Student Responses to Switching to Online Nutritional Interventions During Pandemic in a Latin-American University

Jean Pierre Enriquez, MS
Graduate Department, Zamorano University

Adriana Hernandez Santana, DrPH
Human Nutrition Laboratory, Zamorano University

ABSTRACT

Background: Creating positive visions and attitudes in university students through educational interventions is challenging. Gamification-based programs can create an inclusive space where the student and trainer can strengthen learning in a dynamic process, which helps students find a mechanism that facilitates learning, and provides a useful way to comprehend academic content.
Aim: The aim of this study was to document the final experience of first-year university students on the adaptability to transition from in-person to online interventions from a program of nutritional and sustainability education through gamification concept theory.
Methods: This study reviews the results of the transition to online modality, due to COVID-19, of a nutritional education intervention with first-year university students (n = 85) from 16 countries in the Americas.
Results: The findings indicate that most of the students perceived improvement in their eating habits during the confinement period due to the information provided in the different sessions of the educational intervention.
Conclusions: Most students would have preferred that the intervention had been in person; however, they did not feel a sudden change due to the transition from face-to-face to online, demonstrating their resilience to the pandemic.

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BACKGROUND

Consumers play an essential role in setting consumption trends in the market, as many factors can influence their food choice (Enriquez & Archila-Godinez, 2021). University students represent a significant group for global consumption trends. Most students at the beginning of their university studies face new experiences in their food consumption and teaching about healthy diets could be a way to help guide them. However, healthy diets are not suitable for the environment when they do not come from sustainable production and use of resources (Corella et al., 2018). Thus, there is a need to advocate for agricultural and environmental sciences as majors for the future. Young

people from urban and rural areas should be encouraged to choose these programs to ultimately address the societal challenges of food production.

The start of a university education usually equates with increased independence for students. This can be the first time that students are responsible for their food consumption. Even when agricultural sciences require practical classes in the field, students can become vulnerable to malnutrition, sedentary lifestyles, and over-consumption (Blázquez et al., 2016; Woodhall-Melnik & Matheson, 2017). Efforts should be made for preventing these vulnerabilities at the beginning of university life. Sustainable development of such efforts should be multidimensional, i.e., balancing malnutrition, sedentary lifestyles, and over-consumption with society, the economy, and the environment (Rodríguez & Suazo, 2017). Natural resource conservation and reducing environmental impacts in food production is of the utmost importance.

The Food and Agriculture Organization of the United Nations (FAO, 2016) established sustainable agriculture as a tool to strengthen food and nutrition security in Latin America and the Caribbean by enhancing policies and practices to benefit agriculturally related sectors. In this context, sustainable diets will be a crucial component of public health and sustainable food systems. To achieve this, food systems must be transformed into sustainable patterns of consumption and production (Aranceta et al., 2016; Clark & Tilman, 2017). One way to achieve this is through educational interventions that link agricultural sciences, nutrition, and health with efficient use of resources. Formal education techniques such as gamification can involve students more closely in the learning process (Lázaro, 2019) and raise awareness.

Nevertheless, other factors influencing choice, consumption, and sustainable food production are global crises such as the current COVID-19 pandemic. Some have provided evidence of healthier habits during COVID-19 lockdowns (Rodriguez-Pérez et al. 2020) due to informative campaigns carried out worldwide. This pandemic provided an opportunity to migrate to sustainable and modern food systems (Galanakis, 2020). University students will face this new reality, so it is essential to support them in an adaptation process through the new modality of online education.

Nutritional interventions that interrelate gamification and involve students in evaluating and defining priorities and new consumption patterns can play a key role in improving public health and sustainable food systems outcomes.

Theoretical Framework

This study was guided by the gamification theory to highlight the importance of nutritional interventions. Gamification is defined as a learning technique that uses the dynamic of a game in the educational-professional field to achieve better results in educational interventions and share content between the research team and participants (Chau et al., 2018). Gamification is increasingly practiced as a learning instrument, as well as a way of understanding collaborative behaviors since students prefer engaged education over traditional teaching. This education process is delivered with three main components: (1) commitment, (2) experimentation, and (3) results (Werbach & Hunter, 2012). The COVID-19 pandemic has led to a migration towards online community nutrition programs, particularly via social media. Social media's three primary functions in online nutrition educational interventions are facilitating communications and peer relationships, supporting self-monitoring, and gamification.

Currently, this pedagogical field has been growing, with gamification used in teaching for three main purposes: (1) motivating action, (2) arousing learning, and (3) solving problems. In gamification, the evaluation and teaching

resources become a system in which participants engage in an abstract challenge determined by rules, interactivity, and feedback, generating a quantifiable result with an emotional reaction (Kapp, 2012).

According to Ivanovna (2013), the consolidation of the games' dynamics with the media gave origin to gamification. The unique characteristics of games include voluntary and free participation, an escape from reality into an imaginary world with codes and norms, and the opportunity to motivate the individual intrinsically. Therefore, educational gamification delivers attractive and novel learning opportunities to engage students (Lee & Hammer, 2011).

Young university students are a priority population for educational interventions due to their high prevalence of unhealthy eating behaviors, high risk of weight gain, and the importance of this stage of life in the development of eating habits and behaviors (Blázquez et al., 2016; Woodhall-Melnik & Matheson, 2017). These students will influence future trends in food consumption and production, and good consumption patterns are necessary to face the current problems in public health. Therefore, students are crucial since their behaviors are being formed at the university while they are becoming more independent.

Community nutrition pursues identifying and evaluating nutritional problems to design, organize, evaluate, and implement nutritional intervention programs (Aranceta et al., 2006). The interventions with a target group of people have the challenge of achieving a healthy nutritional profile over time (Aranceta, 2010) through activities to be carried out at a global level or with specific groups (Aranceta, 2013). In these interventions, first-year university students are an important group, because their vulnerability to social and public health problems increases since it is typically their first experience living outside of their household of origin.

Purpose and Objectives

The purpose of this study was to document the final experience as perceived by first-year university students from 16 countries across the Americas on the adaptability to transition from face-to-face to online interventions from a program of nutritional and sustainability education through gamification concept theory. The objectives of this study were to gather information on:

1. The impact of the information provided using gamification on improving student food consumption habits.
2. The importance of information received on consumer choice and trends after completing the interventions.
3. Student comfort and adaptability to interventions that switched from face-to-face to online modalities.

Methods

This study was descriptive in nature. Data came from a survey, conducted in May 2020, among a convenience sample of 85 first-year students at Zamorano University in Honduras. The students were an intervention group in a study about nutrition and sustainability in the transition to university life to create self-awareness in food choice decisions, and the sustainability of those choices, using the Mediterranean Diet (MD) as a framework healthy and sustainable diet (HSD) and lifestyle (Dernini et al., 2016). Students indicated their willingness to participate by signing an informed consent form after the study objectives were explained. The study protocol was approved by the Zamorano University Graduate Research Directorate. A critical realism lens was used to understand the reasons behind the success of nutritional intervention efforts as well as to

provide institutional policy recommendations for the implementation and establishment of similar interventions in the university.

An online survey was designed to elucidate the successful practices being undertaken by nutritional interventions in the context of evaluating the programming. The survey followed an appreciative evaluation approach (Christie, 2006), which consisted of seven multiple-choice questions related to the impact of educational interventions, the importance of the information received, and comfort and adaptability to the online transition. The survey also included one open-ended question where participants could add comments about a specific previous question, reframing evaluation through appreciative inquiry. Eight professional learning sessions through gamification bases supported this initiative: (1) Introduction: healthy habits promotion with emphasis on sustainable food choices; (2) What is a sustainable diet?; (3) HSD: as a preventive lifestyle; (4) HSD: health and nutrition benefits; (5) HSD: influence on food choice; (6) HSD: biodiversity and decreased environmental impact; (7) HSD: high socio-cultural food value; and (8) HSD: positive local economic benefits.

When the study was being planned, no one had considered the possibility of a global pandemic, so the first four sessions were delivered in person. Once the COVID-19 crisis arrived in Honduras, a two-week transition period to online programming took place, providing additional information to strengthen the topics already addressed, and promoting the potential platforms to be used to continue the study. The online platforms used to share content with students were social media (Facebook, WhatsApp, and Microsoft Teams) which included educational information, messages, reminders, surveys, and events related to HSD. It emphasized how consumers' good food choices can bring benefits to their health.

In the nutritional interventions, the games were used in informative notes, and trivia between each session using social media and visual content to keep the attention of the students. This allowed an exchange of ideas through conversation and feedback on each weekly topic.

RESULTS

The following sections provide a high-level summary of the key takeaways from the student discussions about the nutritional interventions. The following sections provide a clear and concise picture of the impact of nutrition education interventions on students from agricultural sciences, where they state their perspectives and viewpoints of the intervention.

Impact of Educational Interventions on Improving Eating Habits

At the time of COVID-19 confinement, 75.3% (n = 64) of students stated that there was a moderate improvement in their eating habits due to the knowledge acquired in the intervention, while 12.9% (n = 11) reported an extreme improvement.

On the other hand, only 11.8% of participants (n = 10) reported having had a mild improvement, very mild improvement, or no impact on improving their eating habits due to educational interventions using gamification. The participants also emphasized points of view about the sessions received. One said, "these talks are not only necessary for first year, I think that talks about healthy nutrition are necessary for all the years because it is notorious how in all years there is a disorder when choosing food."

Another participant mentioned, "The topics were of great help to changing decisions when choosing my food. The truth is that it is valuable information that should be shared with all future classes."

In general, participants did not express opinions of rejection or demerit towards talks about education, but most (91.8%) agreed that it is important that they be delivered at the beginning of the first year of university studies. A first attempt to face potential public health problems may start with the arrival of first-year students to campus, so they can manage their cultural, social, and healthy behaviors with helpful tools like these nutritional interventions.

Importance of the Information Received About Consumption Choices and Trends Post-Intervention

After the intervention, students were asked, "After receiving information about HSD, how important is it now (in time of confinement by COVID-19) the information when choosing your food (portions, place of production, seasonality, production chain)?" Around 68.2% (n = 58) mentioned that it was important to have received such information, while 25.9% (n = 22) said it was extremely important. No participants considered it to be unimportant. This illustrates that even when little importance is perceived by the students, there is an opportunity to enhance a positive effect on them with complementary interventions. One participant stated, "The disinterest of some students was of little help," perceiving that those who considered the minor interventions need to become more aware of topics that encourage them into better lifestyles.

Other participants shared, "The talks given created a new facet of improvement in personal food consumption" and "I would like more awareness talks in general, as it is a matter of great importance.".

In general, positive contributions were made by participants. One of the most positive statements linking the information received to the field of agriculture was, "It was very interesting and important to learn about how to take care of our health through nutrition and also help to take into account certain factors that are very important to know since we will be future producers." One student remarked that they liked the project as "it helped us [participants] to see everything we can consume and the right way to do it, the project even helped to know the food production process."

Comfort and Adaptability in the Transition to Online Modality

When questions about moving from face-to-face to online modality were asked, 88.2% (n = 75) mentioned that they felt more comfortable during an in-person intervention. Similarly, 87.1% (n = 74) felt that when sharing information, there was a greater dynamism and interaction with their peers and the researcher in the face-to-face modality; however, in the end, they managed to adapt to the online modality.

It is important to mention that 61.2% (n = 52) of students stated that the modality change only slightly impacted the dynamism and exchange of information after transitioning to online learning. In comparison, 17.6% (n = 18) mentioned that no change was perceived in the dynamism and exchange of information.

One participant stated, "I liked it and learned a lot; I feel that it was better in the virtual mode because you can concentrate more since in person you get distracted being with friends."

Other students mentioned:

> "Basically I had never had training about the correct way to eat, the talks helped me to expand the way I see how the country or communities can be supported by consuming the right food and, more importantly,

> improving my health…I believe that it is an issue that falls to us not only as consumers but also as future producers because not only the impact of an HSD was showed in our consumption, but also the environmental impact when producing and transporting food, and how can we reduce the impact with small actions".

Even with the online model, students assimilated the current situation and could apply what they had learned and even visualize that practicality in the future.

Conclusion

Efforts to deliver educational interventions that strengthen knowledge, such as agricultural sciences students' health, were not stopped due to the COVID-19 pandemic. Conversely, the interventions were transformed to be more accessible to participants without losing the principle of gamification to make the process of learning and interaction more beneficial. However, COVID-19 brought a series of events and situations that limited peoples' physical coexistence and generated a new reality where most activities are being carried out by telework and even classes delivered online.

A positive perspective from the students at the end of the educational intervention was obtained even though most would have preferred to receive it entirely in person. This showed a level of understanding and maturity in facing the pandemic and a willingness to receive information that could improve their eating habits through this crisis. This study overcame the usual barrier in education using gamification to motivate students to have a persistent commitment in the long term (Ibáñez, 2016).

Educational programs should be developed to integrate agricultural value chains from the farm and beyond the table with nutrition. Through gamification techniques and sustainability principles, students may be able to integrate broader knowledge that can be interrelated, and that can address COVID-19 limitations. The educational models of gamification should be designed beforehand and learning objectives to evaluate the educational intervention should be made at the end using student input (García-Lázaro & Gallardo-López, 2018).

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Address author correspondence to:
Name: Jean Pierre Enriquez
Email: jean.enriquez.2018@alumni.zamorano.edu

Author's Note
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