alternative to classroom instructions (traditional face-to-face) and demonstrates a larger effect size on student performance" (Vo, Zhu & Diep, 2017, p. 24).

There was an observed increase in content and digital literacy of my students, as well as an improvement in my own digital literacy. However, the success of the first trial was more successful. Perhaps the proficiency of the students was different? Yusoff, Yusoff, & Md Noh (2017) stated "even though an average proficient student can quickly familiarize and adapt to blended learning approach, less than average proficient students need to have additional monitoring to encourage higher participation" (p. 6). Maybe I needed to monitor more for some students than I realized.

Finally, there is no doubt that blended learning is becoming more and more prevalent in higher education. Secondary students need to exposure to formats such as blended learning in order to be better prepared for college demands. "Nowadays, blended learning is a must. If students cannot learn the way we teach them, then as instructors, we must find ways to change our teaching method" (Yusoff, Yusoff, & Md Noh, 2017, p. 6).

Limitations

One limitation of this study is indicative of autoethnographies and is associated with the fact that during the first semester I did not take detailed notes until the semester was over. And as Ellis, Adams, & Bochner (2011) clearly stated; "We know that memory is fallible, that it is impossible to recall or report on events in language that exactly represents how those events were lived and felt" (p. 7). Although I did my best to recount events as they occurred and with as much detail as possible, there is no doubt that I have forgotten some important factors that might have occurred.

A second limitation may be a negative influence of BL on content literacy for some students, and thus EOC scores, due to behavioral issues, which can sometimes negatively influence the atmosphere of a specific class or group of students. There were no records kept related to students' behaviors during the early courses with this study. Group effects on some students who may have performed differently in an alternative class setting may have influenced results on the EOC scores.

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