Utilization of a Serious Online Game in a Human Development and Family Studies Undergraduate Public Policy Course

Jacki Fitzpatrick, Ph.D.
Texas Tech University

Erin Kostina-Ritchey, Ph.D.
Texas Tech University

ABSTRACT. This article summarizes use of a serious online game/simulation (SOGS) and assessment of students' perceptions of the SOGS. In this teaching activity, students assume roles of resource allocators who decide which communities receive assistance during an epidemic. When the simulation ends, students see some consequences of their decisions. such as financial costs and death rates. One week after completing this SOGS, students took an anonymous survey which included open-ended short-answer essay questions. Two coders engaged in emergent content analysis of the essay responses. This analysis revealed two dimensions of positively and negatively-valenced themes. The results highlighted the value of conducting activity-specific assessments. Suggestions for future research and SOGS activities are offered.

Keywords: teaching; technology; online games; class activity; public policy; group dynamics; humanitarian aid; SoTL

Direct correspondence concerning this article should be sent to Dr. Jacki Fitzpatrick, Texas Tech University, Human Development & Family Studies Department, 1301 Akron Avenue, 507 College of Human Sciences, Mail Stop 1230, Lubbock, Texas, USA 79409-1230. Contact: Jacki.Fitzpatrick@ttu.edu (Be mindful that this email address is case-sensitive. It requires a capital "J" and capital "F"; all other letters must be lower-case.)

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Introduction

Family science instructors may face challenges in finding teaching activities that engage students (Ballard, 2001; Greene, 2008) and expose them to issues they may face in their future careers (Fox, Miller, & Barbee, 2003). If instructors anticipate their students might deal with service difficulties (such as inadequate resources), then it is worthwhile to create practice opportunities within courses. One venue for such practice is serious online games/simulations (SOGS). This article summarizes the use of SOGS in an undergraduate course and qualitative analysis of students' reactions to this activity.

SOGS in the Context of Realistic Instruction

Whether undergraduates pursue social science careers that focus on direct client care or policy development, they are likely to face professional situations with inadequate resources, organizational constraints, and unsolvable problems (Cianciolo, 2015; Hoge & Castro, 2012; Schindler & Coley, 2007). Indeed, new professionals can be overwhelmed or disenchanted by challenges they face early in their careers (Hansen & Mulholland, 2005). Professional preparation has significant consequences for issues such as staff retention and quality of client care (Fox et al., 2003). In this context, it can be illuminating to expose students to various scenarios before they enter their professions (McKinnon & McCrae, 2011; Shaw, 2003). Traditionally, instructors have used exposure techniques such as documentaries (Simpson, 2008), role plays (Greene, 2008), field trips (Sanders & Armstrong, 2008), and service learning (Swanson, King, & Wolbert, 1997). These techniques can be informative and enlightening but often have limitations (such as ethical restrictions) the hinder realism and range of exposure.

Instructors of family studies courses are encouraged to utilize resources and activities that foster students' critical thinking skills. One approach is problem-based learning, in which student groups are exposed to situations relevant to course concepts. The situations become a venue through which students can use concepts to evaluate conditions and identify potential responses (Bartolic, Lyon, Sierra, & White, 2016; Blaylock & Kopf, 2009). Instructors are encouraged to use problems based on actual events or feasible scenarios. Similar to conditions in the real world, groups do not receive solutions to the problems (Sandifer-Stech, & Gerhardt, 2001). Rather, groups need to confront scenarios where they have incomplete resources and generate an action plan via collaboration.

SOGS is an example of a problem-based resource. They are designed to display realistic conditions or parameters of professional tasks (Blaylock & Kopf, 2009). SOGS provide a venue through which teachers can reveal situations that would be difficult or impossible to recreate in the classroom, such as refugee migration (Nesteruk & Price, 2015), disabilities (Roccetti, Marfia, & Palazzi, 2011), or disease epidemics. Similar to documentaries (Simpson, 2008), the games can

give rapid exposure to phenomena. Within an hour, students can see a series of events that would take weeks or years to unfold in the real world. If students are completely inactive in response to the events, then SOGS reveal logical consequences of apathy or inertia. Unfortunately, there are many parallels to such consequences in the real world (e.g., Willingham, 2016) to which instructors can draw connections.

However, passivity is not the primary purpose of SOGS. Instead, the purpose is to (a) demonstrate conditions of a specific phenomena, (b) allow learners (as "players") to evaluate conditions and select actions in response to conditions, and (c) learn consequences of these actions (Heinrichs, Youngblood, Harter, & Dev, 2008). There is emphasis on the realism of parameters and players' experiences, since this increases the likelihood that SOGS are effective environments for testing participants' knowledge (Nassiri-Mofakham, Ghasem-Aghaee, Nematbakhsh, & Baraani-Dastjerdi, 2008). Similar to the real world, simulation details can be emergent and may change in response to unforeseen circumstances or participants' actions (Jiao, Sun, & Sun, 2007). Simulations can be run repeatedly so that students can learn to be adaptable from the outcomes of their decisions (Poplin, 2012). According to Cioffi-Revilla (2011), SOGS allow learners opportunities to test multiple scenarios and determine what actions would be most likely to be effective in the real world. Consistent with the medical principle to "first do no harm" (Currie & MacLeod, 2008), such simulations create environments where students can make mistakes without creating adverse outcomes for actual families. Thus, SOGS can foster knowledge or skill development in safe spaces for trial-and-error learning.

Course Context

During the past several years, the first author taught an undergraduate public policy course in a Human Development and Family Studies (HDFS) Department. This course focuses not on family-specific policy issues such as adoption or LGBT marital status, but rather on general public policy topics such as health care, education, employment, immigration, justice and poverty. Some argue that knowledge about such general policies is essential for social science and family studies students (Bowman, Bairstow, & Edwards, 2003; Broughton, 2011; Shaw, 2003). Indeed, entry-level jobs for individuals with HDFS undergraduate bachelor's degrees might be available in environments that focus on general rather than family-specific policies (National Council on Family Relations [NCFR], 2015). For example, a survey of post-bachelor's degree employment revealed that new professionals were working in areas of practice such as financial management, health, juvenile justice, K-12 education, mental health, physical disabilities, recreation and substance abuse (Walker & Blankemeyer, 2013). The course'soverall purpose is to inform students about the ways policies impact and are impacted by families. Although the course is primarily designed to focus on US policies, the instructor persistently emphasizes that the global environment can have direct and indirect effects on US families and communities. This content aligns with three of NCFR's (2014) family life education content areas (1 – individuals/ families in societal milieus; 8 – law & policy; 9 – ethics).

Method (Teaching Activity)

SOGS Selection – The Great Flu

In order to be educationally salient, instructors need to choose simulations that are relevant to their course content. The first author explored several SOGS and selected *The Great Flu* (TGF; TPM Games, 2011) for this course (see Fitzpatrick & Kostina-Ritchey (2013) for more information about the selection process). According to Göbel (2016), TGF is a serious game that highlights socially salient dilemmas and has five flu options (Kai, Golden, Jabali, Gamera and Broadway). These flus are actually pandemics that spread across the globe and affect several continents simultaneously.

The viruses vary in intensity and degrees of damage. For example, when a player (resource allocator) took no action in response to the Kai Virus, the result was 17,452,537 deaths and 850,763,175 infected individuals. Relative to the infected population, this represented only a 2% death rate. By contrast, the Broadway virus resulted in 275,051,789 deaths (11% death rate) and 2,458,974,533 infected individuals. Given that the global population is approximately 7.5 billion people (U.S. Census Bureau, 2017), the Broadway virus would be indicative of the consequences if 33% of all individuals contracted a disease. Each simulation is designed to represent progression of the epidemic over a 33-day period. This period reflects emergency and short-term intervention phases in actual humanitarian aid/disaster relief (HADR; e.g., Beresford & Pettit, 2012). Parallel to actual diseases (Guerrant, Oriá, Moore, Oriá, & Lima, 2008), infected individuals (as represented within TGF) might have extensive and long-term consequences from the flu. That they survived should not lead to the assumption that they are healthy or able to fulfill basic relational (including parenting) tasks. Therefore, a single flu could have substantial consequences for family functioning over time (Almond, 2006). Maunder et al. (2006) also reported that hospital staff who provided care during the SARS outbreak experienced elevated rates of burnout and post-traumatic stress disorder. Consistent with ecological theory (Bronfenbrenner, 1979), TGF reveals there would be disruptions of multiple domains (such as education, employment, and health care) if a pandemic occurred.

The “player” assumes the role of a resource allocator (e.g., humanitarian aid worker, political leader) who decides on actions to take (such as sending research teams or isolating infected individuals). The player receives limited resources and it is impossible to protect everyone from infection. So, the best outcome is to minimize the degree of harm the epidemic causes. This simulation’s realism exposes the player issues such as economic/legal constraints, logistical problems in aid distribution, and resource/need disparities. Such issues are common in HADR conditions (Stirrat, 2006; Welling, Ryan, Burris, & Rich, 2010). Thus, TGF has potential to reveal some core matters in policy development/implementation and HADR work.

TGF has eight basic action options: (a) distribution of face masks; (b) improvements of health care or research facilities; (c) closures of public locations, such as markets, schools, and airports; (d) isolation of infected individuals; (e) creation of warning systems; (f) distribution of

public information; (g) storage of medications; and (h) research teams, which can be sent to infected regions. Each action is accompanied by an explanatory statement and associated costs. For example, the statement for facility improvement clarifies that vaccines will be created more quickly when facilities have advanced resources and that the cost of this action is 200,000,000 Euros (approximately 235,695,000 US dollars). This cost is 10% of the entire budget (2 billion Euros) provided for responding to any of the five epidemics. After an allocator has taken an action, TGF indicates its impact by noting the degree of amelioration or improvement achieved. This feedback has some parallels to evidence-based research used in reference to actual family and social support programs (e.g., Bogenschneider, Little, Ooms, Benning, Cadigan, & Corbett, 2012; Knox, Burkhart, & Howe, 2011). Indeed, cost-benefit analysis can be an important element of policy development and program implementation (Lee & Aos, 2011).

Along with financial limits, there are temporal limits on when certain actions can be taken. Specifically, a particular rate of population infection must be reached before making substantive responses in certain domains such as financial, law enforcement, and transportation. For example, airports cannot be shut down during the first two days of a flu outbreak because this would be considered extremely disruptive to the domains and have limited protective value for noninfected communities. Restrictions on allocator actions might seem arbitrary but they offer some important lessons for students. Indeed, limitations (a) prevent an allocator's overreaction that might reflect panic and (b) offer an example of operational constraints (economic, legal, social) that can occur in actual HADR environments. TGF's temporal element can be a means to demonstrate other HDFS course concepts such as offtime events in family development theory (Shai, 2002).

Similar to an actual HADR situation (Welling et al., 2010), the resource allocator cannot undo his actions or reclaim funds that have been spent. In contrast to leisure online games, TGF was not designed to contain hidden resources or "Easter eggs" that allow the player to reverse decisions, bring individuals back to life, or acquire additional funds. Similar to HADR (Kelley, 2010; Stirrat, 2006), students (as players) can only experience logical consequences of their choices and move forward to subsequent phases of the response process. According to Wiklund, Rudenmalm, Norberg, Westin, & Mozelius, (2015), these parameters align with "aims to teach players both about effectiveness of various interventions as well as the politics and ethics of enacting them" (p. 608).

Instruction Prior to SOGS Activity

To facilitate links with course concepts, student engagement in TGF is preceded by readings and a lecture. The first author selects two articles (e.g., Kelley, 2010; Stirrat, 2006) that give overviews of HADR and policy issues. Articles typically address general challenges in HADR and specific issues that emerged in response to particular events (Haitian earthquake – Kelley, 2010). The articles also address family-specific challenges such as parent-child identification and reunification. Students are informed they are expected to read the articles before to a lecture given by the second author.

The second author's lecture is based on her work experience in Central Asian countries and lasts 80-85 minutes. Lecture content focuses on program implementation in reference to natural disasters, internally displaced groups, group conflicts, refugees, social support, health education, and medical services. During the lecture, the second author also discusses ethical issues relevant to policy and program development.

SOGS Activity

After the lecture, the second author and students move to a computer lab. The students form small groups (3-4 students). They are required to complete the TGF simulation in groups rather than individually because actual HADR is not a solitary activity. Instead, HADR events typically rely on coordination among multiple teams within and across agencies (Welling et al., 2010). Similar to real teams, student groups must communicate with each other to reach agreement on which actions they will take (within TGF). The lab has 24 dual-screen computers and some extra chairs, making it possible for each group (of 3-4 students) to gather comfortably around a single computer. The second author has not observed that the lab's physical environment places undue hindrances on group communications.

After group formation, the second author provides general orientation to TGF. She describes this SOGS' general purpose, how to navigate various parameters, and tools (such as select a virus, scan the global map, monitor death rates, select an action, or view an action's impact). The second author notes various additional features that emerge during a simulation. For example, TGF contains pop-up news reports summarizing events that might realistically occur in a pandemic (e.g., meetings of world leaders, riots, newly emergent flu-related industries). These reports are not central to the simulations parameters but do add to the overall tone of realism.

After groups start engaging with TGF, the second author remains in the lab. She moves through the room to view their progress and provide general feedback if requested. However, she does not advise groups on (a) which actions they should select, (b) whether the actions are well-timed in proportion to epidemic conditions, or (c) what impact the actions are likely to have. The second author's degree of participation parallels a HADR supervisory role in which specific interventions of every team are not micromanaged (Stirrat, 2006). Her monitoring role also aligns with recommendations for applied teaching activities (Ballard, 2001; Fitzpatrick, Boden & Kostina-Ritchey, 2010; Teemant, Moen, & Harris, 2012).

Overall, the second author observed that groups tend to become engaged in TGF and with each other. Some groups appeared to be satisfied with a casual decision-making process and simply watching the outcome of their actions. Such groups tend to have mild curiosity about worst-case scenarios, such as how bad an epidemic can become, but little concern about the potential impact. By contrast, other groups appeared quite drawn into the parameters of the simulation. Their discussions, which could be overheard, revealed they were concerned about the communities the epidemic hit and wanted to "save" as

many people as possible. Group members debated their options and reacted to consequences of their decisions. This degree of engagement is consistent with other lab activities in which some individuals appear to forget about the artificiality of the conditions (e.g., Jacobson et al., 1994; Kahn, Gary, & Shen, 2013).

Since all groups are in the same room, there are varying degrees of interest in social comparison. Consistent with descriptions of competition in actual HADR (Kelley, 2010; Stirrat, 2006), some groups evaluated their success (such as numbers of lives saved or balance in the financial account) in reference to their peer groups. Indeed, the second author has repeatedly observed that some groups become so focused on competition and on planning their next moves that they lose valuable time within TGF. During group discussions the epidemic spread unchecked and the situation was relatively worse than when they began paying to attention to their peers. Some groups also became more secretive after learning that others were attempting to listen to them. These groups appeared to divert some effort away from their actual decisions and into protecting their power as a potentially effective or winning group. These intergroup dynamics align with issues that emerge between HADR organizations (Hoving, Wallis, Docrat, & DeVries, 2010; Welling et al., 2010).

The second author also observed that some groups intentionally chose a protectionist strategy. When they observed the epidemic's reach beyond its initiating location, they anticipated when the flu would likely impact the US or a specific subpopulation (as one student stated, "all the white people in California"). Having made such decisions, groups would allocate a disproportionate amount of resources to their selected locations. These allocations were made to (a) keep infected populations out and (b) protect families within this location. Indeed, groups often gave resources to their chosen locations even when such resources might not be needed or could have more impact in another country. These regionalist processes can be a means to addressing real-world issues such as power disparities and empathy gaps (Ditto & Koleva, 2011).

Consistent with SOGS principles, groups tended to learn lessons from repeated engagement. After the first simulation, groups were mindful of potential mistakes they had made (lessons learned) and sought to broaden their options. Some groups also engaged in metacommunication about their group dynamics and how they might address their decision-making processes. These discussions occasionally revealed issues about group imbalances (e.g., individuals who were dictatorial or underinvolved). Repeated engagement also gave groups opportunities to explore variations in defining "winning" outcomes. Once they realized it was unlikely that they could prevent all deaths, the second author observed that groups focused on issues such as (a) reducing numbers of total deaths, (b) reducing the numbers in certain locations, or (c) using the fewest resources (i.e., spending the least amounts of money). Although this last criterion might seem somewhat coldhearted, it is a pragmatic issue for agencies with widespread HADR demands (Stirrat, 2006; Welling et al., 2010). Unfortunately, money saved or withheld during one crisis may be needed to address future crises.

The latter iterations allowed groups to choose whether they wanted to run repeated simulations for the same flu or try a different flu (e.g., switch from the Gamera to the Broadway virus). The variety of flu selections within and between groups allowed students to address more nuanced or relativistic views of successful intervention. For example, a death rate of 5% might be indicate failure in response to the Kai virus but success for the Broadway virus. This relativism highlights the fact that success or winning is evaluated in context of particular HADR interventions. Success is influenced not only by a group's choices but also by conditions on the ground (Hoving et al., 2010; Stirrat, 2006). The second author also observed that some groups debated who had been most successful based on disparities in their criteria. Instructors can use this relativism to discuss variations in "success" for other family-specific contexts such as parenting, divorce, work-family conflict, illness, marginalized identities, and ambiguous loss (Dyk & Schvaneveldt, 1987; Luster, Qin, Bates, Johnson, & Rana, 2008; Wright & Wooden, 2010; Zimmerman, 2003).

Post-Activity Debriefing

The authors know this activity can be intense for some undergraduates. During their time in the lab, a few students informed the second author they still had lingering emotions such as worry about imaginary flu victims or concern for actual HADR workers. Therefore, the first author conducts a debriefing discussion. Debriefing provides opportunities for students to discuss cognitive or emotional responses to educational activities (Swan, Mazur, Trullinger, Brock, Ross, Holman, & Yost, 2007). It can also stimulate insights into students' professional growth and allow them to learn from one another's experiences (e.g., Matson, Davis, Steinkohl, & Blavo, 2001; Walsh & Weiser, 2015). The instructor explains that the purpose of professional simulations is to expose students to realistic conditions, which can evoke various reactions. She offers students the chance to share comments, questions, or reactions if they wish. The instructor informs students that this activity has no impact on their grades or class standing and that participation is voluntary. The first author has also conducted debriefments after other teaching activities (Fitzpatrick, 2016). Therefore, she experienced at guiding such discussions.

The first author has some clinical training (i.e., Master's degree in family therapy) that can facilitate the debriefment group discussion process. However, she is not conducting clinical assessments or interventions. If students demonstrated undue distress during the TGF activity or debriefment, then they would be referred to university mental health services for additional care. To date, no students have demonstrated reactions that approach or meet referral criteria.

Along with the specific debriefment there were supplemental discussions about issues relevant to HADR and TGF. For example, the instructor drew links to current events (e.g., natural disasters, mass shootings) that affect families and communities. She also noted parallel processes in other domains, such as resource disparities in health care or empathy gaps in poverty/homelessness intervention. It should be noted that there have been discussions that students initiated when they had questions about events or parallels.

Research Method

As part of an IRB approved study, students had the opportunity to complete a questionnaire approximately one week after completing TGF simulations but prior to debriefment. This sequence was chosen so that data are limited to students' perceptions of the TGF activity and not influenced by class reflection. Participation in this data collection was voluntary and the first author was not present when students completed the first questionnaire. Students were also advised that the questionnaire was intended to be anonymous, so they were informed that they should not write their names on the questionnaires and that the first author would not have access to the questionnaires until after submission of final course grades.

Sample

Approximately 90% of the students who participated in the TGF activity completed the questionnaire (n=47 students).* The sample's mean age was 22.1 years *(SD=1.1)*. Fifty-five percent self-identified as seniors, 34% as juniors and 11% as sophomores. Forty-two identified as women and five as men. In reference to racial/ethnic identity, 36 identified as Caucasian (non-Hispanic), seven as Hispanic/Mexican-American, one as Asian/Pacific Islander/Asian-American, one as Black/ African-American, and one as Multiethnic. One individual chose the "Other" option.

Measures

Participants completed the Course Assignment Perception Scale (Fitzpatrick & Kostina-Ritchey, 2012). In contrast to overall course satisfaction surveys, this questionnaire is designed specifically to assess students' perceptions of specific media-based or active learning activities. In reference to a specific activity, the scale consists of four sections: (a) quantitative measure of positive and negative attributes, (b) quantitative measure of instructions' helpfulness, (c) quantitative measure of improvements, and (d) qualitative open-ended questions. For example, the first section contains six positively-valenced (useful, informative, helpful, interesting, organized, specific) and six negatively-valenced (irrelevant, overwhelming, intimidating, waste of time, unclear, confusing) terms. Students responded to the terms on a 5-point Likert scale (1=strongly agree, 5=strongly agree). Due to moderate-high correlations among the terms, two scales were created. The positive scale had a mean of 20.9 (*SD*=5.1) and Cronbach's alpha of .87. The negative scale had a mean of 14.4 (*SD*=3.6) and alpha of .78. These scales were inversely associated (r=-.68, p<.001).

This study focused on the fourth portion of the scale. Specifically, this portion consisted of six open-ended questions: (a) "*What are problems/weaknesses of this assignment?*"; (b) "*What are valuable aspects/strengths of this assignment?*"; (c) "*In its present form, if you could have this type of assignment in more courses, would you want it? Why or why not*?"; (d) "*What (if anything) is missing from this assignment that you think should be added?*"; (e) "*If you could*

make changes to this assignment, what would you change?"; and (f) "*What else do you think I should know about students' experiences of the assignment?*" The questionnaire form provided a brief space (approximately 1/3 page) for responding to each question. This limitation was for facilitating direct, cogent responses.

Data Analysis

Students provided 232 comments in responses to the question prompts. Twenty-four responses were either neutral (e.g., student wrote "nothing" after every question) or in reference to other topics (e.g., paper grades). Thus, 208 comments were retained for analysis. Working independently, two coders engaged in emergent coding (Patton, 2002). After the first wave of coding it became apparent to each coder that students' responses to open-ended questions were not consistently contained within parameters of the questions. For example, students' responses to questions about changes could contain information about (a) what they liked about the SOGS activity, (b) what they disliked, and (c) what changes they would recommend. Thus, coders created a more dichotomous coding scheme for positively and negatively-valenced responses. The coders independently conducted a partial analysis with the coding scheme and experienced a high level (95%) of interrater agreement. After achieving this level, the researchers coded each student response independently. A third colleague who was blind to the purpose of this study) evaluated a subset of students' responses and concurred that the positive-negative dichotomy accurately reflected distinctions in the responses.

Results

Negatively-Valenced Comments

There were 117 negatively-valenced comments. Some students had generally aversive reactions to this activity. Although TGF is designed to be a SOGS, a few participants found it incompatible with their academic expectations (e.g., "*games are not for school*"). Other students did not seem opposed to games per se but did not find this to be a value-added experience – "*It was good and interactful just I didn't feel like it was worth my time*"; "*It [the game] was useful and got us out of the classroom which was nice. However, I would not suggest having the assignment at the end of a 3 hour class.*" These latter comments may highlight temporal parameters of the course context. Typically, the course has been taught in an evening time slot (6-9 pm). Thus, students did not begin engaging in TGF until the last half of the course period. Some students might have preferred the class period to end after the guest lecture portion or to have a different type of learning activity follow the lecture. Future semesters allow opportunities to explore variations in post-lecture activities.

Some students also disliked the group component of TGF simulations. A typical response to question prompts about changes/improvements "*I would let people do the assignment on their own.*" Similarly, another student wrote, "*I liked the Great Flu game and getting to apply course*

concepts but it would have been better if we could have each played the game instead of as a group." For such students, it is not clear whether their feedback represents an overall preference for individualized learning activities or dissatisfaction with specific parameters such as lab environment or team dynamics. Other students specifically identified challenges or problems in group decision-making tasks: "*Doing the assignment as a group does not fully allow an individual to partake in the assignment. We did not get to make our own choices on how to do the assignment.*"

Such students are correct to say that the authors' decisions to use a group format inherently limits the degree of individual control of the simulation. The authors recognize these parameters might hinder each student's effectiveness in responding to epidemics. Indeed, it is possible that one student might be more successful than a group in minimizing infection and death rates. However, the authors have chosen to emphasize realism in the SOGS conditions. As noted previously, real world HADR is conducted in a complex web of teams and organizations (Hoving et al., 2010; McLachlin & Larson, 2011). Even if they have very specialized skills, individuals rely on coordination across organizations for issues such as supply chains (i.e., resource management and delivery). To the extent that group interactions in TGF simulations expose students to these communicative dynamics at the cost of individualism, students might learn valuable lessons. Group interactions can also facilitate student success in other course requirements such as group exams or collaborative writing assignments (Barton, 2003; Walsh & Weiser, 2015). It should be noted that students' motivations to test their individual skills need not be squelched entirely. Instead, students are free to continue running TGF simulations after the class period has ended. It would be possible for students to see whether they are more or less effective as single players.

Another criticism reflected concern about lack of clarity about the TGF elements or informational overload while the epidemic simulation was running. Comments typical of this theme were "*It was a challenging assignment because I was unsure what to do. The game itself did not really explain all the tools*"; "*It was a little confusing on what to do when we started. We didn't know what the game was asking for*"; and "*I don't like the messages in the right of the screen. I felt like it was going to* [student spelling] *fast. The virus was spreading fast and I couldn't focus on the messages while trying to save all the people.*" In comparison to some recreational games, TGF offers fewer tutorials and less information about its action options. In addition, TGF does not allow players to pause or stop the epidemic while exploring these options. Some students may have preferred a SOGS with a more familiar or user-friendly design. However, TGF limitations have some parallels to the ambiguity of family service work in general and HADR in particular. New professionals can be challenged by the lack of specific instruction about career demands, institutional policies, and client needs (Fox et al., 2003; Hansen & Mulholland, 2005; Swanson et al., 1997). Colleagues are typically unable to stop events while they "learn the ropes." Such knowledge is often acquired by professional experience. This weakness could have been overcome had students been required to engage in repeated simulations until all TGF elements were second nature to them.

Similar to criticism of TGF elements, some students were displeased with the ambiguity of the simulation outcomes and noted that the game "*was different but the directions weren't clear on how to succeed*" and "*There was really no winning in that short period of time.*" These comments reflect some issues addressed in the guest lecture by the second author and HADR literature (Hoving et al., 2010; Tomasini & Van Wassenhove, 2009), such as criteria for success and exit strategies. In reference to improvements/changes, some students encouraged competitive humanitarianism with specific prizes: "*Maybe make it fun/competitive like 1st people to beat virus with least # of deaths get an extra credit point or candy*"; "*Have more of a competition between groups. Maybe have a prize (candy) for the winners.*" Students' participation in completing TGF simulations and subsequent questionnaire was ungraded. They received no assignment course points, extra credit, or non-academic items (such as gift cards). Although actual HADR organizations are not overtly incentivized by prizes, they can receive rewards such as enhanced media coverage or fundraising for their successes (Stirrat, 2006; Welling et al., 2010). Thus, students are correct that rewards can be linked to HADR. In this context, their suggestion of a TGF award could provide a teachable moment to conclude this problem-based learning activity.

Positively-Valenced Comments

There were 91 positively-valenced comments. Students highlighted some benefits of this activity as well. Some reported finding the TGF simulation engaging. For example, students wrote "*It's a game of strategy & it's entertaining*"; "*it is always good to get away from the books and do things with technology. Also, the more interested we are in the class or assignment the better outcome we will have*"; "*I would like you to know that is a good way to add to the learning experience other than just lecture*"; "*This assignment gave us a new perspective for what we were learning…it gives us more visual aids, instead of just taking notes and lecturing*"; and "*very informative…thought it was very cool and new way to think about a real-life situation.*" These statements highlight the value of variety in teaching routines for students. However, the emphasis on learning in the latter comments suggest students saw this use of technology as a value-added experience. Such statements reinforce the merit of exploring techniques other than lectures (Sandifer-Stech & Gerhardt, 2001; Shaw, 2003).

Some students also valued the interaction processes this activity required. In response to questions about the strengths, some students offered parsimonious comments such as "*teamwork*" and "*I got to know my classmates a bit better.*" Similarly, others focused on the inclusive nature of the team composition: "*Being able to be interactive with other students*"; "*Group related, not a normal learning tool (+good) involves everyone.*" Since the second author was present throughout the activity, she was aware that group discussions often concentrated on epidemic issues. Thus, it is unlikely that the process of getting to know classmates focused on other topics such as leisure interests or personality traits. Some students may have recognized the value of educationally-focused interactions.

In reference to TGF's content, some students could identify linkages to course concepts from the immediately preceding guest lecture or other policy topics. Some wrote generic

comments, such as "*It was an interesting way to further our discussion about what we learned in class*"; "*It was easy to tie the overall concepts of the lecture to the game.*" Other students focused on particular issues, such as realistic limits on intervention efforts: "*Good explanation of facts & details that go into policies*"; "*We were able to see how chaotic the spread of disease is. We were also able to see no matter what you do or how much money you throw at it, it is hard to stop or prevent it*"; "*It was crazy to see how fast something can spread & how complicated it can be to stop, how stressful it has to be to the people in power.*" Such comments could be interpreted as pessimistic responses to the simulations. Alternatively, such comments might reflect more accurate understanding of the limits of engagement in public policy issues. Indeed, actual HADR requires colleagues to persist in the face of overwhelming circumstances and fragile successes (Hoving et al., 2010; Stirrat, 2006; Welling et al., 2010). If family science students can learn such lessons now, then they might be better prepared to enter social service professions upon graduation.

Discussion

In sum, the study revealed a combination of negatively and positively-valenced student reactions to participation in a SOGS activity. Students' comments addressed multiple elements of the TGF content along with group interaction processes. Since there can be disparities between instructors and students' viewpoints on HDFS courses (Allen & Farnsworth, 1993; Author, 2013), soliciting student feedback can be worthwhile. This solicitation does not need not be conducted in a formal manner such as research. However, the depth and breadth of feedback gathered from this study may indicate that students are willing to share reactions when instructors provide opportunities to do so.

Weaknesses and Strengths

Results of this study should be considered in the context of its empirical weaknesses and strengths. Parallel to previous studies (e.g., Walsh & Weiser, 2015), this study was limited to analysis of a single activity in a single course. Thus, there is no presumption that results are generalizable to other SOGS or student populations. The questionnaire also had limited space for responses to open-ended questions. The space was designed to foster more cogent responses (e.g., devoid of stream-of-consciousness rambling). However, this design resulted in responses that were less complex than those received using methodologies that allow long student narratives (Solheim, Zuiker & Levchenko, 2011). Finally, similar to other studies (Greder, Diers & Schnurr, 2010), the two authors engaged in various parts of the instructional process (e.g., SOGS and reading selection, lecture and activity supervision). Thus, it is unknown whether results would have been different had a single instructor fulfilled all tasks.

In reference to strengths, the authors used a specific questionnaire to assess students' reactions to engaging in a single teaching activity. This approach provided more detail than is generated from traditional sources, such as course evaluation forms. The use of a questionnaire also provided students greater anonymity than did other formats, such as face-to-face whole class

discussions (e.g., Allen & Farnsworth, 1993). This anonymity may have decreased the likelihood of socially desirable responses (perhaps evidenced by the clarity of negatively-valenced comments). Compared to some other studies (Walsh, Cromer, Park & Essa, 2012; Walsh & Weiser, 2015), this study had a larger sample. Data collection was also conducted one week after students completed the TGF activity. Given the intensity of this activity for some students (as noted by instructor observations and student comments), this timeframe may have allowed participants to engage in some emotional distance and reflection. Such reflection might have facilitated the clarity of their questionnaire responses. Students' comments also revealed that they made some connections between TGF and course concepts. Such connections can enhance the likelihood that students will complete coursework and degree requirements (Jacobson, Oravecz, Falk, & Osteen, 2011).

Future Research

There are some options for enhancing future research. First, a larger sample can be used. This sample can be generated from multiple sections of the same course in a single academic year or in several years (Solheim et al., 2011). Given the complexity of TGF, it may be possible to use this SOGS either in interdisciplinary courses or in single courses in multiple disciplines (e.g., health management, urban/rural planning, epidemiology, economics, political science). Generalizability would be also be enhanced by data collection across multiple locations. Second, multi-method measurements could be used. Questionnaire data can be supplemented with individual or group interviews. With their consent, it might be possible to observe or videotape group interactions while completing TGF. It is also possible that the use of multiple activity-specific questionnaires would help determine which scale provides the most accurate and meaningful data. Third, researchers can use multiple SOGS. This would not necessarily require all SOGS to have the same content, such as epidemic simulations. However, this enhancement might help identify which process elements (e.g., visual cues, tools, decision options) are most appealing or effective for students. Finally, it would be possible to conduct a longitudinal study. Such research would reveal what elements of the teaching activity students recalled and how their perceptions of the learning activity changed over time (Walsh et al., 2012).

Teaching Considerations

The authors are aware that other HDFS instructors might not teach general public policy courses, so they may decide that TGF would be a useless or irrelevant teaching tool. However, TGF could have value in addressing other HDFS issues. For example, TGF may be a useful exercise in entry-level career demands about client management (e.g., Fox et al., 2003). More specifically, TGF requires that players effectively monitor and respond to changing conditions in multiple locations. Locations vary considerably in their levels of functioning and length of their stability might be difficult to predict. These parameters align with conditions of multi-client caseloads. New and experienced professionals typically do not have the luxury of tending only to one client's needs at a time or of placing most clients on hold while tending to the needs of a caseload subset (i.e., one or a few clients). Thus, students may benefit from being placed in

situations where they can at least simulate these multi-client demands. As noted previously, TGF allows students to learn from their attempts and mistakes without harming others.

TGF can also be used to teach fundamental HDFS concepts. For example, parameters of TGF are well suited to delineating principles of Bronfenbrenner's ecological theory (Bronfenbrenner, 1979), social exchange theory (Hamrin, McCarthy, & Tyson, 2010), and stress theory (McCubbin & Patterson, 1983). Similarly, TGF might be a means to demonstrating challenges of any developmental or familial environment with supply-demand disparities. For example, the simulation's disparities may have some parallels to issues such as day care availability for families with employed parents, barriers to reunification for separated refugee families, adoption waiting lists, and quality of life conditions for low-income families (Eamon, 2001; Hollingsworth & Ruffin, 2002). Overall, TGF parameters appear to be a useful means to demonstrating resource management processes, which is a required content area for certified family life educators (NCFR, 2014).

It is important to note that instructors have gaming options beyond SOGS. Given the high degree of individuals' engagement in recreational games (Crawford & Gosling, 2009), it is possible to ask about students' (a) use of such games and (b) their capacity to link game elements and HDFS concepts. For example, Seery and Russo (2013) recommended using a SIMS game to demonstrate marital and familial concepts. Alternatively, instructors can use games featuring community building parameters to address changes in families' environments over time. This approach would have the advantage of building on students' extant knowledge and might help students to think more critically about social messaging within games they play.

In sum, SOGS are a resource available to HDFS instructors. Relevance to some HDFS concepts might not be immediately obvious, so it would be easy to dismiss the usefulness of games. However, instructors might find that recreational or serious games become valuable resources for facilitating students' knowledge and skill development.

Authors' Note

*It is estimated that 10% of students who completed TGF did not attend the next class meeting. This decline is common after other active teaching techniques in this course. No students reported that their absences resulted from TGF participation. Since students were not given advance notice that a questionnaire would be distributed during this meeting, there is no reason to think that their absence represented a decision to decline research participation.

Jacki Fitzpatrick is an Associate Professor in the department of Human Development and Family Studies at Texas Tech University, TX.

Erin Kostina-Ritchey obtained a Ph.D. in Human Development and Family Studies at Texas Tech University, TX and is a Certified Family Life Educator.

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