

INTERACTIVE ASSESSMENTS USING GAMIFICATION TOOLS: KAHOOT! & SOCRATIVE

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Abstract:

The Ph.D. research project "Gamification in Middle, Secondary and Higher Education to motivate learners and develop creative thinking" enabled me to introduce Gamification tools in GSS Jain Gurukul Cambridge International residential school, Chennai, India, to conduct Interactive Assessments in teaching. The feasibility study was carried out on the curriculum of Middle and Secondary education with the available technology of the institution, and Gamification tools. A questionnaire one was conducted to identify students' participation, engagement, and self-initiative in learning the module, and the usage of multimedia tools in classroom activities. Questionnaire one and the research study ensured to decide and introduce Gamification tools Kahoot! and Socrative for various classroom activities of GSS Jain Gurukul students. A case study was used as a method in this research. At the end of the academic year questionnaire two was applied to identify students' participation, engagement, motivation, creative thinking, and self-confidence in learning. The results show that almost all students strongly agreed on the above factors and that gamification strongly stimulated their enthusiasm and willingness to use such tools in their learning.

Keywords: Gamification tools, Kahoot, Socrative, Interactive Assessments.

Resumo:

O projeto de investigação de doutoramento "Gamification in Middle, Secondary and Higher Education to motivate learners and develop creative thinking" (Gamificação no Ensino Médio, Secundário e Superior para motivar os alunos e desenvolver o pensamento criativo) permitiu-nos introduzir ferramentas de Gamificação na escola residencial GSS Jain Gurukul Cambridge International, Chennai, Índia, para conduzir Avaliações Interativas no ensino. O estudo de viabilidade foi realizado sobre o currículo do Ensino Médio e Secundário com a tecnologia disponível da instituição, e as ferramentas de Gamificação. Foi realizado um questionário para identificar a participação, envolvimento e autoiniciativa dos estudantes na aprendizagem do módulo, e a utilização de ferramentas multimédia em atividades de sala de aula. O questionário um e o estudo de investigação asseguraram a decisão e introdução das ferramentas de Gamificação Kahoot! e Socrative para várias atividades de sala de aula dos alunos da GSS Jain Gurukul. Um estudo de caso foi adotado como método nesta investigação. No final do ano académico foi aplicado o questionário dois para identificar a participação, envolvimento, motivação, pensamento criativo, e autoconfiança dos estudantes na aprendizagem. Os resultados mostram que quase todos os estudantes concordaram fortemente com os fatores acima mencionados e que a gamificação estimulou fortemente o seu entusiasmo e vontade de utilizar tais ferramentas na sua aprendizagem.

Palavras-chave: Ferramentas de gamificação, Kahoot, Socrative, Avaliações interativas



Technologies are rapidly thriving day by day and have brought a remarkable proficiency in the field of education. According to Beverley Allan (2017), most of the learners now have access to a Smartphone and there is a drive to make use of this technology to improve learners' engagement, participation, performance, understanding, and

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emotional experiences. Effective interactions in the classrooms develop students to build their abilities, interests and gain experience in their learning. They provide for their needs and facilitates them to take initiative in activities and to make their own choices. They develop independent and responsible attitudes in their behavior.

This research was conducted to focus on Interactive assessments using Gamification tools for middle and secondary students of GSS Jain Gurukul Cambridge International Residential School, Chennai, India. This idea was mooted from the research study of the Ph.D. program (Multimedia in Education) to implement Gamification tools in Education.

A Case Study was used as a method in this research. Questionnaire one, interviews, and classroom observations were used to collect data, and a feasibility study was carried out on the curriculum of Middle and Secondary education with the available technology of the institution, along with Gamification tools. Questionnaire one and the research study ensured to decide and introduce Gamification tools Kahoot! and Socrative for various classroom activities of GSS Jain Gurukul students. According to the study by Festus Olatoye (2015) the impact of Kahoot! on students has been tremendous, it increased students' engagement and motivation to learn and challenge themselves. Dave (2012) states Socrative is a really efficient tool with a lot of potentials for faculties to gain experience in using it.

Kahoot! and Socrative have concepts of game mechanics and game dynamics to engage students in activities. It supports creating of Interactive assessments using objective-type questions and short answers. This article explains how to perform various interactive assessments in Kahoot and Socrative, creating awareness for teachers to relate their subjects to conduct an interactive assessment in classrooms to enhance students' participation effectively and promote their ideas and creativity. At the end of the academic year questionnaire two was applied to find students' participation, engagement, motivation, creative thinking, and self-confidence in learning. The results show that almost all students strongly agreed on the above factors and that Gamification strongly stimulated their enthusiasm and willingness to use such tools in their learning.

GAMIFICATION IN MIDDLE AND SECONDARY EDUCATION

Questionnaire one was designed and conducted on 19th October 2018 to evaluate the intrinsic motivation of students, participation and engagement in classroom activities, skills development, innovative ideas, and their creativity in learning, and to check whether multimedia tools are used in learning the subject Computer Science for grade 9 and Mathematics for grade 7.

RESEARCH QUESTIONS(QUESTIONNAIRE 1)

- 1) The module content is designed so as to be interesting.
- 2) The module supports the specific interest of my life.
- 3) The module is intellectually challenging
- 4) The lecturer encourages participation in class.
- 5) I consider I have initiative and am creative to learn.
- 6) The module allows me to develop innovative ideas.
- 7) I am fully engaged in my regular class activities.
- 8) Lectures provide me the means to perform the task adequately.
- 9) I receive helpful feedback about my work.
- 10) Multimedia tools are used in my studies.

RESEARCH OBJECTIVES (QUESTIONNAIRE 1)

- 1) To confirm the module is designed interestingly to learn.
- 2) To assess skill development by learning the module.
- 3) To test if the module is intellectually challenging.
- 4) To collect evidence of class participation.
- 5) To identify initiative and creativity in learning.
- 6) To identify the features of the module that support innovative ideas.
- 7) To assess students' engagement in the class.
- 8) To assess if active participation in learning is present and to what extent.
- 9) To identify and describe guidance from the lecturer.
- 10) To verify if the usage of multimedia tools in learning takes place.

An ordinal scale was used in the questionnaire for the ratings of quality. The Likert scale measures were assigned with values Strongly Disagree (SD) -1, Disagree (D) -2, Neither Agree Nor Disagree (NAND) -3, Agree (A) - 4, and Strongly Agree (SA) -5 as shown in table 2 below and the questionnaire data of Table 1 were also counted and represented in the table 2.

TABLE 1: QUESTIONNAIRE 1 DATA FOR GRADE 9 STUDENTS

Questionnaire Data for Grade 9 Computer Science Students										
Students	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Student 1	A	SA	SA	A	A	A	A	NANDA	NANDA	A
Student 2	A	SA	NANDA	NANDA	DA	SA	NANDA	A	SA	NANDA
Student 3	NANDA	SA	SA	SA	NANDA	DA	SA	SA	DA	NANDA
Student 4	A	SA	DA	A	NANDA	A	NANDA	SA	A	DA
Student 5	SA	SA	A	A	A	A	SA	SA	A	SA
Student 6	DA	NANDA	SA	A	A	SA	A	SA	A	DA
Student 7	A	SA	SA	SDA	SA	A	NANDA	NANDA	A	SA

The above table data was counted and displayed below with Likert scale measures.

TABLE 2: LIKERT SCALE VALUES AND QUESTIONNAIRE 1 DATA FOR GRADE NINE

LikertScale	Q1	Q 2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
SDA ->1	0	0	0	1	0	0	0	0	0	0
DA-> 2	1	0	1	0	1	1	0	0	1	2
NANDA->3	1	1	1	1	2	0	3	2	1	2
A->4	4	0	1	4	3	4	2	1	4	1
SA->5	1	6	4	1	1	2	2	4	1	2

To identify the category for each question in the Likert scale, data of each question was added to find cumulative responses, using cumulating responses data, the median was calculated using the formula $(n+1)/2$ that is $(7+1)/2 = 4$. This was used to find the category, which falls in cumulative responses and this was considered as the median.

Below shows the summary report of objectives and category after finding the median for grade nine students (Secondary Education).

- | | |
|--|------------------------------|
| 1) To confirm the module is designed interestingly to learn. | - Agree |
| 2) To check skill development by learning the module. | - Strongly Agree |
| 3) To test the module is intellectually challenging. | - Strongly Agree |
| 4) To examine the class participation. | - Agree |
| 5) To analyze self-initiative and self-creative in learning. | - Agree |
| 6) To investigate the module that supports innovative ideas. | - Agree |
| 7) To assess the students' engagement in the class. | - Agree |
| 8) To test active participation in learning. | - Strongly Agree |
| 9) To check guidance from the lecturer. | - Agree |
| 10) To ensure the usage of multimedia tools in learning. | - Neither Agree Nor Disagree |

The same questionnaire was conducted for **grade seven students** (middle level) of GSS Jain Gurukul on 23rd October 2018 for the subject mathematics. Table 3 shows the results of questionnaire 1.

TABLE 3: QUESTIONNAIRE 1 DATA FOR GRADE SEVEN STUDENTS

Questionnaire data results for Grade 7 for Subject Mathematics										
Students	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Student 1	SA	SA	A	SA	SA	A	A	SA	SA	NANDA
Student 2	SA	SA	A	SA	A	SA	SA	NANDA	SA	NANDA
Student 3	A	SA	A	SA	NANDA	A	SA	A	SA	NANDA
Student 4	SA	SA	NANDA	A	A	A	NANDA	SA	A	DA
Student 5	SA	SA	NANDA	A	A	SA	A	SA	NANDA	A

Below we show the consolidated summary report of questionnaire 1 after finding the median for every objective.

- | | |
|--|------------------------------|
| 1) To confirm the module is designed interestingly to learn. | - Strongly Agree |
| 2) To check skill development by learning the module. | - Strongly Agree |
| 3) To test the module is intellectually challenging. | - Agree |
| 4) To examine the class participation. | - Strongly Agree |
| 5) To analyze self-initiative and self-creative in learning. | - Agree |
| 6) To investigate the module that supports innovative ideas. | - Strongly Agree |
| 7) To assess the students' engagement in the class. | - Strongly Agree |
| 8) To test active participation in learning. | - Strongly Agree |
| 9) To check guidance from the lecturer. | - Strongly Agree |
| 10) To ensure the usage of multimedia tools in learning. | - Neither Agree nor Disagree |

The above report enabled to plan further to include **multimedia tools in teaching** and to enhance students' participation and engage students actively in classroom activities. To do this, the second-year seminar module of the Ph.D. program guided to plan with two phases, **Phase1) Data Collection** and **Phase 2) Design for Gamification**, as included in the case study.

METHODOLOGY

Case Study was used as the method, based on the research questions and objectives. Data collection was designed in phase one as shown below with concepts, dimensions, indicators, research phase, and time interval for the phase, techniques, and instruments for data collection. This plan of phases one and two were designed in the Seminar 1 module of the Ph.D. program, under the guidance of Professor Margarida Almedia of the University of Aveiro, Portugal.

PHASE 1: DATA COLLECTION

Concepts	Dimensions	Indicators	Research Phase 1- Time interval	Techniques	Data Source/ Instruments for Data Collection
<p>(Case Study on a Specific Module)</p> <p>Motivation in Learning</p>	<p>Student Participation and Engagement in activities</p> <p>Students Interaction with lecturer</p>	<p>Participation</p> <p>Number of Students attends and actively involved in the activity</p> <p>Emotional Engagement</p> <p>Students' feeling with the teacher and the classroom</p> <p>Behavioral Engagement</p> <p>How students are attentive and active in classroom</p> <p>Cognitive Engagement</p> <p>How students are intrinsically motivated in learning process.</p> <p>Interaction</p> <p>Establish and maintain eye contact with students in classroom.</p> <p>Ensure students interact with each other to accomplish the task.</p>	<p>(Data Collection)</p> <p>First semester</p> <p>(Six months)</p> <p>June</p> <p>to</p> <p>November</p> <p>(2018)</p>	<p>Class Observation</p> <p>Interviews</p>	<p><u>Data Source</u></p> <p>Attendance Register</p> <p>Course materials, Module descriptors</p> <p>Module Milestone, Presentation materials, Text books related to the module for reference.</p> <p><u>Instruments for Data Collection</u></p> <p>Check list and Data compilation forms, lesson plan</p> <p>During the lesson how students listen and respond.</p> <p>Are the students listening attentively?</p> <p>Test the subject knowledge of students by asking questions.</p>

	Students Performance Assessment in	<p>Are the students able to remember the concepts, what they have learnt in classroom</p> <p>Are the students able to understand the concepts</p> <p>Are the students able to apply the concepts?</p>			<p><u>Instruments for Data Collection</u></p> <p>Interaction with students</p> <p>Questionnaire</p> <p>Class Test & Assessments</p>
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CASE STUDY

This study was focused on middle and secondary students of GSS Jain Gurukul Cambridge International Residential School from **22nd September 2018 to 27th July 2019**. In GSS, initial research was carried on the IGCSE (International General Certificate of Secondary Education) curriculum, teaching methodology of IGCSE, Existing Technology in GSS, and their usage in classrooms.

To ensure quality in teaching IGCSE curriculum on a specific module, enrolled and completed online training on the Introductory Cambridge IGCSE Computer Science (0478) course conducted by “Cambridge Assessment International Education” from 13th February to 24th March 2019. This enabled me to understand teaching and assessing students in Cambridge Assessment International Education.

To assess students’ learning in middle and secondary education, **phase one table** was used (displayed above) as a guideline to collect data. To analyze motivation in learning, dimensions were used like **student participation**, **students’ engagement** in activities, and **student interaction** with a teacher in line with research questions and objectives and prepared a questionnaire 1 as a part of data collection.

Questionnaire 1 was designed to evaluate the intrinsic motivation of students in learning the subject Computer Science for grade 9 and Mathematics for grade 7, participation and engagement in classroom activities, motivation in learning, skills development, innovative ideas, and their creativity in learning, and to check whether multimedia tools are used in their learning.

The report of questionnaire 1 enabled to plan and design **Phase 2 “Design for Gamification”**, with concepts **game mechanics** and **game dynamics** with the following dimensions - graphics, goal setting, calls to action, and learning and engaging with indicators as mentioned in the table below.

PHASE 2: DESIGN FOR GAMIFICATION

Concepts	Dimensions	Indicators	Research phase	Time interval for the phase	Data source/ Instruments for designing
A Gamification Tool Game Mechanics & Game Dynamics	Graphics	Interface Attractiveness Text & Actions Legibility	Phase 2 (Design Phase)	Second Semester (Six months) December (2018) to May (2019)	<p>Data Source Collected data from Phase 1 Instruments for Designing</p> <p>Gamification Tools Kahoot! Socrative</p> <p>Activities and Assessments will be designed based on the availability of options in gamification tools.</p> <p>Appropriate the font size for questions will be used.</p>
	GoalSetting	<p>Gamification Duration (Difficult/ Easy) Scale & Boundaries (Inside the chapter)</p>			<p>Particular chapter in the module.</p> <p>Number of questions for the activity, based on the duration of the session.</p> <p>Allocating suitable time for every question for students to answer.</p> <p>Difficult or Easy mode of questions will be considered based on the chapter/activity and availability of session.</p>
	<p>Calls to Action (Learning & Engaging)</p>	<p>Positive/ Negative Response (Freedom to Fail) Quick Feedback Reflects Points/Marks in the form of Badges/ Trophies/ Leader board</p>			<p>Quick Feedback –from class activities based on the gamification tools.</p> <p>Testing and Validation based on Dimensions and Indicators</p>

RESEARCH STUDY ON GAMIFICATION TOOLS FOR EDUCATION

KAHOOT!

It is a game-based platform for teachers to create quizzes to play and share. It unleashes fun in classrooms, it allows teachers to create multiple-choice questions, true or false or the new option “Jumble” to place the answer in correct order rather than selecting the correct answer. Teachers can set the option single-player mode (classic) or challenge mode (team mode) to compete with their friends. Students can join the live game using a unique pin shared on the big screen or they can perform Kahoot! challenge that complete at their own pace as homework. The live game creates awareness for teachers to know the participation of students based on their names. Teachers can reject students if they are connected through nicknames.

According to Jamie Madigan (2016), there are eight potential reasons why badges, achievements, and trophies might work: 1) They anchor our performance expectations higher, 2) Having goals increases our self-efficacy, 3) Completing goals leads to satisfaction, 4) They create goal commitment, 5) They act as guidance mechanics and provide feedback, 6) They facilitate psychological flow through feedback, 7) They trigger social proof, 8) They trigger motivating social comparisons. In this research study, the gamification tools above support badges, achievements, and trophies, which in turn support gamification development in this project.

SOCRATIVE

It is a classroom application for fun, effective engagement, and on-the-fly assessments. It allows students to connect instantly for learning, it assesses students with prepared activities using a quiz, the space race, exit ticket or ask a quick question for instant feedback. This allows teachers to adjust their teaching based on their feedback. Socrative can be used on smartphones, tablets, laptops, and computers, and it is 100% free for students to use on any device.

MINECRAFTEDU (EDUCATION EDITION)

It is an open-world game that is designed for classrooms and educators. It promotes creativity, collaboration, project-based learning, and problem-solving in an immersive environment for various subjects like computer science, visual arts, game design, code programming, etc. Minecraft hosts a library of lessons and activities that are available for free, and there is a vibrant, active teacher community exploring uses of Minecraft in the classroom. Over 5,500 teachers in 40+ countries have used MinecraftEdu to teach various subjects. They provide basic training videos, sample lessons, and connections to other Minecraft educators to make smooth learning.

CLASS CRAFT

This enables to gamify the classroom with real game elements that provide rich and interesting play experiences for students by applying them in the classroom setting. It offers various features designed to drive students in the classroom and engage with various tasks to play in teams. Teachers can overlay their course content and learning activities onto an interactive map, making their lessons an adventure experience. Each point on the map consists of a learning activity created by the teacher, which could be a worksheet, video, quiz, or other material, alongside an optional narrative element. As students complete activities, the adventure unfolds, getting them excited to progress and find out what happens next. It supports thousands of customization options for their avatars. This creates a collective experience for students to build positive classroom culture. It supports analytics to keep track of a student's behavior in the classroom.

Based on the consolidated data of questionnaire 1 which was conducted in GSS Jain Gurukul and the initial study of the curriculum (IGCSE) and the research study of gamification tools for education enabled to plan and select a gamification tool– Kahoot! and Socrative – Which was feasible to implement in GSS Jain Gurukul Cambridge International Residential School, Chennai, India.

METHOD

The study examines the possibilities of assessments in Kahoot! and Socrative as shown below.

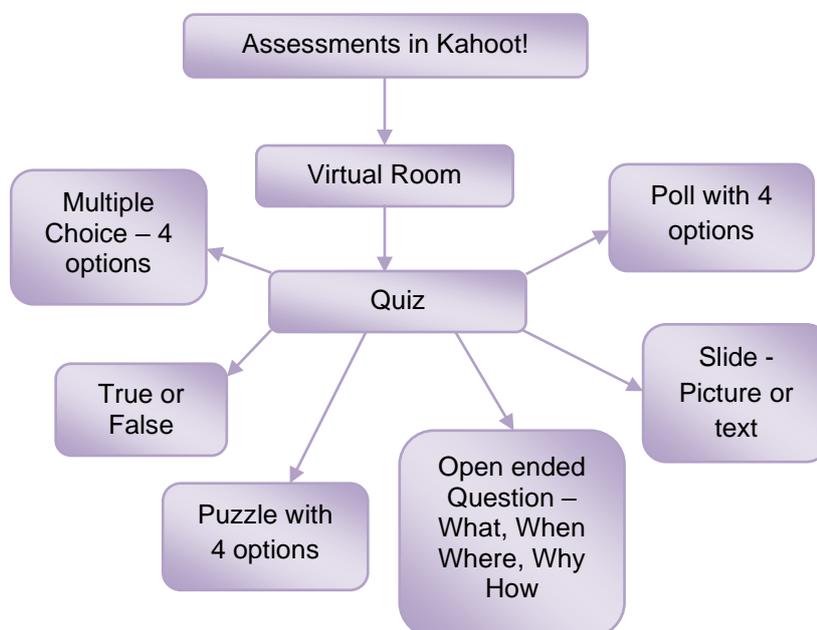


CHART 1 POSSIBILITY OF ASSESSMENTS IN KAHOOT!

Chart 1 above represents the structure of assessments that are possible in Kahoot!. In teaching profession had challenges in engaging and assessing students in classroom activities, especially in assessing graphics-oriented subjects like creative publications and 2D

and 3D designing software in higher education, and in mathematics and computer science in middle and secondary education. Kahoot will enable teachers to test their student's knowledge effectively and interactively using various options for assessments in Quiz.

On 12th January 2019, with great challenges (organized laptops for seven students and provided Internet connectivity), a gamification activity was implemented in GSS Jain Gurukul Cambridge International Residential School. The School Principal Dr. Manoharan was personally invited to visit the class during the activity to assess the performance of students online. The outcome of the activity was successful and effective. Students provided online feedback on Kahoot.

- 1) How fun was it? 5 out of 5 on the scale
- 2) Did you learn something? 100% yes
- 3) Do you recommend it? 100% yes
- 4) How do you feel? 100% (positive results)

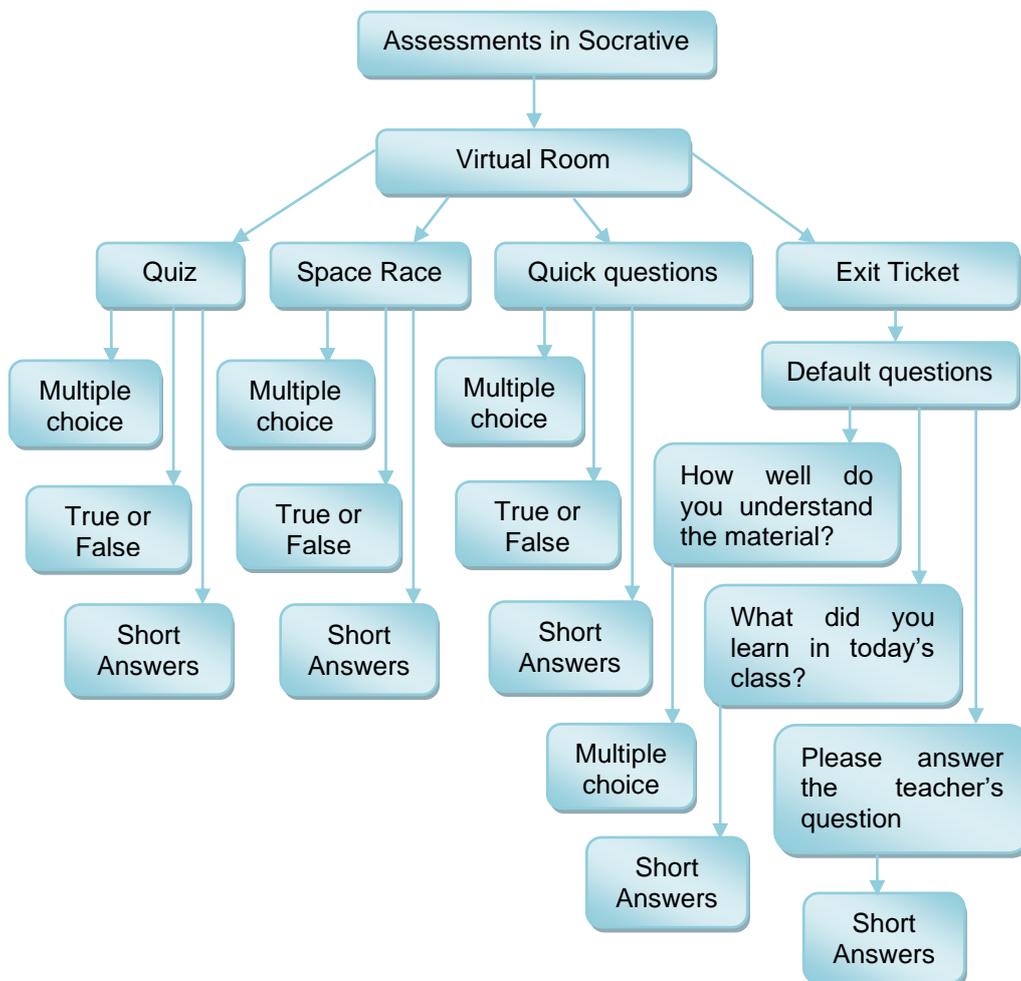


CHART 2 POSSIBILITY OF ASSESSMENTS IN SOCRATIVE

Chart 2 above represents the structure of assessments that are possible in Socrative. Socrative will enable teachers to test their student's knowledge effectively and interactively using assessments like Quiz, Space Race, and Quick Questions.

This section is focused on how to prepare questions to assess students interactively in Socrative. This can be used in various subjects, enabling student participation, engaging, and testing their knowledge in a particular chapter. In the subject of Computer Science, students got challenges in understanding programming concepts. Socrative enables students to overcome such challenges, even if they are wrong with their answers, as it provides rapid feedback for a particular question and enables them to learn.

On 24th July 2019, Socrative was introduced in the GSS Jain Gurukul Cambridge International Residential School (Gurukul, 2019) for Secondary students. As part of formative assessments, the activity was designed using Socrative to conduct **Quiz, Space Race,** and **Exit ticket** in the form of multiple-choice, true or false, and short answers for a particular chapter.

The activities were conducted in a classroom using a smartboard device, and students used their laptops to participate in the activities as individuals. All these devices were connected to the internet which enabled students to login using the virtual room created in Socrative. The delivery method of the **Quiz** activity was teacher-paced; it allowed teachers to know the participation of students before moving to the next question and it even allowed us to give rapid explanations for students with a show/hide explanation option. This enables students to learn and understand if their answers are wrong.

The **Space Race** activity allowed students to select the team color based on their choice given by the teacher, or a self-assign option can be used. In this activity students really had fun and joy in their participation and it engaged them with real-time feedback on the smartboard, as a race of rockets moves based on their correct answers. This activity allowed students to answer the questions at their own pace.

The **Exit Ticket** activity allows teachers to get feedback from students on every session and it is designed with default questions and instructions: 1) how well do you understand the material? 2) what did you learn in today's class? 3) please answer the teacher's question. This enables the teachers to create their own questions to get feedback from students. In Socrative, students can respond with their answers, opinions, ideas, and creativity through text or short answers, true/false, and multiple choice. Teachers can perform assessments in individual or group activities, or even divide assessments into smaller groups of activities.

The output of these interactive activities (Quiz, Space Race, and Exit Ticket) will have end results in the form of reports (get reports or view chart). These reports are in the form of an excel sheet for the whole class, individual student feedback in a pdf file, and a question-based report also in a pdf file. These can be sent through e-mail or downloaded and they can even be shared on Google Drive. All these options are available in Socrative. The other option for the report is a view chart: this will display in the form of table format with options (enable/disable) of student names and their answers. These reports are rapid feedbacks from Socrative.

On 26th July 2019, **questionnaire 2** was applied to grade nine GSS Jain Gurukul Students to collect feedback based on the usage of online gamification tools (Kahoot! and Socrative) in-class activities. The objectives are as follows.

RESEARCH QUESTIONS (QUESTIONNAIRE 2)

1. Are you able to pick up easily the rules, procedures and the interface of Kahoot! and Socrative tools?
2. Did the tool Kahoot! and Socrative encourage you for well participation in class room activities?
3. Are you able to engage in all activities conducted using Kahoot! and Socrative tools?
4. Is the tools (Kahoot! and Socrative) motivates you to learn the subject?
5. Is the tools helped you to develop self confident in learning?
6. Does the tool help you to develop your creative thinking?
7. Did you feel enthusiasm in learning using Kahoot! and Socrative tools in classroom activities?
8. Which tool you prefer as the most interesting for classroom activity?
 a) Kahoot! b) Socrative
9. Which activity you liked and enjoyed the most in Socrative?
 a) Quiz b) Space Race c) Exit ticket
10. Are you willing to learn your subjects using gamification tools?

RESEARCH OBJECTIVES (QUESTIONNAIRE 2)

1. To confirm the interface (Kahoot! and Socrative) is easy to use.
2. To test students' participation in the classroom using gamification tools.
3. To assess students' engagement in the classroom during the activities.
4. To test motivation of students in learning using gamification tools.
5. To analyze self confidence in learning using gamification tools.
6. To analyze initiative and creativity in learning.
7. To analyze enthusiasm in learning using gamification tools.
8. To identify the most interesting tool between Kahoot! and Socrative.
9. To check the most enjoyed and liked activity in Socrative.
10. To test students' willingness to use gamification tools.

The data is displayed below in Table 4, with Likert scale measures for questions 1 to 7 and 10. Questions 8 and 9 were used to identify the most interesting tool and enjoyed activity in class.

TABLE 4: QUESTIONNAIRE 2 DATA FOR GRADE 9 STUDENTS

Students	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Student 1	SA	SA	A	SA	A	SA	SA	Socrative	Space Race	A
Student 2	SA	SA	A	SA	A	SA	SA	Kahoot	Space Race	A
Student 3	SA	SA	A	SA	A	SA	SA	Socrative	Quiz	A
Student 4	SA	Kahoot	Quiz	A						
Student 5	SA	Kahoot	Quiz	SA						
Student 6	SA	Kahoot	Quiz	SA						
Student 7	SA	SA	A	SA	A	SA	SA	Kahoot	Space Race	A

In the table above, Questions Q1, Q2, Q4, Q6 and Q7 represent the **Strongly Agree** category in the Likert scale and for the questions Q3 and Q5 data of cumulative response was added (0, 0, 0, 4, 7) to find the median. The position value is calculated using the formula $(n+1)/2$ that are $(7+1)/2 = 4$ which falls in the **Agree - 4** category of the scale for the objectives. Question 10 cumulative responses was added (0, 0, 0, 5, 7) and the median falls in the **Agree - 4** category in the Likert scale.

Below we show the consolidated summary report of the questionnaire 2 after finding the median for every objective.

1. To confirm the interface (Kahoot! and Socrative) is easy to use. - Strongly Agree
2. To test students' participation in the classroom using gamification tools. - Strongly Agree
3. To assess students' engagement in the classroom during the activities. - Agree
4. To test motivation of students in learning using gamification tools. - Strongly Agree
5. To analyze self confidence in learning using gamification tools. - Agree
6. To analyze initiative and creativity in learning. - Strongly Agree
7. To analyze enthusiasm in learning using gamification tools. - Strongly Agree
8. To identify the most interesting tool between Kahoot! and Socrative. - 4:3 ratio
9. To check the most enjoyed and liked activity in Socrative. - 4:3:0 ratio
10. To test students' willingness to use gamification tools. - Agree

1. To confirm the interface (Kahoot and Socrative) is easy to use. Students strongly agreed on this objective. During the activities in class, students were able to interact with the interface (Kahoot! and Socrative) easily without the support of the teacher. The interface designs are consistent in appearance and behavior. Students were able to focus on their tasks, and they were not distracted by sudden changes in the interface.

2. To test students' participation in the classroom using gamification tools. Students strongly agreed on this objective. During the regular class hours, students approached repeatedly insisting to conduct online activities. This shows that students were interested and willing to participate in online activities more often.

3. To assess students' engagement in the classroom during the activities. Students agreed on this objective. **Game dynamics** in the tools (Kahoot! and Socrative) allow students to interact actively to participate in the activity. Feedback provides students to understand where they are, their current status, what they can do next, and even to know when they have finished the activity.

4. To test the motivation of students in learning using gamification tools. Students strongly agreed on this objective. Concepts of **game mechanics** and **game dynamics** in Kahoot! and Socrative tools allow students to participate, engage well and encourage them in learning.

5. To analyze confidence in learning using gamification tools. Students agreed on this objective. When the activity was repeated, students were very confident and performed in the activity very well. They remember what they have learned in previous activities.

6. To analyze initiative and creativity in learning. Students strongly agreed on this objective. The interface is aesthetically pleasing and user-friendly for students to take initiative to interact

with the system. The tool can develop student potential that lies within the student and also help them to develop their innate inner potential, which makes them creative in their learning.

7. To analyze enthusiasm in learning using gamification tools. Students strongly agreed on this objective. Game dynamics in the tools (Kahoot! and Socrative) support students with their actions and responses in the form of points and trophies. Students' facial expressions and tone of voice indicated their enthusiasm for learning.

8. To identify the most interesting tool between Kahoot! and Socrative. The data shows that 4:3 ratios of students were more interested in Kahoot! than in Socrative. The background music in Kahoot! gives a more lively effect for students.

9. To check the most enjoyed and liked activity in the Socrative tool. The data shows that the 4:3:0 ratio of students, the Space race activity was most enjoyed and liked over the Quiz and Exit ticket activity.

10. To test students' willingness to use gamification tools. Students agreed on this objective. In-class observation, students approached very often to conduct online activities in Kahoot! and Socrative and even requested to introduce new online activities.

Questionnaire 2 was not able to conduct for Grade 7 students of GSS Jain Gurukul due to the shortage of laptops in the Institution and technical faults in the existing laptops.

CONCLUSION

This research study enhanced the teaching profession in engaging and assessing students in classroom activities using technology. Kahoot! and Socrative provided ample interactive assessment possibilities to conduct in the classroom, in which the Kahoot! transforms the classroom lively and enhances students' participation effectively. In Socrative, Space Race activity gave more gamification feel to the students. A rapid feedback option in the tool is a benefit for students to learn effectively and for teachers to assess students easily. Some of the challenges to conducting interactive assessments in the classrooms where the need for institutions to invest in the latest technology in the classrooms and teachers must be trained to use such tools in their practice.

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