International Journal of Innovation and Research in Educational Sciences
Volume 3, Issue 4, ISSN (Online): 2349–5219

Using Social Media and Gamification to Measure Engagement with Study Abroad Programs

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***Abstract* – Social media has become increasingly available and is used by millions of people who have near constant access all over the world. It provides a platform for people in disparate geographical locations to connect and share their lives. Users are able to view and engage with experiences from remote places, gaining knowledge and insights they may never have had were not for this sustained connection. This paper describes a game that was run through Facebook, this was created to analyze the interpretation of culture between participants in different countries and encourage international interaction between students from the U.S.A. and India. A total of fifteen students from the State University of New York (SUNY) in the U.S.A. and sixteen from the Tripura Institute of Technology (TIT) in India participated in the game. For 30 days, participants uploaded pictures of "culture", whatever their interpretation of that word may be, to a Facebook group. Points were awarded for posting photos and commenting on others photos. Players were able to steal points by mimicking a photo from another player, providing some friendly competition and excitement to the game. This paper reports on the measures that were taken to analyze increases in interest in other cultures among the participants and reports on the findings regarding the game mechanics and the use of a gamification strategy to increase engagement.**

***Keywords* – Social Media, Gamification, Study Abroad, Facebook, Education.**

I. INTRODUCTION

The size of the Internet and its increasing accessibility around the world, means that members of every nation on earth can now be connected virtually by technology. Research has shown that in western society, much of what an individual experiences about other cities, countries, and cultures comes from social media [1]. Social media can immerse a user, allowing them to view information through another person's perspective or perhaps gain some experience of different spatial and physical locations. Users in differing geographic areas are able to share parts of their lives through text updates, photos, and videos. Social media applications and websites are more than a means to connect with friends, they are also a method for virtually experiencing a world of information that may be otherwise inaccessible.

Locative media, a term coined by Karlis Kalnins in 2004, is defined by Hamilton [2] as "A new field of interactive media centered on the geographical context". Recent integrations of geo-technology into social media applications have allowed for users to interact on a spatial level, although they are in different locations physically. This allows for viewers of photos, tweets, and virtual maps to have their experiences attached to a specific geographic location. This convergence of spatial locations allows for geographically contextual content to be shared between users, enhancing the level of contextual understanding between users. Moreover, the very definition of "place" now becomes more ambiguous and subjective. While a physical body may be in a certain geographical area, a user can easily be transported virtually to a new, remote, geographic environment. The question of what defines a user's presence, and their level of immersion, within an environment become important. Presence in a place no longer depends on where feet touch the soil, it is more about forming connections with environments and the individuals that occupy them, physically or virtually [3].

II. LITERATURE REVIEW

Definitions of the term "culture" can be subjective. The definition can often depend on the culture itself within the individual is immersed in and their own general perceptions. However, a working definition that can be used is "The language, values, beliefs, traditions, and customs people share and learn" [1].

Social networks involve users connecting to other users on a larger, international scale. These networks provide an outlet for users to gain experiences in multiple geographical locations different from their own. People are able to view aspects of other cultures and obtain first-hand opinions and cultural perceptions of these via video, photographic and text postings on different social media sites (such as Twitter, Snapchat, and Facebook). Before the rapid expansion of the Internet, people often had limited ability to physically travel to see and learn things about other cultures and spaces, places they can now visit virtually. Currently, the Internet now provides an ability for people to access a seemingly endless stream of information about other people, societies and cultures, and expand their perceptions of how other people live and perceive the world around them on a day to day basis.

Instances of cultural friction and differences can also be very apparent on social media platforms, as people interpret statements and aspects of media differently all over the world [4]. Social media often involves the use of a range of communication skills and the ability to understand limited material in multiple cultural contexts. Some users are naturally better at social interactions than others, moreover, some are more forgiving of mishaps in these interactions than others [5].

A. Social Media and Study Abroad

Social media sites and software are increasingly attracting the attention of academic and industry researchers intrigued by their affordances and reach. There is a large amount of scholarship on these emergent phenomena [6-8].

Businesses are struggling to harness the power of social media technologies. Twitter, Facebook, blogs, YouTube

are now where customers discuss products and companies, write their own news, and find their own deals. When global consumers are rating a company's products in public forums with which the commercial organsation has no experience or influence, then the company is vulnerable [9].

This is especially true of universities as many of them are moving into the global marketplace, trying to attract overseas students and provide increasing international study opportunities for their own students [10]. Planning international activities in a modern university in the new global economy calls for a complex decision making process, based in part on whether a particular activity is intended to tap local knowledge or to support a university's existing activities and marketing abroad [11].

Studying abroad is a rewarding experience that is enjoyed by thousands of college students every semester. By studying abroad, students are given the chance to immerse themselves in a culture that is different from their own. There have been a number of significant studies of the study abroad experience, particularly among American undergraduates. Many of these endeavor to examine a number of key questions [12] :

- What kind of students study abroad, and how these students differ from those who don't ?
- What changes occur in students when they study abroad ?
- What aspects of the individual contribute to those changes ?
- What are the long term effects of the study abroad experience ?

A number of specific studies have assessed changes in attitudes and perceptions toward international understanding by American university students who had spent a year of study abroad at a European university. The results indicated increased levels of international political concern, cross cultural interest, and cultural cosmopolitanism for the study abroad group [13]. Other studies have focused on how faculty-led study abroad program can affect the cross-cultural sensitivity of American student learners. Results suggest that short-term programs can have a positive impact on the overall development of cross-cultural sensitivity [14].

It is well known that Social media technologies are have been widely-adopted by students and, consequently, have the potential to become a valuable resource to support their education. Studies have shown that in a comparison of faculty and students, students are much more likely than faculty to use social media and are significantly more open to the possibility of using such technologies to support educational work [15]. Another study investigated the role of social interaction in language gain among study abroad students in France [16]. However, very little work has been undertaken examining the impact of social media use to engage students in cross-cultural activities and study abroad..

B. Gamification

Gamification, as defined by Deterding [17], is the process of adding game elements in a non-game context. The term "gamification" is relatively new, but the process of adding game like elements, like a point system, has become rather familiar in modern life. Gamification principles have been applied in many scenarios where a person is awarded "points" for performing an arbitrary task. For example, credit card companies reward their customers points for making certain purchases, airlines give out frequent flier miles, and even schools and libraries will keep score of how books children are reading and reward them for this activity. Adding game elements to an application can create a better user experience and foster a sense of engagement with the user. There has been an increased amount of interest in the topic recently, much of which centers around ways these principles can be better applied [18].

Perhaps the most effective way to look at gamification is to focus on creating the actual game. The classic game model, as outlined by [19], defines a game as:

"A rule based formal system with a variable and quantifiable outcome, where different outcomes are assigned different values, the player exerts effort in order to influence the outcome, the player feels attached to the outcome and the consequences of the activity are optional and negotiable."

Simply adding points to an existing application is not an effective way to make an application engaging. The player should feel in some way attached to the game, or else they will not find any incentive to play. The best way of accomplishing this is to design games with the users in mind. If the user's goals and needs are not considered throughout the design process, the game will be meaningless [20].

Researchers at the University of Tampere in Finland, along with Nokia Research, added an achievement system a photo sharing application [21]. The aim of the study was to test if users would experience a sense of playfulness in a non-game system, and to find a way to encourage users to utilize more of the applications features. Users were awarded points for uploading photos or sound clips and were awarded achievements. Reactions from users were recorded over an eight week period, and the study found that users were mostly indifferent to the system. However, a feature in which uploaded photos were tagged with GPS coordinates and organized accordingly was reported as being under-utilized. If the achievement system tapped into this location information, users reported that they felt they would have been more engaged. This draws a parallel with research in the social media sphere, where the use of spatial location information can be used to increase user engagement and increase cultural awareness.

Queensland University of Technology added game elements to an application called Orientation Passport [22]. The application was primarily a digital schedule that provided students with a customized list of events depending on their major. Students were awarded achievements by checking into events, adding people to their contact list, scanning QR or barcodes and answering questions related to university services. Twenty-six students participated in the study. Students reported that the addition of the achievement system added value to their experience and they had fun using the app. The

participants reported that unlocking the achievements which involved contextual information, and were more challenging, were more fun to complete. These tasks, which included checking into events and finding locations, were reported to enhance the event, as they were based on the existing activities. Again this study demonstrates the successful use of context sensitive, spatially located media within a game environment.

Similarly, a large IT enterprise implemented a point system to their Social Networking Service (SNS) in order to encourage content contribution [23]. Users received points for contributing photos, lists or comments. An analysis of the SNS revealed that comments drew the most visitors, so a point scheme was created to reward this existing behavior. Half of the site was able to earn points for six months while the other half remained unaware of the point system. The points created a dramatic increase in levels of content in the first three weeks, followed by a drop in participation in the following weeks. The point system was found to have an overall positive effect on content generation. A follow up study was conducted 10 months later which removed points altogether [24]. It was shown that the point system increased activity on the site, but decreased the quality of activity. Users tended to post short comments, such as “Hi” or “howz work goin on..?” while the point system was in place. Once the point system was removed, the rate of short comments lessened. However, overall user activity decreased significantly after the point system was removed as well.

This paper explores the addition of game elements to a Facebook group, the group consisted of students from SUNY Oswego in the USA and the Tripura Institute of Technology in India. Group members were awarded points for posting photos and leaving comments in the group. The aim of this research was to study if the addition of game elements to the group would increase the group member’s interest in studying abroad, and to explore effective ways of gamifying social media.

III. Game Design

This project attempts to produce a mechanism for a student who is not traveling abroad to experience a different culture, and in turn potentially increase their interest in studying abroad. To create a more immersive experience than reading a blog post or viewing a set of photos, a game was designed that focused on interactions between different cultures over social media.

For this project, gamification elements were added to a Facebook group called “Oswego Abroad”. This group was composed of fourteen participants from SUNY Oswego in the U.S.A. and sixteen participants from the Tripura Institute of Technology in India. For the Oswego Abroad game, a gamified point system was added to the Facebook group.

Participants were instructed to post photographs of “culture” to the group, along with a brief description, and comment on these posts. A point was awarded every time a player uploaded a photo of some element of their culture. No definition of the term “culture” was provided. It was left subject to interpretation by each individual player and participants were encouraged to use any definition of culture they chose. For every post that was created, the participant would receive a point. For every comment the participants wrote, they would receive a point, and the participants whose post they commented on would also receive a point.

An opportunity for stealing points was created. If a participant was able to replicate, or mimic, another participant's post (using the same caption), they could steal all of the points that had accumulated on that post. For example, if a player in India uploaded a photo of a cup of coffee with the caption, “Morning coffee” another player in the U.S.A. could easily steal the points by uploading a photo of their morning coffee using the same caption. The captions had to be relevant, if a player posted a photo of something that wasn’t a cup of coffee but used the same caption, then no points would be stolen. When stealing points, the person that successfully mimics the posting was awarded all the points from the post entirely, including those retrieved from comments.

It was hypothesized that within the game, the majority of points would be acquired through steals, as this provided a mechanism allowing participants to garner a larger number of points from one action. It was also hypothesized that the creation of a point based game would motivate participants to post more photos in competition, while the comparative cultural aspects of the game would simultaneously incite their interest in studying abroad or learning about another culture.

IV. Participants

Participants for this study consisted of two different groups, these groups made up the independent variable of the study. The intent was for there to be two roughly equal sized groups of participants, those living and/or presently working in the United States, and those living and/or working outside of the United States for the duration of the study. For those not within the United States, a group of students at the Tripura Institute of Technology in Narsingarh Argartala, Tripura, India were used. Sixteen Indian students were identified as willing to participate in the study and were able to offer their input for surveys that would be conducted throughout the study. For those participants in the United States a brief recruiting process was undertaken to recruit students based on the campus at the State University of New York at Oswego, and fourteen American students were recruited. Although the same information was collected from participants in both countries, the study primarily focused on assessing and measuring the attitudes of the students based in the U.S.A. towards study abroad programs.

The sample size in this study was dictated by the number of participants available in both the U.S.A. and India. With fourteen students in the U.S.A. and sixteen students in India participating, and assuming an effect size of 0.5, and a significance level of 0.05, this gives an overall p-value of 0.262.

Prior to the experiment or any questionnaires were

issued and participants were asked to complete an informed consent form which notified them that they were volunteering themselves for psychological research if they chose to participate, and could end their participation at any time without penalty. The consent form outlined the full nature of the research, as well as the anticipated schedule of how long the game would run, and the expectations for participation. Those that completed this form were then directed to complete the pre-analysis questionnaire consisting of demographic and basic Likert Scale questions regarding their behavior and feelings about technology, social media, and culture. There was no compensation given to any participants for their involvement with the project, it was hoped the game mechanic would be engaging enough to motivate the participants to interact regularly with the Facebook group.

The gender balance among the American participants was well balanced with approximately equal numbers of male and female players. Of this group, 66% reported that they had previously traveled to a country outside their own country. The demographic information for the American students is shown in Table 1. Table 2 contains the response to a question on a self-assessment of levels of computer literacy and Table 3 shows how much time the participants estimated they spend each day on social media.

Table 1. Demographics of American Student Participant Population

Caucasian (non-Hispanic)	66 %
Asian/Pacific Islander	22 %
Hispanic	11 %

Table 2. Computer Literacy of American Student Participant Population

No Literacy	0 %
Some Literacy	11 %
Average Literacy	22 %
Good Literacy	33 %
Excellent Literacy	33 %

Table 3. Hours per Day Using Social Media by American Student Participant Population

0 Hours per Day	0 %
<1 Hour per Day	22 %
1-3 Hours per Day	55 %
4+ Hours per Day	22 %

V. Measures

The independent variable for this experiment was the geographic location in which the participants of this study participated from. The intent was for approximately half of the participants to be outside of the United States, and for the other half of students to be within the United States.

The dependent variables for this experiment were the participant feedback regarding technology, social media, and cultural factors where participants were asked to gauge own responses and feedback on a Likert Scale. This was measured in a pretest at the end of March 2015, and was then measured again at the end of April 2015 using a post test of the same questions to indicate any potential changes over the time the students participated in the project. The experiment lasted exactly four weeks between the pre-test and post-test surveys. The difference in participant responses between the two tests was considered to be an effect of the Facebook game that took place over the four week period.

VI. Procedures

The study that was conducted was experimental. The independent variable was the geographic location of each participant, either in India, or the United States. The dependent variable was participant feedback through the course of a survey both before and after the interaction with culture based Facebook game. Prior to conducting the experiment, all participants were required to complete the previously described informed consent form. Due to geographical limitations, a digital form was used to obtain consent from those participants in India, although a paper version of the same form was used for participants in the United States for consistency purposes. The participants were then broken into two groups based on their geographical location, and asked to complete a brief survey consisting of about twelve questions relating to their technology, social media, and cultural perspectives. Once this initial survey was completed, the Facebook group was activated and the game was initiated.

The concept of the game, as described above, was to create and share photographs that participants considered to be representative of culture on a group page created on Facebook for the purpose of this study. The point system was fairly simple and was controlled by the student researchers from SUNY Oswego who were working on the project. Posting an image with a caption would be awarded one point. Commenting on the post was also awarded one point. If a post from a participant was commented on, both the person commenting and the person who created the post were awarded one point. Participants also had the ability to steal points by replicating a photograph that was previously posted on the page. If the experimenters agreed that a post was effectively replicated, all points of the original would be stripped and given to the individual who replicated the post.

This game took place over four weeks in March and April of 2015, with weekly scores released to the participants through Facebook on the shared group page. Following the completion of the game, final scores were tallied and posted on the group page, and instructions were given to participants to complete the post-test analysis surveys.

The instructions for the post-test survey were identical to the pre-test survey, with the addition of four questions that were more specific to the Facebook game and participant involvement. The identity of individuals was kept private and each individual was assigned a participant number for the pre and post analysis, and only that

identifying number was used to link pre and post test results.

VII. Results

One of the major hypotheses behind this study was intended to investigate the effect that exposure to cultures other than one's own might have on that individual's interest in visiting other countries. It was expected that this study would find that exposure to a game through social media might result in a change in the user's interest when considering visiting other countries. The two groups, one located in India, and one group located in the United States were given the same survey before and after exposure and involvement in the game. The results of both surveys were analyzed for change.

A2 x 2 two way mixed analysis of variance was conducted to determine whether participant location and participation in the game had any influence on a number of questions. Based on the study's design, each question was individually analyzed to measure change.

- The interaction between participant location and participant interest in studying in a country other than their own was not significant, $f(1, 7) = 2.228$, $p > .05$.
- The interaction between participant location and reported comprehension of Facebook's picture posting procedure was not significant, $f(1, 7) = 1.023$, $p > .05$.
- The interaction between participant location and frequency of eating food from a different culture was found to be significant, $f(1, 7) = 5.983$, $p < .05$.
- The interaction between participant location and frequency of watching films from a different culture was not significant, $f(1, 7) = 2.722$, $p > .05$.
- The interaction between participant location and consumption of news for learning about other countries was not significant, $f(1, 7) = .419$, $p > .05$.
- The interaction between participant location and frequency of using Facebook or other social media as a source of news was not significant, $f(1, 7) = .419$, $p > .05$.
- The interaction between participant location and the use of the internet to learn about other countries was not significant, $f(1, 7) = 1.617$, $p > .05$.
- The interaction between participant location and the connection participants feel with others through social media was not significant, $f(1, 7) = .000$, $p > .05$.
- The interaction between participant location and level of reported engagement with others while using social media was significant, $f(1, 7) = 13.144$, $p < .05$.
- The interaction between participant location and participants' frequency of comparing their own culture to cultures around the world was not significant, $f(1, 7) = .486$, $p > .05$.

An analysis of the effectiveness of the gamification aspects that had been implemented within the Facebook group was also undertaken. This study was attempting to discover an effective way to add game elements to a social media group, to do this the researchers examined how participants acquired points while interacting with the Facebook group.

By the end of the four week period that the game ran, 671 photos had been posted to the group (664 original posts, 7 shared photos) through 344 posts. It was noted that 291 (84.593%) of the posts were made from participants in India, and 53 (15.407%) were made from participants in the United States. During the game period 553 comments were posted, 499 (90.235%) of them being from India and 54 (9.765%) of them being from the United States. This may demonstrate a much larger level of engagement with the game among the Indian students than the American students.

Table 4. Final Scoreboard for the Facebook Game

Participant 1	391
Participant 6	323
Participant 4	207
Participant 30	90
Participant 16	67
Participant 11	57
Participant 17	46
Participant 8	46
Participant 7	44
Participant 26	39
Participant 25	34
Participant 13	31
Participant 31	24
Participant 19	9
Participant 17	8
Participant 28	2

During the playing of the game 1413 points were generated, with the winner generating 391 points. These results are shown in Table 4, where participants 1-16 were those from India, and participants 17-30 were those in the United States. Six steals were made which generated 51 points (3.609%). The top scorer contributed 116 comments to the group (20.976%). The top three scorers in the game contributed 102 posts (29.651%), and 413 (74.684%) comments. The most common posts overall were made about specific buildings, with 76 posts (22.093%) consisting of 135 photos generated about this topic (Figure 1). The most common post for Indian participants was buildings, with 76 posts consisting of 134 photos about this topic, while the most common posts for American participants were about food or drink, with 10 posts and as many photos on this topic (Figures 2 and 3).

International Journal of Innovation and Research in Educational Sciences
Volume 3, Issue 4, ISSN (Online): 2349–5219

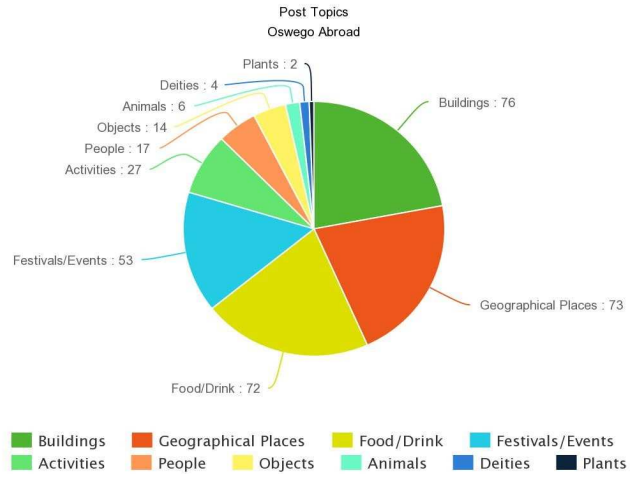

Fig. 1. Breakdown of Overall Postings on Various Topics

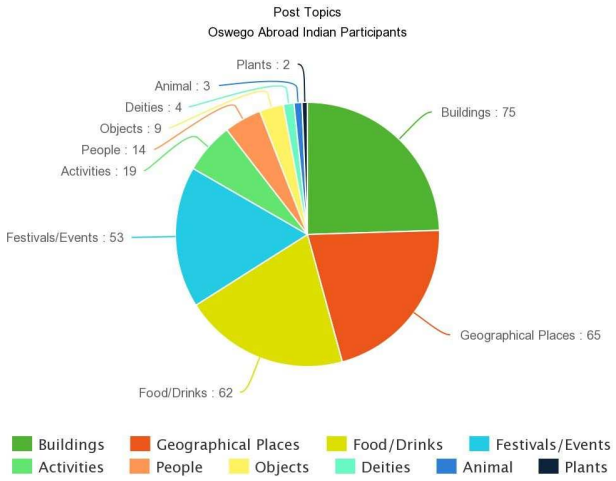

Fig. 2. Breakdown of Indian Postings on Various Topics

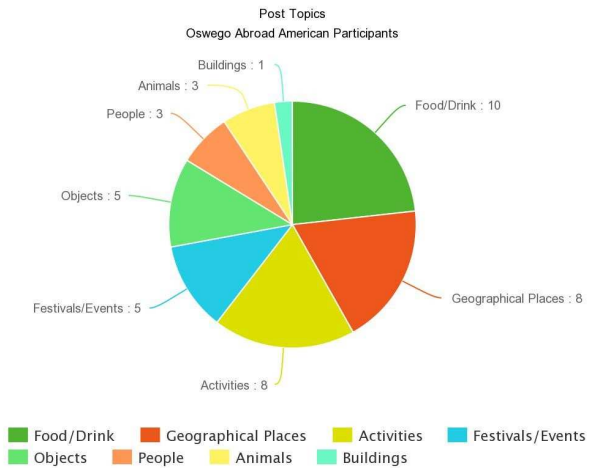

Fig. 3. Breakdown of American Postings on Various Topics

Of the comments, 332 (60.036%) were only one to two words long, with the Indian students contributing 307 (92.470%) of these and the American participants contributing 25 (7.530%). 115 (20.796%) only consisted of only the word “nice” or “nyc”, and 43 (7.776%) of the comments consisted of a summary of the description. This observation is similar to that made by Thom et al [24] who demonstrated that a point system may increase activity, but decrease the quality of activity.

VIII. Discussion

During this project, cultural differences related to use of social media were apparent between players that live in the United States and India. It was observed that often players in India often did not upload original photos. This was noticeable due to watermarks and apparent professional grade photography. Indian players also wrote long captions, often consisting of four or more sentences, making it increasingly difficult for other players to mimic. This could have been a strategy by some of players so that others could not steal their points.

Fig. 4. An Example of a Successful Steal

International Journal of Innovation and Research in Educational Sciences
Volume 3, Issue 4, ISSN (Online): 2349–5219

After a handful of instances where Indian players uploaded photos that were not taken by them, it was observed that players in the U.S.A. started to do the same thing. Within the game instructions and rules, it was not specifically specified that posted photos had to be captured originally by the poster. This was a strategy, or perhaps misunderstanding, that was not anticipated by the researchers. It is unclear whether this was used to gain points or it was a cultural barrier between the Indian and American participants.

Fig. 5. Two Players Commenting “nice” and “nyc” on a Post

Fig. 6. Indian Participants Were More Likely to Post About Ancient Buildings and Places

The results show that the interaction with this game did not significantly increase the participant’s desire to study abroad, however participants did report that they felt more engaged with their social media and had an increased their desire to try another culture's food. During the project many of the comments on the Facebook group page lacked any emotive substance and seemed to only be made to gain points through the gamification mechanism. Many of the comments were only one or two words long, and many of these comments only consisted of the word “nice” or “nyc”. It was common for the participants who were achieving high scores to make many of these short comments. It was expected that points would be generated by a combination of comments and steal, as this was how the game was designed.

A number of players did successfully steal points (Figure 4), however only a small amount of points were generated this way, and those who performed the best made the most comments. For example, the participant in third place only made 22 posts, but made 152 comments and was able to earn 207 points by the end of the four weeks. It was common to see the three lead scorers posting short comments onto one another's posts (Figure 5), which in turn helped boost their own scores. This behavior did not seem planned or deliberate, but rather seemed to be a common strategy employed independently. If one of these three participants made a post, and the other two each commented “nice” on the post, then poster would receive three points and each of the others would receive one point each.

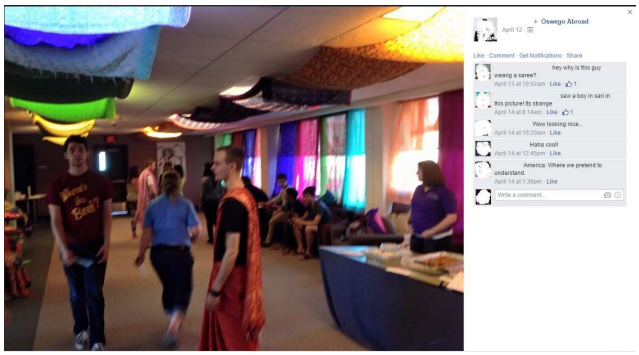

Fig. 7. American Participants Were More Likely to Post About Activities and Daily Life

If the game were to be conducted again, many of the rules would require clarification. For example, in this game participants were told to give a “brief” description of the photo. This was intended to be single sentence or phrase, but would often, in practice, be a full paragraph. These descriptions were often brief synopsis of buildings or areas with large amounts of history, so a paragraph would be a brief description of them (Figure 6). This in turn made many photos difficult to replicate. It was occasionally difficult to tell if a photo had been replicated due to poor descriptions. Photos would be uploaded in close proximity that were stylistically similar with different descriptions (Figure 4).

Fig. 8. Indian Participants Also Posted About Daily Life, But this was Comparatively Less Frequent

The most frequently observed photos Indian players posted were about buildings, geographical places and food (Figure 2), while the most common posts for Americans were about food, geographical places and activities (Figure 3). The Indian definitions of culture seemed to be more based in their cultural history, while the American definition seemed to be based on what the participants were doing at the current time. There were very few Indian posts about what modern life is like in their area.

The majority of the photos about buildings were of ancient buildings and temples (Figure 6), and very few of the university or college where the students are studying. American posts tended to be related to activities based around college life and campus related activities (Figure 7). Even the photos of U.S.A. based locations often featured what appeared to be college aged people in the photos, peers or friends perhaps. The Indian participants did post a few photos of this nature, but they were comparatively less frequent (Figure 8).

IX. Future Work

If the experiment were to be conducted again, many of the rules would have to be clarified. For example, participants were told to give a "brief" description of the photo. This was meant to be around one sentence, but it would often be a full paragraph. These descriptions were often a brief synopsis of a building or an area with large amounts of history, so a paragraph of description can be considered brief (Figure 6). This however made many photos difficult to replicate. Similarly, it was occasionally difficult to tell if a photo had been replicated due to poor descriptions. Scenarios arose in which photos would be uploaded in close proximity that were stylistically similar with different descriptions and it was difficult to determine if this was coincidence or an attempt at a steal. If there had been more detailed guidelines on the length of description to be used and further explanation on how to steal, this issue may not have occurred.

Another issue arose where participants were not uploading original photos. Participants were instructed to post their own photos, but often posted photographs they had obtained from the internet. The photos that were acceptable for posting would have to be clarified in the future. What constitutes a comment could have also been better clarified. Though there were conversations happening in the comments, the comments were dominated by one to word posts. This issue had arisen in similar research [23, 24]; however no measures were taken to solve this issue during this research project.

X. Conclusion

This project was intended to increase cross-cultural communication and interest in studying abroad. Post-test surveys showed that while playing a game based on cultural issue such as this one did increase communication and overall interest in another culture, especially in relation to food, it did not necessarily increase the desire to study abroad. Further research of this nature could benefit by giving more explicit instructions as well as providing more interesting ways to accumulate points. Perhaps the "stealing" idea was not effective, but there may be other, more creative, ideas that would catch the attention of the user. It would also be beneficial to provide some kind of reward incentive to hold player's interest. As far as using social media for understanding and communicating across cultures, this project did reach its goal in that it increased general interest of the participants in the day-to-day activities and history of another country.

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