

Using Gamification in Outreach Camps: Experience from an IS Program

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Abstract—Reaching to young generation and attracting them to computing programs such as Information Systems (IS) and Computer Science (CS) is a key challenge faced by universities in Singapore. During their application process, many high quality students from junior colleges (JC) either don't choose IS program or choose IS program as the last option. School of Information Systems (SIS), Singapore Management University, decided to implement an innovative outreach program to reach and attract high quality JC students. A team of 30 faculty and staff worked on an outreach project to study and analyse the rationale behind the smaller numbers of applicants. We surveyed JC students and the results showed that only 5% of top JC students were aware of the term "Information Systems" and this seemed to be the root cause for low numbers and quality of applications to IS school. This shows that awareness is the first issue that should be tackled in our outreach. The outreach team unanimously agreed on executing an outreach camp which is designed to familiarize JC students on three main aspects; the value of IS in solving real world problems, common IS topics and IS related jobs. We have executed several outreach camps since our first run and have observed significant improvements in the number and quality of applications. In this paper, we share the gamified design of the outreach camp, results, challenges and lesson learnt in running an innovative IS outreach camp. We hope, our project will aid the university outreach teams in designing and organizing the outreach camps to the Gen-Z students.

Keywords— *Outreach, Junior College Students, Information Systems, Design Thinking Methodology*

I. INTRODUCTION

As Singapore turns into a Smart Nation, Infocom Technology plays a key role in enhancing Singapore's competitiveness through a highly skilled workforce. Reaching to young generation and attracting them to computing programs such as Information Systems (IS) and Computer Science (CS) is a key challenge faced by universities in Singapore. In, School of Information Systems, Singapore Management University, a team of thirty faculty and staff worked on an outreach project, to study the reasons behind the fewer and low quality applications to computer programs. Many high quality students from junior college (JC), during their application process, either don't choose IS program or make it as their last choice. We surveyed and analysed the reasons for this behaviour, and realized that overwhelmingly, 95% of JC students were not aware of what is "Information

Systems", and more specifically, the Information Systems program at our university. Thus attributing "lack of awareness" as a key factor that resulted in the low numbers and quality of applications. Hence, awareness is the first issue that should be tackled in our outreach efforts. Currently, the main sources for university information are websites, university talks and open houses. However, as observed from the student survey, camps, shadow student programs and interactive lectures were the most preferred means for gaining information regarding university experiences. Therefore, outreach activities play a crucial role in any University to reach to the right people with the right information.

Camps, talks, workshops, campus tours, early academic preparation programs, summer enrichment courses are some of the most popular outreach activities conducted by many universities to reach high school or junior college students [1, 2]. The design of the activities is aligned with the specific program offered by a department within a university. For example, computer science schools design the outreach activities around code, programming and computational thinking aspects whereas nursing schools design outreach activities around community, patient care, social worker and senior centres. Traditionally, outreach camps usually focus on faculty talks and networking. Though from our past experience, we have observed that these talks are not very effective.

The outreach team unanimously agreed on executing an innovative outreach camp which is designed to achieve three main objectives. The first objective is to familiarize the students with how IS innovates the way we live, play, work and study. The second objective is to aid students in understanding some of the IS topics such as security, analytics, mobility etc., and how these are important in real world applications. The final objective is to present the wide variety of job roles and opportunities for Information Systems professional and highlight some characteristics of the jobs such as flexibility, high salary, exciting nature of the work, career progression, etc. In our study, we also observed that the current JC students are from Generation Z (Gen-Z). Members of Gen-Z grew up with technology, and started using digital devices and internet from a very young age. Therefore, the traditional outreach camps, which mainly involved lectures are not effective in delivering the message, and achieving our

goals. We designed an innovative outreach camp that incorporates gamification to provide the platform for students to appreciate the role and value of Information Systems in the real world. The ultimate goal of the outreach camp is to attract high quality applications for the BSc Information Systems degree program.

Gamification is the concept of applying game-design thinking to non-game applications or projects to make them more fun and engaging, and simultaneously to achieve certain goals [4, 18]. In game-based learning, game is defined as “a system in which players engage in an artificial conflict, defined by rules, that results in a quantifiable outcome” [3]. Previous works of combining gamification and game-based learning have proven to enhance the learning process [14, 15]. The outreach camp is designed based on the gamification and game-based learning principles. In this paper, we describe our outreach camp framework that achieves our objectives through gamification. We elaborate the games, gaming mechanics and how they are integrated to bring in the awareness of IS to JC students. Subsequent to implementing the outreach camp, we observed a 38% increase in the number of applications from JC students. Furthermore, in this paper, we share the results, challenges and lesson learnt in running an innovative IS outreach camp. We hope, our project will aid the university outreach teams in designing and organizing outreach camps to Gen-Z students.

The rest of the paper is arranged as follows. Section II presents a literature review of related work. In Section III we introduce the design of our outreach camp. In Section IV, we present a detailed description of gamification components of the camp and how these components were implemented to achieve the three main objectives. In the final section we present the outcomes of the camp. We also present the results, lessons learnt, and conclusions that can be drawn from our work.

II. RELATED WORK

A. Outreach Programs

Outreach programs are the activities that provide information and services to any population who might not otherwise have access to those information and services. In the past six years, majority of outreach efforts focused on middle school and high school students, a majority of the reported events took place in the United States, and almost half had a goal of increasing gender diversity in computing [5]. In this paper, our focus is on outreach camp designed to attract high quality students to an information systems program by providing them with the awareness of IS in terms of its role in real world and career paths.

Individual Outreach Program (IOP) are directed at individuals. They can include student development programs, early academic preparation programs, awareness programs, and information outreach programs. Student development programs aim at providing work experience to individual students through university academic preparation and

internships for its undergraduate students. These programs provide opportunities for networking and future employment [6]. Academic preparations programs provide experiences of university life to the potential students through exposure to university courses [7, 8]. Awareness programs play an important role in bringing awareness of university programs to students and high school teachers [9, 10].

Information outreach programs provide primarily college information assistance and advising; these interventions are timed to address early awareness of college, college preparation, college entrance exams, test preparation, career prospects and financial aid. Some programs are run as day activities to bring awareness of curriculum and available opportunities [1]. In particular some programs aim to give students an understanding of what computer science is and what computer scientists do, and to get them to think about taking a CS1 course in their first year in college [11]. Technocamp is another outreach program that aims to make prospective students be more aware of CS through exposure to various technologies [2]. Some programs are also aimed at encouraging girls to take up a technology career [12]. Attracting good quality students is critical for computing programs [13] and this is the focus of our outreach project. Unlike traditional outreach programs, in designing our outreach program, we have taken into consideration some of the traits of Gen-Z students such as preference to consumer technology, low attention span, and passion for challenge and friendly competition. Therefore, we devise our outreach camp with gamification and game-based learning components.

B. Gamification and Game-Based Learning

Any learning approach based on games makes the attainment of educational objectives and the learning process easier, more student-centred, fun, interesting and more effective [16]. Papastergiour states that games are successful because players must use previously learned information to improve their score in the game [17]. Games also provide self-assessment tools such as the scoring mechanisms and the achievement of different levels, and use the social dimension to involve the community in the learning process.

Gamification refers to application of game-design thinking to non-game applications. Game-based learning (GBL) uses the characteristics of video and computer games to create engaging and immersive learning experiences for delivering specified learning goals, outcomes and experiences [23]. Gamification and game-based learning approaches provided promising solutions, and there is much experimental evidence that proves their positive effect on learning [3, 4]. The combination of their benefits successfully builds knowledge and skills that influence productivity. Both these approaches have become primary teaching tools in digital learning environments. Apart from education [19, 20], gamification has found its way into domains like marketing [21], and knowledge management [22]. Game-based learning has been applied in many science-related school subjects. Hung et al. [24] used game-based learning in a nutrition course,

discovering that this approach was more effective in enhancing the learning effectiveness and attitudes of students than traditional PPT teaching. Lin and Liu included game mechanisms in typing practice, inviting learners to beat their rivals [25].

Game mechanics for gamification are made up of a series of tools, that when used correctly, promise to yield a meaningful response from the players [4, 18]. Game mechanics for game-based learning describe the essential game play—the activity or sets of activities repeated by the learner throughout the game. These activities can primarily have a learning focus (learning mechanics) or an assessment focus (assessment mechanics); in many cases they address both [3, 14].

Using gamification does not involve adapting the content to fit the game story and rules, but the emphasis is to transform the learning experience into an educational game by using game elements to motivate and keep the students active (usually by a system of rewards or by indicating their level of performance). In game-based learning activities, games are used to achieve skills or knowledge. Pesare et al. devised two serious games using the gamification dimensions, aiming at sustaining engagement and motivation in learning processes in medical contexts [14]. Bartel combined mobile learning and game-based learning approaches with gamification for better learning in his project [15]. In our project, we took a similar approach. We combined game-based learning (GBL) with gamification to achieve the objectives of the outreach camp. Game-based learning for learning aspects and gamification for the driving competition and points system for enhancing the motivation among the participants.

III. DESIGN OVERVIEW OF EXPOSIS CAMP

In this section, we first present the overall design thinking process followed by the details of how each stage was implemented within the SIS outreach program. Figure 1 shows the overview of the outreach camp. The outreach camp has three major stages; invite, camp and conclusion.

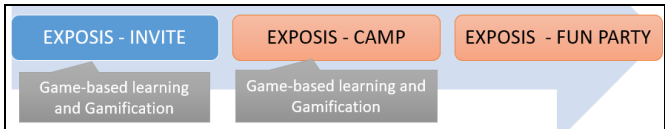


Figure 1: Design overview of outreach camp, ExpoSIS

The first stage is aimed at inviting the JC students to the camp by motivating them to experience the fun. Therefore, the registration to camp is designed with gamification aspects (achievement levels) and GBL (content videos) where the participants learn, completes an activity, and earn points that lead to gold, silver and bronze tickets. In the second stage, the participants who joined the camp will be grouped to play in teams. In this stage, we combined both game-based learning and gamification components to achieve our three main objectives described in Section I. In the last stage, we designed a fun party that enables the participants to mingle

with faculty and students for more exposure, and to experience the SIS culture.

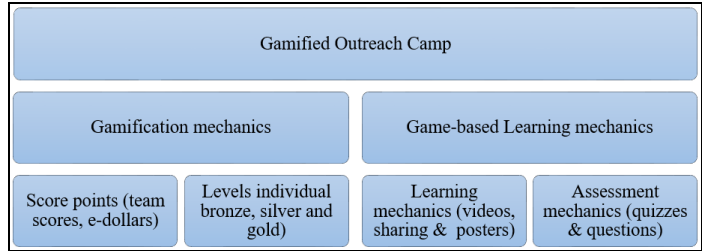


Figure 2: Game mechanics for ExpoSIS Camp

Figure 2 shows the game mechanics that is adopted from previous works [3, 4] and incorporated into the camp activities. The details of the first two stages are described in the following sections along with the game mechanics.

IV. EXPOSIS INVITE - GAMING FOR INVITATION

In this section, we describe the design and implementation details of each stage of the ExpoSIS outreach camp.

A. Gamified Registration to Camp

ExpoSIS-invite is gamified with two main objectives: to motivate participants (Junior College - JC 1/2, International Baccalaureate - IB 5/6 students) to register for the camp and increase awareness of IS and IS-related topics. The goal is to have as many motivated participants as possible to register for the camp. Figure 2 shows the flow of the registration process and each stage of registration has gamification and/or game-based learning aspects. The registration site is developed as a web application and the registrants will complete the entire registration process online.

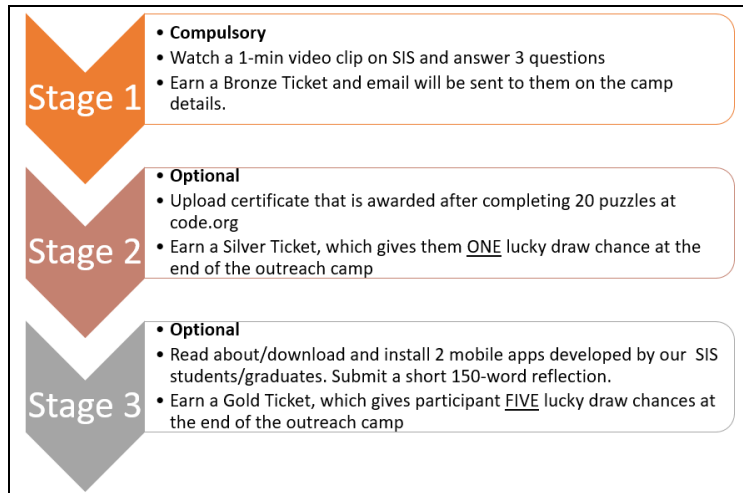


Figure 3: Gamified registration process overview

Stage 1 is compulsory for the participants to gain a ticket for the camp. The students watch video clips and answer questions correctly to gain the “bronze ticket”. In Stage 2, we ask the registrants to perform some basic code related

<p>Clue Cracker (Game 1)</p> <p>Game Goals</p> <ol style="list-style-type: none"> 1. How IS play role in the way we live, play, work, learn? 2. How is IS useful in real world? <p>Game Settings</p> <p>As trainee cyber agents, each team is expected to decipher a series of 4 clues. The teams' mission is to find the problem solved in the project and for which users.</p>	<p>Decipher (Game 2)</p> <p>Game Goals</p> <ol style="list-style-type: none"> 1. What students learn in SIS? 2. What is information systems, some topics? <p>Game Settings</p> <p>The evil hacker cell leader coordinates attacks via an encoded message. The teams' mission is to find out the most probable location (postal code) for the hackers' meetings.</p>	<p>Jackpot Rush (Game 3)</p> <p>Game Goals</p> <ol style="list-style-type: none"> 1. What is life or culture in SIS? 2. What are career paths for IS graduates? <p>Game Settings</p> <p>Alumnus and teams interactively participate in sharing sessions and answering the quiz. The teams' mission is to answer the quiz related to SIS and IS jobs</p>
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Figure 5: Gamified camp; three major games to achieve our goals of outreach camp.

activities. This activity enables the participants to understand from a technology perspective, what Information Systems (IS) is about, by writing simple code to complete certain tasks. On completion of 20 code puzzles, the participants are entitled to silver ticket. This ticket earns “silver” points which gives them one additional chance in the lucky draw during the camp. The final stage is to expose the participants on how IS applications can help solve problems in business and society. The participants will have to download two mobile applications developed by SIS students, use them, and submit a 150-word reflection. The submission entitles them to a “gold ticket. This ticket earns “gold” points which gives them five additional chances in the lucky draw during the camp.

B. Website for Registration

ExpoSIS invite is a web-based application and participants can complete the registration from any location. Figure 4 shows the main page of the application. The registration site is developed in-house by the SIS team. The link is shared with Junior Colleges in Singapore to help disseminate the camp details to the JC students. In order to encourage more participation, we advertised the prizes and activities that will be held during the camp.



Figure 4: ExpoSIS-Invite; Camp registration website

V. EXPOSIS CAMP- GAMING FOR CAMP ACTIVITIES

The camp activities are help within the school campus and involve a combination of game-based learning and gamification. The participants are grouped into teams of five and play three different games. Recall that the aim of the camp is to familiarize participants with:

1. How Information Systems innovates the “way we live, play, work and study”?
2. What one learns in Information Systems curriculum?
3. What are the job prospects for IS graduates?

We designed three games to achieve the above goals which form the crucial components of the camp. Figure 5 shows the overview of the games in the camp. We also performed a pilot test with our own SIS faculty and students before the actual camp day. We first present the camp planning and then describe the details of each game.

A. Camp Activities Agenda

The camp is designed for half day and hence there is need for proper planning to ensure smooth execution of the camp activities. Multiple teams were created and each team was responsible for one activity in the camp. The camp aimed to accommodate a maximum of 100 students. Table I shows the planning of the camp together with the purpose and people involved in each section of the camp.

Table I: Camp Planning and Schedule

Time	Task and Purpose	People
9.00am	Registration & gaming setup (Preparations)	Faculty, admin staff, student helpers
9.30am	Registration, breakfast (Forming the teams)	Registration team that included admin staff and student helpers
10.00am	Ice-Breaking game (Participants familiarize)	Registration Team
10.30am	Games Game 1 – Room 1, Game 2 – Room 2, Game 3 – Room 3	Respective game coordinators and student helpers
1.30pm	Fun party, lunch prize giving, lucky draw	Faculty, admin staff, student helpers

2.30pm	Dean's closing speech	Dean, faculty, admin staff, student helpers
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The major component of the camp are the games session and hence major coordination efforts are dedicated to this session. Since the goals can be achieved in a random order, the three games can be played in any order. Hence, we fixed the location of the games and moved the participants in and out of the game rooms.

B. Game-Based Learning – 3 Games

The three crucial games of the camp are designed with game-based learning and gamification concepts. Usually, camps may or may not have games and the actual knowledge transfer is done via talks. However, in our camp design, the objective of knowledge transfer about IS, IS topics and job career is achieved through games to motivate the participants and aid in better learning. Figure 4 shows the high level design of the games. We explain the details of each game in the following sections. Since the games are independent of each other and can be played in any order, this arrangement enables to efficiently execute the camp by grouping the teams and playing the games simultaneously, thus saving time.

To further motivate the participants, we introduced the gamification components that helps them to score points and e-dollars. Figure 6 shows the score card for the participants. Each team is given a score card and they are awarded points at the end of each game by the specific game headquarters managed by faculty.

Team Score Card	Team Name		Members	
	Total Points:			
	Game Station	Start Points	Game Points	
	Clue Cracker SIS SR 3.1	100		Time Taken (mins)
The Decipher SIS SR 3.2	100			
JackPot Rush SIS SR 3.3	\$2000			

Figure 6: Scorecard for the teams

1) Game 1 – Clue Cracker

The objective of this game is to help participants understand how IS innovates the way we live, play, work and study. To achieve this, we used the SIS students' capstone projects in the game design. These projects are examples of innovative IS application in real world and therefore are relevant to this objective.

Game Background

Game Setting: As trainee cyber agents, each team is expected to decipher a series of four clues to establish the problem that is being addressed in the project and the proposed end users of the application that is developed. To

achieve this, clues are presented as QR codes to the participants and they have to analyse the clues to find the solution. Once the solution is identified, the teams will fill up the solution card and submit it to the headquarters to update scores on score card. Figure 7 shows the overview of game 1.

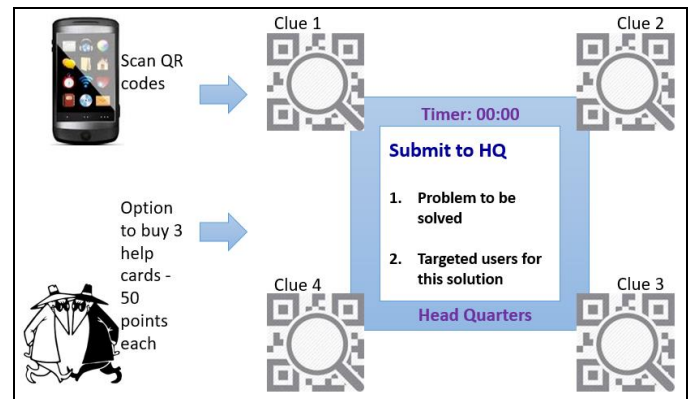


Figure 7: Overview of game 1, Clue Cracker.

Game Implementation Details

SIS in-house team developed a mobile application, FindIt, for the participants to play Game 1. The clues are provided as QR codes on posters displayed in SIS campus. FindIt enables the students to unfold the clues of each project where each project has eight QR codes in the form of clues. Using the decrypted clues, the teams analyse the contents of the projects. Table II shows sample projects that have been used in the game. The teams scan the QR codes and then piece them together to discover; the problem that the application is trying to solve and targets or likely users of the application.

Table II: Sample projects for game 1, Clue Cracker

Problem Description	Targeted Users
An interactive field guide and birding diary for bird watchers on their bird watching trips	Public – bird watchers
A web application where users can build an infographic resume, manage and track their resumes, create their cover page and share it on Facebook and LinkedIn.	public
A mobile application which allows residents of Singapore to report issues and give feedback to various government agencies, as well as to crowdsource urgency of the common issues raised to help prioritize action.	Singapore residents, government agencies
A web application for F&B merchants to upload and manage their advertisements, while customers can like and share these ads on Facebook to gain points to redeem cash.	F&B merchants, public, customers
An application for students to make and update locker reservations as well as request for locker maintenance, and for locker administrators to view locker utilization and maintenance performance.	Students locker administrators

When the game ends, the teams will move to the next game room if this is the first or the second game, else to the fun party location.

2) Game 2 – The Decipher

The objective of this game is to aid participants understand two chosen IS topics, security and analytics, and how these concepts are important in real world applications.

Game background

Game Setting: “The evil hacker cell leader coordinates attacks via an encoded message. The mission is to find out the most probable location (postal code) for the hackers’ meetings”. To achieve this, the teams have to complete two tasks to solve this problem; cryptogram to crack the message and analytics to find the postal code of the meet. Figure 8 shows the overview of Game 2. The first part of the game is the cryptogram task and the second is the analytics task. At the end of the game, the teams claim the scores from the headquarters.

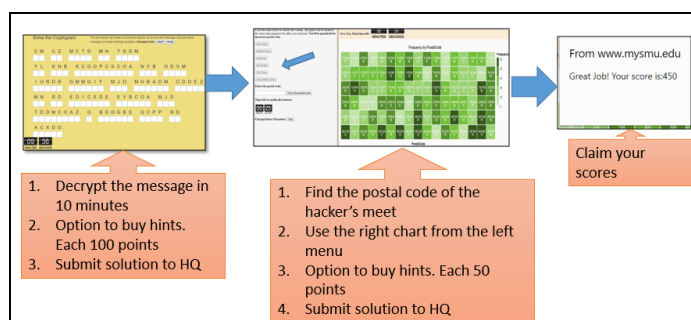


Figure 8: Overview of game 2, The Decipher

Game Details

We developed the cryptogram and analytics web application that consists of timer and points system.

1. Cryptogram: The team will have to decode a message which will reveal meeting time and other important information relevant to the postal code. Figure 9 shows the interface of the cryptogram web app.



Figure 9: Cryptogram game to decrypt the message

The cryptogram web app is embedded with a timer and participants are also provided with the poster on how to decrypt the cryptogram. The students can buy hints to solve it and once the solution is discovered, they claim scores from the headquarters.

Once the team manages to solve the message, they move to the next level, where there are hundreds of postal codes that are discovered from several messages decrypted by the other cyber teams.

2. Analytics Game: The team will have to apply analytics to discover the most possible location of the hackers meeting from hundreds of postal codes. The highest occurring postal code in the messages is the possible location for the meeting. Several charts are created based on the postal codes and their frequency, the teams have to choose the right chart to discover the correct postal code. Figure 10 shows the analytics game with the timer and the teams choose the correct chart to know the postal code. They can refer to the analytics poster for help.

Once, the team manages to find the correct postal code, they can claim the scores from the headquarters. The timers control the scores of the team. The quicker they solve, the higher the score. The teams will move to the next game room if this is the first or the second game, else to the fun party location.

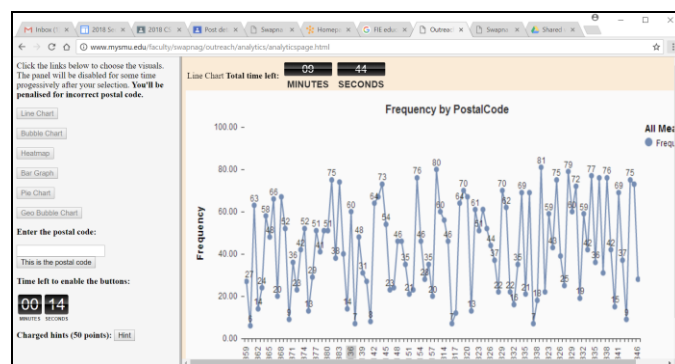


Figure 10: Analytics game to find the postal code for meet.

3) Game 3 – JackPot Rush

The objective of this game is that the participants gain a clear understanding of job opportunities for SIS graduates; flexibility, good salary, exciting work, career progression, etc. In particular our focus is on life in SIS and career as an SIS graduate. Figure 11 shows the overview of game 3. We have the alumni to share their experience at the school and the job world. This will be followed by quiz related to the content covered in the talk.

Game background

Game Setting: In this game, alumnus and students participate interactively to achieve the objectives of the game. The alumnus sharing about life in SIS and career paths with IS will be quizzed on a big screen for the participants to answer

and score points for their teams. This enables the participants to learn about our school and other job related attributes. The scoring system is extended to include additional points for asking interesting questions to alumnus that enables the team to answer the quiz. Figure 11 show the overview of Game 3, jackpot Rush.

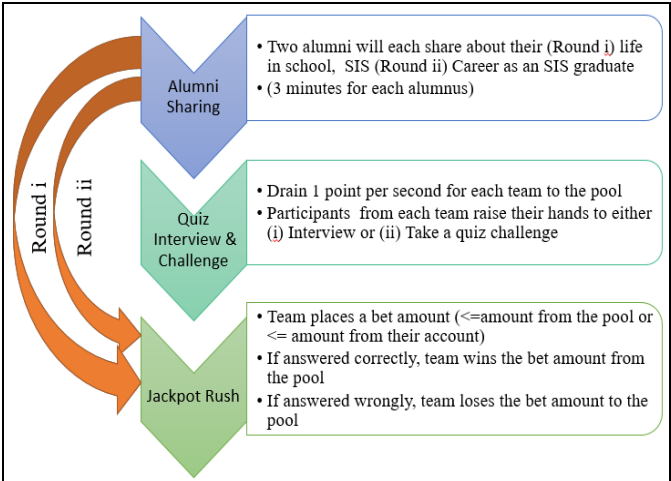


Figure 11: Overview of game 3, Jackpot Rush.

Each team will start with 2000 default e-dollars. The alumni sharing is timed and the teams will plan their strategy to either interview or take the quiz. As soon as one team choses the quiz, they place the bet and trigger the jackpot rush. The teams can view the live accounts with amount of e-dollars. The e-dollars will continue to drain until one of the teams takes the quiz challenge. According to the answers, the pooled e-dollars will be awarded to the teams. The game has two rounds; life in SIS school and career as an IS graduate.

Game Details

We developed an in-house Jackpot Rush application. To prepare the quiz questions, we approached our alumnus to answer the pre-set questions related to SIS and their job. Table III shows the quiz questions that the teams will be asked after the alumni sharing. The questions are categorized into two dimensions; alumnus job details and his/her SIS experiences.

Table III: Quiz questions for game 3, Jackpot Rush

Alumni Current Company Information
What is the current company that the alumnus is working at?
How many years has the alumnus worked in his/her current company?
What is the business domain of the Alumnus' company?
What is the job title of the Alumnus?
What is the job scope of the Alumnus?
Workings hours in the company for the Alumnus
How long did it take to reach your current position?
Alumni Working Experience

Total number of working experience since graduation
Starting Salary of Alumnus
How did the Alumni found his/her first job?
How many months before/after graduation did the Alumnus took to get his/her first job?
Do you work with IT or Business users more?
Career plan for the future (what alumni plans to do; may or may not be with his current company)
Does the Alumnus take any Post-grad studies or Professional Certification?
Alumni SIS Information
Which company did the alumnus go for Internships?
What modules taken as an undergrad was helpful for your career?
How does an SIS degree help in the Alumnus' career?
What is one thing that university taught you to help in your career?
What is one thing that university did not teach that would have been helpful in your career.

Each round will be played for 15 minutes and the final scores will be awarded to all the teams by the headquarters. The teams will move to the next game room if this is the first or the second game, else to the fun party location.

C. ExpoSIS-Fun Party

The aim of the fun party is two folded. Firstly, it allows the participants to experience the friendly culture of SIS and secondly, it enables the game organizers to wrap up the scores and announce the winners. Subsequently, the faculty, instructors, staff, students and participants are gathered to listen to SIS dean’s concluding remarks followed by prize distribution.

VI. RESULTS, LESSONS LEARNT, AND CONCLUSIONS

The first run of the camp, ExpoSIS day, was well received, we had 75 JC students for outreach camp day. At the end of the camp, we conducted a survey on the participants to collect the feedback on the camp. Based on the feedback from the participants, the sentiments for each component of the camp is as shown in Figure 12.

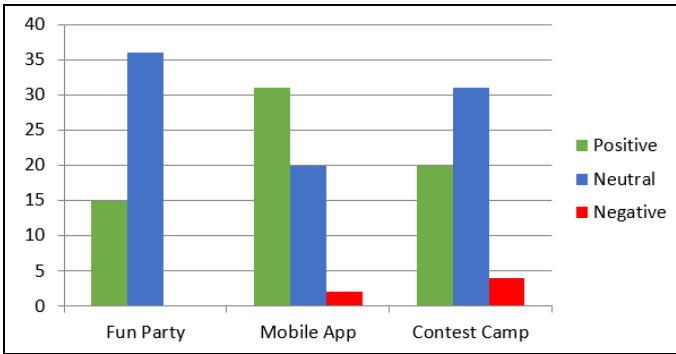


Figure 12: Sentiments on the camp components.

Some negative feedback for Mobile app was about the usability and time constraints. This is a pilot run where we discovered few errors in the tool, and we improved the mobile app for the subsequent runs. The negative feedback on fun party is the timing, they found that the timing was too short and needed more time to network. On the Overall camp, the negative feedback was about the timing of the camp. To ensure to reach more students, we planned multiple outreach camps run throughout the year. This enabled the JC students to select a camp based on their availability.

Figure 13 shows some sample feedback from students who participated in the camp. The feedback shows that the camp design enabled us to give the right information to the participants by leveraging game-based learning and gamification.

"I enjoyed the camp as I really got to know more about Information Systems. The culture and environment at SIS is wonderful, fun and welcoming."

"The pace is comfortable; the games are interesting and well-planned, and they give insights into IS. I like most about the sharing by profs and senior students about the course, the school, and the industry."

"I learnt more about SIS and how university SIS is like through the camp. What I like the most is the interaction with the SIS students."

"The camp was very engaging and informative. I got to learn a lot about what university (SIS) offers."

Figure 13: Student feedback on ExpoSIS Day (Camp)

Subsequent to implementing the outreach program, we observed a 38% increase in the number of applications from JC students compared to the previous year. We also observed an improvement in the quality of the applications. University Admission Score cut-off is applied for all JC students applying to our university. For 85-90 points and above, the number of applications increased by 35%, for 82.5-83.25 points, the number of applications increased by 36.4%, and for 80 – 81.25 points, the number of applications increased by 46.2%.

Following are some lessons learnt from our experience in implementing game-based learning and gamification in the outreach camp.

The first challenge related to the design and development of games that accomplished our goals. At the start, having a large group did not help, as there were many discussions and no clear outcomes. In order to overcome this challenge, we formed sub groups to work on the details of the game for each section of the outreach camp. The sub groups developed the games and members from other sub-groups pretended to be the participants and tested the games. This process helped to remove some of the glitches within the games and further refine them. Thus ensuring a smooth execution of the games on the ExpoSIS day.

The second challenge we faced is the smaller group of participants signing up for the first camp. Our goal of ExpoSIS invite is to reach to as many JC students. Hence, we reached to

some school student counsellors, ran a workshop for them in our school to give awareness about IS and SIS. This helped to increase the registration numbers as these counsellors marketed our camp within their JCs.

The third challenge relates to the quality of the students registering for the camp. Our goal is to attract high quality and highly motivated JC students. To achieve this, the registration games helped in filtering the less motivated students to deter from signing up. This resulted in a very energetic group of participants on the camp day. In fact, for the subsequent runs, we were forced to close the registration due to high demand from good quality applicants.

In the past, only a handful of people were actively involved in the outreach efforts. However, after this project, there was more enthusiasm and interest from a lot of faculty and staff in school. After our first run, we managed to execute several runs of outreach camp till date. We continue to see the impact on our application process and the quality of students applying to SIS. Most importantly, our goal of IS and SIS awareness is an on-going effort and we have been implementing other strategies as well; talks in JCs, Facebook page, CodeIt events etc. We hope that our outreach camp design and experiences will be useful to the other IS schools in their outreach efforts.

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