Qualitative Proposal – Instagram & STEM Engagement

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Introduction

The United States has fallen back as a global educational leader in science, technology, engineering, and math (STEM) over the years. An important benchmark for measuring STEM proficiency in the United States and around the world is the Programme for International Student Assessment (PISA). From the PISA 2015 results, the United States ranked 38 out of 71 countries in math and 24th in science (PISA, 2015). To improve our global competitiveness in these fields, government and educators need to launch campaigns to bring STEM awareness and increase student engagement. To leverage social media platforms is one avenue to drive excitement in STEM education and careers.

Statement of the Problem

The job market in the STEM field is increasing faster than the rest of the job opportunities of the economy. As a result, projected by 2025, the U.S. faces a projected deficit of qualified advanced-degree STEM professionals to fill the available openings (Radu, 2018). To keep up with the future demand and to be an active participant, the United States needs to close the gap between the knowledge and skills needed in STEM. Higher education needs to build a community to bring awareness of STEM activities to the undergraduate students and to keep them engaged in STEM education.

Need and value

STEM entry-level job description had high educational requirements. Well over 90 percent of STEM employment requires some form of postsecondary education for consideration, compared with 30 percent of other types of entry-level jobs (Fayer, Lacey, & Watson, 2015). There is an increased need for higher education to do better engagement with students with an

undecided college major to be interested in a STEM career path. Many universities continue to use traditional approaches to recruit students, but the overall failure is graduating students are diverting to non-related STEM careers after graduation. The demand for students interested in continuing to pursue a STEM career continues to struggle to fill the many vacant spots that are increasingly available. Yet, the number of students pursuing a STEM career is not keeping pace with the demand. Researchers need to evaluate the pressing issue and to come with recommendations on how to mitigate the shortfall. This constructivist ground theory study contributes to the knowledge repository to meeting the urgent call to reverse the trend of students not pursuing a STEM career. The study provides a better understanding of Instagram engagement and higher education STEM course context.

Research Questions

1. How do undergraduate students at an urban private university use Instagram to engage with STEM courses?

      a. What are the factors perceived by the students as having influences on their digital social media use?

2. What are the experiences of undergraduate students when using Instagram with their STEM courses?

Literature Review

Higher education has a daunting task to get students interested in a STEM career. The changing student demographics push the university to find ways to get students engaged. Students are spending a significant of their time online and on the social media platform. Higher education needs to leverage the social media platform to increase interest in a STEM career as a way to reduce the shortfall of qualified STEM joining the workforce. The researcher will evaluate social learning theory and how it plays a critical role in getting undergraduate students to increase engagement in STEM courses through social media in a university setting. Instagram is a popular social media platform used by undergraduate students.

Social Learning Theory

Social learning theory states that cognitive learning takes place in a social context and obtains from observations of others through social interactions and experiences (Bandura, 1977). For this study, these social interactions and experiences captured through Instagram. The researcher reviewed the interactions and experiences of undergraduate students and how they perceive social media as a pedagogical tool.

Socially Shared Cognition

The principle of socially shared cognition requires active student engagement in learning, whereby students share their knowledge within the learning community. Socially shared cognition is a result of the concerned parties taking an active role in participation to enhance learning outcomes (Moreland, Argote, & Krishnan,1996).

Communities of Practice

The engagement with other students within a STEM course on completing a class project, working together with solutions to challenges, or interacting with external organizations to assist students in finding placement in the community. Students who come together because of similar interests and have the medium to share their knowledge and to gain a better understanding of other views.

The use of social media in undergraduate STEM courses offers opportunities for the group of students to have a community to rely on and to provide mental and physical support for each other as they are finishing off their course works. This social interaction with peers fosters an environment where students motivated to learn new concepts continuously. (Lave & Wenger, 1991).

Graduate's Students Perception of Social Media and Course Work

Past studies have provided a connection with the use of social media with an overall improvement in academics. For this study, the researcher interested in finding out how to use the role of social media as a learning tool to support academic engagement and collaboration with the graduate coursework (Holiday Udeh, 2019). College students are adopting the social media platform as a new way to communicate with each other. Higher education educators need to leverage the social media platform to connect more academically fluid with their students, who are frequently on these platforms.

The Impact of Social Media Communication on Career Goals, Sense of Belonging, and

Grades

This mixed-methods study explores the use of Slack, impacted career goals, sense of belonging, and student GPA after their first semester (Eller, 2019). The results did find that rejection and exclusion, in terms of one's sense of belonging, correlated, and predicted course grades at the end of the semester. Also, qualitative results found that students who built connections with their peers where active participation on campus,

Role of Social Media and Higher Education

The research highlights the use of social media for collaborative learning and engagement. The findings showed that cooperative learning, meeting through the use of social media relates to the interactivity of research participants. Also, using social media for educational purposes can be beneficial for student learning in multiple ways. First, social media enhances peer interactions, which can bridge diversity in the classroom and establish open lines of communication between students and educators (Liu, 2010). Furthermore, a positive correlation found between Twitter usage and student engagement in university activities by sharing information through media platforms (Evan, 2014). This study proposes a framework for the impact of social media use on collaborative learning based on the constructivism theory (Vygotsky, 1978).

Besides, engaging with social media as a higher education marketing tool is an attractive proposition, because of the positive business experience on the effects of social media marketing and the high adoption rate of social media by the younger generation (Boyd, 2008). Improved communications, customer engagement, and increasing brand loyalty identified as outcomes of

this form of marketing. It is reasonable to assume that participation of social media applications as part of university marketing could contribute to increased enrolment numbers and help prospective four students make better-informed decisions regarding their study choice and university selection. However, little known about how future university students use social media and what impact social media have on the decision making the process of prospective students regarding their choice for a study and university.

Visual learners craving digital content, and educators have the opportunity to utilize a plethora of new technologies to increase student engagement. The social media platform is popular because of the seamless flow of information they have created (Evans, Won, & Drape, 2014). It effortlessly connects people with like-minds and interests.

The social nature of the internet has created an environment of learning, and participation in community forums about such open-source software and hardware empowers students to learn and develop confidence in their skills, through relevant, real-world projects. Social sites are used to share discoveries and new skills around open-source software and hardware used in STEM fields.

Social networking sites, in particular, examined through many different lenses, for example, explored as a tool to enhance learner understanding, a support technology for incorporation into current pedagogy, or as a natural extension of the learning environment (Merchant, 2012). A growing number of universities now offer online courses, distance learning technologies, mobile learning applications. Such offerings challenge educators to rethink the traditional parameters of time and place related to when and where learning occurs.

For this research study, we need to find new ways of getting young people more interested in STEM, which aims at increasing the attractiveness of STEM education and careers among undergraduate students.

Methodology

This study looks at the process and the social media application, so I chose constructivist grounded theory as an excellent methodological fit for the research. Charmaz (2006) explained that grounded theory methods consist of systematic and guidelines for collecting and analyzing qualitative data to construct theories grounded in the data themselves. Charmaz (2006) expressed that grounded theorists collect data to develop theoretical analyses from the beginning of the research, and this is where I reference the literature to create the conceptual framework for this study. The researcher seeks to understand the nature in which undergraduate STEM students engage in active learning, motivated to learn, and to participate in social interactions through Instagram by referencing student interviews (Patton, 2015). How did students' use of social media impact engagement with STEM courses? The theoretical framework of constructionism through active learning, the development of motivation, and the support through the creation of a community of practice (Creswell & Creswell, 2018).

The process of the constructivist grounded theory, according to Charmaz (2006), requires grounded theorists to study the early data as it is being collected and begin to separate, sort, and synthesize these data through qualitative coding.

Population/sample/sampling

Participants included undergraduate students who enrolled in STEM courses, and their instructors were using Instagram as a medium of social communication. Also, participants self-reported their enrollment status and social media usage status.

According to Charmaz (2006), theoretical sampling develops category until no new ones emerge, whereas saturation achieved. Charmaz (2006) writes that when using constructivist grounded theory, the initial sampling addresses the research question, and theoretical sampling directs you where to go. The purpose of theoretical sampling is to obtain data to help clarify your categories. Grounded theorists aim to fit their emerging theories with their data (Charmaz, 2006). I contact possible participants by posting the flyer on the student center bulletin. Interested parties were encouraged to contact me, the principal investigator, for detailed information. All willing participants were allowed to ask any questions regarding the study and informed that they could choose to discontinue participation whenever. The recruitment process remains in the guidelines set by the NJCU Institutional Review Board (IRB).

Data Source

The data were the interviews conducted with participants who fit the criteria and agreed to be a participant. The study included 25 participants (Creswell & Creswell, 2018) who were asked to have a one-to-one semi-structured interview with the researcher. The meeting was approximately one hour in length. Triangulation ensures through multiple sources of data collection include interviews and document analysis (Creswell & Creswell, 2018).

Procedures

1. To accomplish this, I will first reach out to the study site to request permission for usage.

2. After receiving permission, I would coordinate with the IRB of New Jersey City University to secure the appropriate rights to perform the study.

3. Data collection consisted of one-on-one interviews with each participant. Seven interview Questions (Appendix A).The discussions were semi-structured interviews conducted in a format that was the most convenient for the participant. All participants chose to participate in phone interviews. The audio from the participant interviews was reordered on a digital recorder and transcribed by me.

4. The data coding and analysis were done through MAXQDA, qualitative coding software (VERBI GmbH, 2019). Emerging themes and subthemes organized, color-coded, and coding was presented in visual representation to improve fluency in the peer debriefing process. The audio recordings and transcriptions were saved and stored on my password-protected university Microsoft Office SharePoint drive.

5. Coding the data included at least two phases according to constructivist grounded theory (Charmaz, 2006). Initial coding is the first phase of data coding analysis during initial coding fragments of the data studied to uncover analytic importance (Charmaz, 2006). I review quickly through the interviews and highlighted those words or phrases that sparked interest.

6. During the second phase of coding, known as focused coding, the useful initial codes were selected to extensively test them against the data (Charmaz, 2006). During focused coding, I verified initial codes by taking the primary codes that emerged then compared and contrasted those across all data sets to see if those codes represented across data sets.

Equipment

Equipment needed for the study including audio digital recorder, phone connection for the phone interview, and the qualitative coding software MAXQDA.

Potential risks

A few potential risks involved in this study are: (a) researcher bias; (b) time allotment; (c) absenteeism which would skew the data collection; (d) equipment issues; (e) delayed IRB approval; and (f) participants opt-out during the study.

Proposed Timeline.

Task	Timeframe
Complete Dissertation Committee Form	**Feb 2020**
Discuss topics and methodology with Dissertation Chair	**April 2020**
Write Dissertation Proposal Chapters 1 Introduction Chapter 2 Literature Review Chapter 3 Methods	**May 2020 - June 2020**
Defend Dissertation Proposal	**July 2020**
Complete IRB	**Sep 2020**
Collect Data	**Oct 2020 - Nov 2020**
Work with Dissertation Chair on Chapter 4 Findings Chapter 5 Discussion	**Nov 2020 - Dec 2020**
Submit the dissertation	**Mar 2021**
Defenses Scheduled	**Mid Mar 2021**

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Appendix A

Interview Questions

1. How do you feel about Instagram?

2. How do you feel about STEM courses?

3. How do you feel about Instagram as a social medium of communication?

4. What are your thoughts on ways to get engaged in STEM?

5. What do you think about STEM courses and Instagram?

6. How do you feel using Instagram to communicate with your instructor?

7. What are your thoughts on ways to enhance STEM engagement?