To Infinity and Beyond—Gamifying IT Service-Desk Training: A Case Study

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The Information & Technology Services Department at a mid-sized comprehensive university in the Midwest identified a need for a more engaging onboarding training module that emphasized basic technology skills and customer service skills. A gamification strategy was developed to increase employee motivation and provide a more thorough onboarding experience. This strategy included digital and physical leaderboards, leveling up, and bonus prizes and challenges tied together by a space exploration theme. Results from the qualitative feedback indicate that the training program design was well-received by participants, meeting Level 1 of Kirkpatrick's Evaluation Scale. Additional comparison results of two years' of annual campus surveys indicate that the gamification training strategy had some positive impact on customer satisfaction with the performance of the IT Service Desk.

Gamification strategies have seeped into the everyday lives of many people. For example, loyalty cards, applications, and rewards programs continue to integrate game strategies into their structures to motivate and encourage competition. It is only natural, then, that in a work environment filled with employees who have likely grown up exposed to video games, sports, and board games, gamification strategies are being implemented in training initiatives (Malikaveetil, 2015; Prakash & Rao, 2015).

Gamification is the application of game techniques and strategies to a process or environment that is typically non-gaming, like shopping, exercising, or teaching and learning (Kapp, 2012). Techniques such as the use of leaderboards (scoreboards indicating where a participant falls in relation to other participants), leveling up (increase in a pre-defined rank as points are earned), badges, quests, and hidden challenges are all examples of gaming elements that can be incorporated into a work or training environment (Deterding, Sicart, Nacke, O'Hara, & Dixon, 2011). Leaderboards act as a visual representation of rank relative to other participants in the gamified system. The goal of rising in rankings may serve as a potential motivator for some to continue while providing others an opportunity to recognize potential areas for improvement.

Retention, employee engagement, and socialization of incoming employees are large concerns for almost any organization (Allen & Shanock, 2013; Hanaysha, 2016; Klein & Weaver, 2000). Research surrounding the most effective design of new-hire training is relatively sparse; however, some studies have shown that new-hire training programs are an integral part of the socialization (e.g., mixing socially with others) of new employees (Allen & Shanock, 2013; Klein & Weaver, 2000). When new hires experience socialization, it helps them adapt to their new job responsibilities,

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form connections with other employees, and develop both task mastery and organizational commitment (Allen & Shanock, 2013).

Combining the two strategies—gamification and new-hire orientation—would seem to be a natural way to introduce new hires to their job in a way that is engaging and meaningful while allowing them to become socialized in their new work environment (Malikaveetil, 2015; Prakash & Rao, 2015). This socialization and skill training will, in turn, ideally lead to higher levels of customer satisfaction with the service provided by these employees. Socialization of new employees can lead to higher retention and reduced training costs in addition to the increase in job expertise as longer-term employees build upon their knowledge base (Allen & Shanock, 2013; Hanaysha, 2016; Klein & Weaver, 2000). Higher skilled, more dedicated employees will hopefully provide improved customer service, leading to increased customer satisfaction. Studies have shown that increased levels of customer satisfaction ultimately lead to increased revenue for the organization (Terpstra, Kuijlen, & Sijtsma, 2011; Winkler & Schwaiger, 2004).

In an effort to provide an engaging onboarding training experience as well as an introduction to the basic technology skills needed for a customer-service position within an IT department, the ADDIE process of instructional design was followed to develop and implement a gamified IT service-desk training. ADDIE is a systematic instructional design process that stands for Analysis, Design, Development, Implementation, and Evaluation (Molenda, 2003).

The goal of this training project was to increase employee retention and customer satisfaction, both of which are concerns for the organization in question. An evaluation of the training effectiveness was planned to determine whether the training met any levels of the Kirkpatrick Evaluation Framework (2005) by

- Engaging new-hire employees in their new roles within the IT department.
- Socializing new employees and helping them feel connected within the IT department.
- Providing basic IT service-desk skill training.
- Increasing the overall satisfaction with the customer service provided by the IT service desk.

Analysis

At a medium-sized, public, comprehensive (in the Carnegie Classification) university in the Midwest, inconsistent new-hire training had become a serious hindrance to the quality and level of customer service at the information and technologies (IT) service desk. Studies have shown that service-desk performance issues such as low customer-service skills, lack of troubleshooting ability, and misuse of the department's ticketing system, can lead to negative perceptions of the department by customers (Feinberg, Kim, Hokama, & Ruyter, 2000; Heckman & Guskey, 1998; Siti-Nabiha, Thum, &

Sardana, 2012). Although informal training modules existed for the IT organization examined in this study, there was a significant lack of engagement and accountability for participation and completion. This lack of engagement and accountability was likely due to several underlying factors.

While training had been requested, the trainees perceived it as work beyond what they were being paid to do and not a professional-development opportunity that could enrich their positions. In addition, priority and time was not allotted for training by the management team. Through department employee feedback, management concluded that efforts should be made to create a formalized new-hire training process to orient new employees and provide them with valuable information about university and department policies. After the initial formalization of the new-hire training process, it was clear that there was a need for a solution that went beyond introducing employees to the university. Specifically, training was needed that would give all new department employees an overview of basic tasks, systems, and expectations that most if not all department employees were expected to know. Three areas of focus were defined for a new-hire training beta test that would be rolled out to all incoming new hires as well as all current IT service-desk employees. The ticketing system and IT-specific technology, technology troubleshooting, and device-repair training were the three topics identified as the highest immediate training needs by the IT management team.

The goal was to find a strategy that would motivate employees, encourage excitement about the training process, and allow them to visualize their progress. The development team wanted to create a training system with goals and rewards for learning that would instill a sense of pride in an employee's accomplishments while creating a healthy culture of competition that would facilitate a sense of organizational commitment and employee empowerment (Hanaysha, 2016). A gamification strategy seemed to be the best fit with the needs of the department. Landers and Armstrong (2015) noted that gamification strategies benefit employee training when participants have a positive attitude towards technology and some personal experience with gaming. This made the IT service-desk personnel ideal candidates for testing a gamification training strategy; largely in part due to their aptitude for technology and their advanced technology-related problem-solving capabilities. In addition, many of the IT personnel, on several previous occasions, had endorsed personal interest and engagement in gaming in general. Following the Landers and Armstrong (2015) model, IT personnel in this organization made a gamification beta test a logical solution.

From the analysis of the performance need a set of training goals was established. For IT service-desk employees, a training would be created that used gamification strategies to engage learners. The goals of this training program were

- Introducing new hires to the university and the IT department
- Providing basic task-related job information for trainees
- Emphasizing the importance of customer service in all areas of the department

- Encouraging new hires to socialize and meet other department employees to build a sense of community
- Introducing new hires to university- and department-specific technology tools

Design and Development

The use of games, game strategies, and simulations in learning environments is not new. In fact, the use of gamification in education has been gaining increased attention in recent years. Models of gamification of new-hire onboarding include the introduction of games based on real games, such as the Amazing Race (Malikaveetil, 2015); the use of a gamified training model called Google Apps Jedi Academy (Grundy & Belskie, 2015); the implementation of badging as a reward (Kamasheva, Valeev, Yagudin, & Maksimova, 2015); and the creation of a virtual office, city, or location for potential and new employees to explore (Oridioni, 2013).

Inspired by the success of the gamified Google Apps Jedi Academy developed by the IT department at the University of Notre Dame (Grundy & Belskie, 2015), a small group of IT-department employees at the medium-sized, public, comprehensive university undertook the task of building a gamified learning environment for a beta test of new-hire training. The design team consisted of a knowledge systems architect, an instructional designer, and two team leads from the IT service desk. A knowledge systems architect oversees the planning, creation, and archiving of information within the department and provides the content knowledge for the new-hire training. An instructional designer was present to consult on the format of the training. The IT service-desk team leads acted as both subject-matter experts during the design phase and trainers during the implementation phase. The beta test was planned for use with IT service-desk student and staff employees, with plans for revision and expansion to the remaining IT department staff. The learning management system (LMS) Brightspace by Desire2Learn (D2L) was used as the platform for the beta test. No additional software tools were used other than Camtasia Relay for screen capture of the instructional videos, Microsoft Excel Online for qualitative data collection, and the Microsoft Video app for hosting the videos.

Any good game has an engaging storyline. Consequently, the team began by developing a story that would provide both the context of the narrative and elicit motivation from learners following the model for content gamification (Kapp, 2012). Kapp (2012) describes content gamification as the addition of gaming elements to the curriculum as a whole, rather than adding game elements to the physical process of progressing through the content (structural gamification). While several gamification story scenarios were considered and rejected, ultimately the team decided upon a storyline that would give the participants a context for completing the activities in the training while maintaining the integrity of the "game."

In order to integrate technology, technology troubleshooting, and device-repair training, a space-exploration theme was chosen for the gamification strategy. The space theme would give participants a reason for working on the technology and provide a story for the game that included the mechanics of moving forward toward an end goal in a way that other possible themes (e.g., a wagon journey during the gold rush) could not. The space-exploration theme allowed the development team to integrate the technology skills with the need to have a forward progression through the material. Participants would navigate through the training as though they were preparing to join a mission to explore the galaxy as crew members. All training scenarios were developed around this theme. For example, as participants entered the customer-service training module, they were introduced with the following statement:

In order to integrate technology, technology troubleshooting, and device-repair training, a space-exploration theme was chosen for the gamification strategy. Participants would move through the training as if they were preparing to join a mission to explore the galaxy as crew members.

> "As part of your cadet duties, you will be expected to support the mission crew with all their technical needs. The mission and shuttle crews have diverse backgrounds and expertise, but they all have one thing in common—they sometimes need a little technical help. Your first job, as cadets, is to support the crew members in getting their devices mission ready."

This beta test was called Space Camp, and new hires and IT service-desk staff participants initially entered the training as "recruits," leveling up to "cadets" after the introduction of the module using a leaderboard tool. Throughout the brainstorming sessions, several points of concern were raised regarding the story and ranking issues. First, it was important that the story be generic enough to engage most employees without playing into a pop-culture fad that would quickly become dated. Second, there were concerns from our shared governance units that the language surrounding the ranking system should be sensitive enough to ensure that participants did not consider them to be derogatory or patronizing. Terms such as *Noob*, *Rookie*, or *Grand Master* had to be avoided, although these terms are generally used and widely recognized in commercial games. For this game, the following ranking system was defined, from entry level to highest level:

1. Recruit
2. Cadet
3. Crew member
4. Payload specialist
5. Staff sergeant
6. Lieutenant

Participants were asked to create a unique persona, an online alternative identity to preserve anonymity, that would be used for both digital

and physical leaderboards. These leaderboards are running scoreboards that are displayed both in the course and in the service-desk environment, displaying the progress of course participants at any given time. The digital leaderboard was an Excel spreadsheet maintained by the IT service-desk team leads and displayed on the course home page within the learning management system (see Figure 1). The physical leaderboard was a bulletin board posted behind the IT service desk featuring space ships with each persona name (see Figure 2). The team leads moved each space ship to indicate progress within the course according to points earned by each participant. Leaderboards in gamification strategies function much like scoring brackets in a golf tournament.

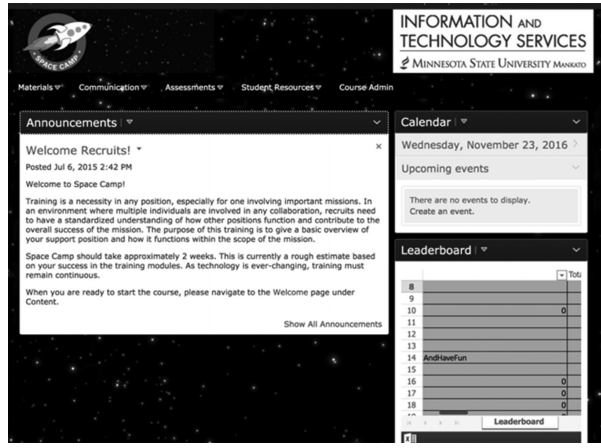


FIGURE 1. HOME PAGE OF SPACE-CAMP TRAINING WITH SPACE THEME AND DIGITAL LEADERBOARD

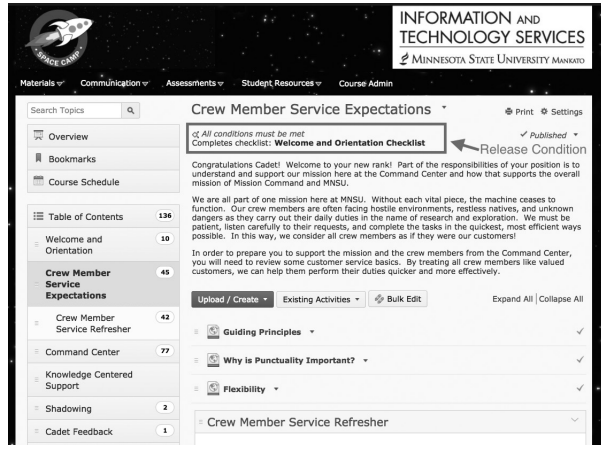


FIGURE 2. RELEASE-CONDITIONS EXAMPLE IN D2L BRIGHTSPACE

As "players" earn points, they move positions on the leaderboard above or below the other participants. In this specific design case, leaderboards are used as visual displays of progress in comparison to other participants. Some studies have found that leaderboards can be demotivating to those students who do not enjoy the competitive aspect of games or for whom a large gap in participant placement on a leaderboard would be distressing (Buckley & Doyle, 2014; Deterding, 2012; Woods & Reiners, 2015). Additional evidence exists to support the use of leaderboards in combination with other game elements as one motivator among many motivating game elements (Kapp, 2012; Sailer, Hense, Mandl, & Klevers, 2013; Seaboard, Pennefather, & Fels, 2013).

Rewards and achievement recognition were also built into the structure of the course. Achievement recognition is a salient component of gamified pedagogy, wherein participants can earn badges, certificates, or other tokens (i.e., rewards) upon demonstrating competency in a particular subject, which has shown to lead to increased motivation and self-efficacy (Deterding, Sicart, Nacke, O'Hara, & Dixon, 2011). Due to restrictions placed on employee prizes, gifts, and other rewards by the bargaining units, Milky Way candy bars and Space-Ship key chains were donated by the project team as achievement rewards. Certificates for these rewards were hidden in the course, using specific tools within the learning-management system (Intelligent Agents and Release Conditions). The certificates were automatically delivered after a participant triggered the delivery by completing a series of tasks, scoring well on a quiz, accessing specific content, or conducting a role-play scenario with a team lead. These certificates could then be traded in for the reward of their choice. The course-shell background in D2L was modified with a space theme, and a graphic-design student created a Space-Camp logo for the home page.

A current service-desk employee created a "welcome message" for the cadets, using a voice-over and space-themed slide show. Various hidden rewards and achievements were embedded within the Space-Camp modules. These rewards and achievements included but were not limited to Milky Way candy bars, space-themed key chains, and advancement of their persona on the leaderboards. Some of the primary gamification elements that were included in Space Camp were

- A physical and digital leaderboard (see Figures 1 and 5)
- Easter-egg items (hidden challenges and/or rewards)
- Leveling up through the earning of experience points
- Integration of the space-exploration theme throughout tasks and activities

To immerse participants in the game story, the vocabulary of the training had to be changed to align with the gamification theme. Examples of the vocabulary changes are seen in Table 1, which follows.

TABLE 1	EXAMPLES OF IT-DEPARTMENT VOCABULARY CHANGES THAT ALIGNED WITH THE GAMIFICATION STORY
IT-DEPARTMENT TERM	**SPACE-CAMP TERM**
New Hire	Recruit
Current IT Employees	Crew Members
IT Service-Desk Team Lead	Mission Commanders
IT Department	Mission Command
IT Service Desk	Command Center
IT Service-Desk Manager	The Captain

As participants enter into the training course, they are greeted by the following welcome message and opening presentation explaining their "mission" as "recruits" in Space Camp:

> "Welcome Recruits! You have been chosen from an elite group to complete an exploration of our Galaxy! This mission is vital to expand our knowledge of our solar system and beyond. Your mission launches in a few short weeks, so we need you to get ready and *boldly go where no one has gone before!* The first step in your journey is Space Camp. During the camp, we train you on everything you need to know to have a successful mission. You will learn about how the ship works, how to troubleshoot issues, and how to interact with the crew and other personnel that you will encounter. Make no mistake, Space Camp requires you to be at your best at all times. Be fearless! Be creative! But most of all, be attentive to your mission commanders and their instructions, both of which will be absolutely imperative to pass Space Camp and graduate to become a part of the Mission Crew before launch time."

The gamified training course included the following modules for participants to complete:

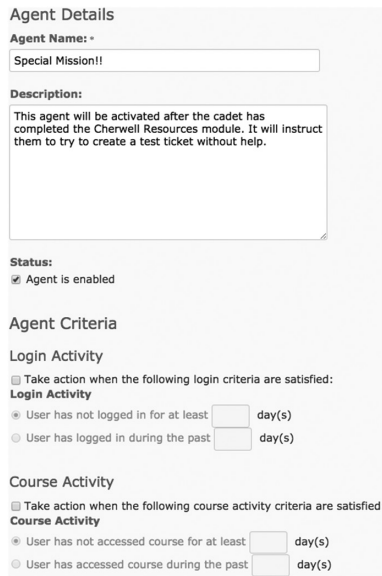
- Welcome and Orientation
- Crew-Member Expectations
- Command Center
- Knowledge-Centered Support
- Shadowing
- Cadet Feedback
- Graduation

These modules were set up using D2L's Release Conditions feature, meaning that participants must complete a specific task in one module before the subsequent module would become visible and unlocked for them to explore. An example of a Release Condition can be seen in Figure 2.

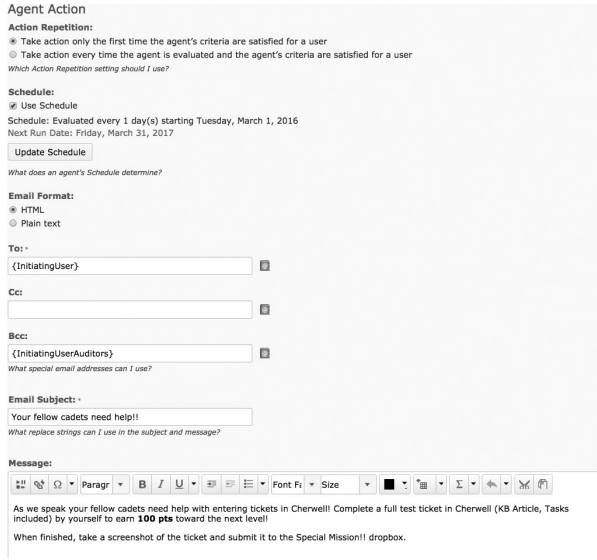
The tasks required to unlock each module vary from module to module depending on the type and amount of content. The content is presented in video and text form, and participants are assessed using a combination of auto-graded quizzes, reflection surveys, and various role-play scenarios conducted by the team leads.

Hidden challenges and "Easter Eggs" are included in the gamified training course. Using the Intelligent Agent tool in D2L, which allows automated emails to be created and sent based on specific triggers within the course (see Figures 3 and 4), emails were created that were automatically sent to participants upon completion of a designated Space-Camp task. These emails are attached at random to tasks in order to present challenges and rewards to participants at varying times throughout the game. Additional automated emails are generated when the participant receives enough experience points (XP) to level up. An example of one of the challenges that is sent after participants complete the module on customer service is

> Subject: Help a fellow angry cadet.
>
> One of your fellow cadets on the space station is getting visibly frustrated with another cadet. You know that if this cadet gets angry, they may get into big trouble with your commanding officer. Use what you've learned in the topic, What to Do When You Feel Yourself Becoming Angry with a Customer, to diffuse the situation.
>
> Completing this task with earn you up to **200 pts** or a **space pin**
>
> When finished, please submit your completed work to the Angry Cadet dropbox.



FIGURES 3. INTELLIGENT AGENT AUTOMATED EMAILS



FIGURES 4. INTELLIGENT AGENT AUTOMATED EMAILS

FIGURE 5. PHYSICAL LEADERBOARD FOR SPACE-CAMP TRAINING MODULE

Participants finish the gamified training after completing all modules and assessments. They receive a certificate of completion and a promotion to one of the ranks on the leaderboards based on the amount of XP that they earn during the training (see Figures 1 and 5).

Implementation and Evaluation

During the Spring 2016 academic semester, all IT service-desk employees completed the beta test of the Space-Came training module. Additionally, all subsequent new hires throughout the department were asked to complete the Space-Camp training. All current IT employees are enrolled in the training, but it is not a job requirement to complete the training modules at this time based on management feedback.

The Kirkpatrick Four-Level Model is often used to evaluate the effectiveness of training based on a framework that includes participants'

reactions, the amount of learning that occurred, the ability to apply what was learned, and the degree to which training outcomes were reached (Kirkpatrick & Kirkpatrick, 2005). The qualitative feedback on the 27 participants' experiences was collected and used for revision and expansion of the current iteration of the training, using an anonymous online survey created with the Excel Online Survey tool. The survey was embedded into the final module of the course within the learning management system. Participants were asked to provide their opinions or suggestions on the following open-ended questions regarding their experience with the Space-Camp onboarding process:

- What did you like most about Space Camp?
- What improvements could be made to Space Camp?
- Is there any information you felt should be included in the onboarding modules?
- Is there any information you feel should be eliminated from the onboarding modules?

Qualitative results were coded and analyzed manually by the researchers because no qualitative analytic software was available to the team. Participants' open-ended responses were analyzed by the investigators using a comparative analysis; specifically, investigators familiarized themselves with the responses to four open-ended questions. Participants reread the questions multiple times to immerse themselves in the data (and the sample as a whole) and to identify any overarching themes or ideas. Responses were categorized into themes based on the aspect of the training the comment referenced. For example, responses such as "add practice tasks rather than quizzes" were categorized into a general "too many quizzes" theme. Themes identified among the investigators were then compared, analyzed, and finalized based on consensus. Additionally, themes or ideas stemming from the open-ended questions will be used when developing a revised Space Camp. The qualitative data was then used to determine at which level of the Kirkpatrick framework, if any, the training was successful.

In an effort to determine whether or not the Space-Camp course was beneficial to customer satisfaction of the IT service-desk support, outcome data were collected and compared from an annual, campus-wide IT evaluation survey for the academic years of 2015–2016 and 2016–2017. Shortly before IT service-desk staff participated in the Space-Camp course, the annual 2015–2016 IT survey was disseminated to all faculty, staff, and students located at the university. The IT survey consisted of a variety of academic-technology related topics; however, only a series of questions assessing levels of agreement (5-point Likert scale where 1 = *strongly disagree* and 5 = *strongly agree*) with various responsibilities of the service-desk staff were chosen at performance-outcome measures, which include: Overall Satisfaction, Response, Problem-Solving, Staff, and Keeping Customers Updated. Agreement levels were obtained by

identifying the prevalence of participants who reported either that they *agree* or *strongly agree* with the respective service-desk outcome variable. Satisfaction ratings emanating from the five outcome variables were compared between the 2015–2016 and 2016–2017 IT evaluation surveys to determine the impact (if any) Space-Camp training had on the quality of assistance or help provided by the IT service-desk employees.

Results

Attitudinal Feedback

A total of 27 participants took part in the Space-Camp gamification modules during the beta test. All participants completed Space Camp asynchronously with an enforced two-week completion deadline and submitted an anonymous, online post-experience survey after completing all modules. During the beta testing, nearly all participants followed the directions for achievement and recognition, requesting the rewards that were indicated in each challenge. From the three survey questions listed in Table 2, participants' experiences were overwhelmingly positive. A vast majority (96%) of participants indicated that Space Camp provided them with tools useful for their respective positions, that gamification made their experience fun and engaging, and finally, participants felt that they had ample opportunity to ask questions and receive feedback.

The responses from each open-ended question were analyzed for reccurring themes and/or ideas. Open-ended questions and their corresponding themes are illustrated in Table 3, which follows. A total of three themes emanated from Question 1, which suggests that participants found Space Camp to be "engaging," "easy to follow," and "informative." One participant stated that "It [the training] is full of information that helps us understand different methods step by step. Information on Cherwell was really helpful and I learnt a lot."

A total of three themes emanated from Question 2, which suggests that participants experienced "video problems," and wished that "work-related issues" were a part of the Space Camp; finally, many felt that "no improvements" were needed. A total of three themes emanated from Question 3, which suggests that participants would like "new-employee expectations" to be stated during Space Camp and that there was "more

TABLE 2 OUTCOME MEASURES WITH FREQUENCY DATA

QUESTIONS	YES	NO
1. Do you feel that the Space-Camp onboarding process gave you the tools you need to perform your job?	26	1
2. Do you feel that the gamification of the onboarding made it fun and engaging for you?	19	8
3. Do you feel that you had ample opportunities to ask questions and receive feedback from your team leader or mentor?	27	0

TABLE 3 IDENTIFIED THEMES FROM PARTICIPANT RESPONSES

OPEN-ENDED QUESTION	THEMES OR IDEAS
1. What did you like most about Space Camp?	• Engaging • Easy to follow • Informative
2. What improvements can be made to Space Camp?	• Video problems • Include work-related issues • No improvements
3. Is there any information you felt should be included in the onboarding process?	• Include expectations of new employees • More detail • No additional information
4. Is there any additional information you feel should be eliminated from the onboarding modules?	• Too many quizzes • Not at this time

TABLE 4 ACADEMIC-YEAR COMPARISONS FOR SERVICE-DESK PERFORMANCE

	ACADEMIC YEAR	
OUTCOME VARIABLES	2015–2016 (STUDENTS: *N* = 119) (FACULTY: *N* = 70) (STAFF: *N* = 20)	2016–2017 (STUDENTS: *N* = 89) (FACULTY: *N* = 79) (STAFF: *N* = 105)
Overall Satisfaction	67%	58%
Response	70%	75%
Problem Solving	64%	65%
Professional Staff	78%	83%
Keeping Customers Updated	57%	54%

Note: Each outcome variable was measured in terms of the prevalence of participants reporting that they either *agree* or *strongly agree* with a specific outcome variable. Outcome-variable ratings were placed on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

detail" in certain modules; finally, many felt that "no additional information" was needed. Responses from Question 4 produced a total of two themes, which were best characterized as "too many quizzes," and "no information needed to be eliminated at this time."

Service-Desk Performance Outcome

Comparison data of 2015–2016 and 2016–2017 service-desk performance is provided in Table 4, which follows. Of the 925 participants who took part in the 2015–2016 ITS survey, 209 provided responses for the targeted service-desk portion of the survey. Similarly, only 273 of the 661 participants who took part in the 2016–2017 ITS survey provided responses to those same questions. As can be seen, there is an increase

across all service-desk domains except Overall Satisfaction and Keeping Customers Updated as compared with the 2015–2016 survey.

Discussion

Based on the results of the attitudinal survey, the beta test appears to have been successful at engaging the new hires and providing a positive orientation to those new to the IT department, which meets Level 1 of the Kirkpatrick Evaluation model. The participants did find the training useful and enjoyable and were satisfied with their interactions with their team leads (Russ-Eft & Preskill, 2001). The majority of the participants found the training to be helpful and engaging, which supports the assertions made by Allen and Shanock (2013) regarding the importance of new-hire training. Most notably, 100% of the participants indicated that they had more than enough opportunity to interact with their mentor and/or team lead. One of the goals of this project was to increase the socialization of new hires while orienting them to their new job duties. In this view, the project of creating a gamified new-hire training course would seem to have been successful.

Most notably, 100% of the participants indicated that they had more than enough opportunity to interact with their mentor and/or team lead.

Based on participant feedback, revisions to the content were suggested, such as reducing the amount of quizzes and video training. As a result of the early-participant feedback regarding "video problems" in response to Question 2, the design team discovered a challenge with the video hosting application that was being used. The privacy settings on the uploaded training videos did not allow participants to view the videos until they were individually given permission within the video hosting app. This issue was solved early in the beta test, and subsequent participants did not have this challenge. Also, some open-ended responses needed further detailed follow-up, such as the suggestion to include "work-related issues." Whether this refers to specific job tasks for individual employees or to more administrative issues, such as submitting time cards, or relating to employee dress code is unknown at this time.

A second and larger goal of the program was to help improve the level of customer service at the IT service desk, which would address Level 3 of the Kirkpatrick framework—Behavior (Kirkpatrick & Kirkpatrick, 2005). This level indicates whether trainees are able to apply what they had learned outside of the training environment. A comparison of the results of the two annual IT Customer Satisfaction surveys would seem to indicate that despite the positive results of the attitudinal surveys, a comparison of the initial results of the ITS Customer Satisfaction Survey from the current year to the previous year indicate that a decrease in overall satisfaction in employee performance occurred after the implementation of the Space-Camp training. This supports the assertions of Russ-Eft and

Preskill (2001), who caution that success at Level 1 of the Kirkpatrick model does not necessarily lead to success at subsequent models.

In addition, favorable attitudes towards the training do not necessarily lead to positive learning gains. For the overall satisfaction outcome area, the results for the 2017 survey indicate that customers were less satisfied than in the previous year. However, positive gains were seen in the domains of Response Time, Problem-Solving, and Professional (Courteous, Polite, Knowledgeable) Staff. These specific domains would seem to indicate at least partial competence at Level 3 of the Kirkpatrick model—Behavior. Arguably, we can see the results indicating positive outcomes at Level 4—Results, given that at least some of the training goals were met. The new hires were introduced to the department and university and the attitudinal data reflect the usefulness of the training in both this aspect and in encouraging them to build a community of their peers through mentoring and team interaction. The increase in the Response Time, Problem-Solving, and Customer-Service domains would seem to indicate that the training was indeed useful in providing basic task-related job information for the trainees as well as in emphasizing the importance of customer service and familiarizing the trainees with the specific technology tools needed to do their job.

While there were many other changes to the IT department as a unit (the appointment of a new chief information officer; the relocation of the IT service desk to another part of the university; a large turnover in IT service-desk staff; and a complete reorganization and rebranding of the department) that could have impacted the overall satisfaction levels reflected in the survey results, the researchers must conclude that the gamification strategy did positively affect the performance of the IT service-desk employees who completed the beta test of the training. Indeed, there is some evidence to suggest that the content of the training program, which included a lengthy module on customer service, affected the level of customer satisfaction in a positive manner in at least the domains of Response Time, Problem-Solving, and Professional Staff. It would appear from the study results that the content was adequate at creating a learning environment that provided adequate practice for the customer-service skills, troubleshooting ability, and correct use of the department's ticketing system that Siti-Nabiha, Thum, and Sardana (2012) state are necessary to form positive perceptions of the department by customers.

Conclusion

While the initial results of this case study would appear to be both positive and negative, some caution should be taken when interpreting the results of this study. First and foremost, the current study aimed to identify themes stemming from participants' open-ended responses based on their experience with the Space Camp. As a result, analyzing and interpreting qualitative outcomes can be a fairly subjective process,

which makes generalizing results to other populations (e.g., service-desk members at other post-secondary institutions) challenging. Second, this study was preliminary, which made it difficult to determine which, if any, of the specific components of the Space Camp training had an impact on participant experience (i.e., there is no comparison data). Investigators recognize the importance of conducting a component analysis, as doing so certainly provides vital information regarding intervention design and outcome; however, results from the current study are preliminary and will be considered for future Space-Camp training modules where additional resources will allow for a more thorough assessment of the study's components. A final consideration when interpreting these results includes the technical-skill level of the participant population. The participants were employees in an IT department, hired because of their proficiency or aptitude with technology. As such, the training modules were designed for participants with a higher-than-average technical-skill level. It is possible that the gamification strategies or the specific content would have actually been demotivating to participants who were not proficient or comfortable with technology. Applying the same strategies to scenarios outside of IT settings should be done with this in mind.

Attempting to understand the phenomenon of individual experience can be an expensive and scrupulous process that should be approached with a host of detailed qualitative questions. The questionnaire was limited by the amount of open-ended questions, which may have limited the ability to accurately capture the overall experiences of participants. However, the study did demonstrate that the specific participant pool found Space Camp was useful for their careers, was engaging, and elicited positive overarching themes from participant open-ended responses.

A comparison of the results of the ITS Customer Satisfaction surveys would seem to indicate that the gamified training course had some impact on the level of customer satisfaction, despite the decrease in the overall satisfaction rating when it was compared across survey years. However, it is also possible that the 2015–2016 survey results are higher than the following year's because that is the year when a concerted effort was made to train and engage IT service-desk employees with the beta test of Space Camp. It is also possible that the departmental changes as a whole affected the overall customer-satisfaction rating, and the individual components of the survey related directly to the IT service desk accurately reflect the one-on-one interaction that each customer had with the individual employee. Further research studies into the efficacy of the gamified training model's impact on customer satisfaction would be useful, particularly if a comparison could be made to a similar institution not using a gamified model or archival data from earlier ITS Customer Satisfaction surveys could be analyzed to determine levels of customer satisfaction prior to both implementation of the training program and prior to the major departmental changes that took place in between the 2015–2016 and 2016–2017 surveys.

Extensive revisions to the Space-Camp training are being conducted based on the results of both the attitudinal feedback and the ITS Customer Satisfaction surveys. Outside experts in industrial and organizational psychology will consult on the revision and expansion of the programming. Additional consultants have been contacted to solidify the "game story" and to provide expertise in game mechanics. In an effort to maintain quality, theme, and participation, the Space-Camp theme will continue for future modules. Each new content area will be a move further out into "space" as participants explore new "galaxies." Each galaxy will consist of various planets which would be specifically themed to each topic within a content module. Once a theme has been mastered and the planet has been passed, participants will receive a completion badge(s).

In addition to training new employees and student employees in each of the functional units within the IT department, the development team determined that the training modules could also serve as professional development for both current student and staff employees. By identifying what employees are good at; training them in the tools, processes, and procedures of the organization; and aligning this with what employees actually enjoy doing, both the employee and the organization have a better chance at realizing the organization's goals (Jawahar, 2012).

Outside of IT, other departments throughout the institution have expressed interest in the work that has been done with the Space-Camp module. The original gamification-development team intends to work with the other departments to provide aid and to work to build a more unified onboarding process, utilizing the lessons learned through the Space-Camp module.

Future Research

Areas for future research include empirical studies of the training intervention, using a pre–post model or by triangulating the data with observational protocols and document analyses. Longitudinal studies may provide researchers with valuable information regarding the potential impact of the training model on information transfer and retention. Additional customer-satisfaction surveys given at the time of service would provide additional information on the effectiveness of the training on improving the level of service. Moreover, employee-satisfaction surveys combined with retention data would speak to the impact of the training on the employees' organizational commitment. A control-group study with participants who were selected as not technically proficient would provide valuable data on the overall applicability of this training format to those not comfortable or skilled with technology.

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