Title of the scenario:

Triseum games – reaching the infinite

Names of author(s)

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Relevant Trend/s

Write the trend(s) or trends the Scenario is intended to respond to.
e.g. http://www.allourideas.org/trendiez/results

Games and Gamification is one of the important Developments in Educational Technology for European Schools.

Studies have shown that educational video games can enhance the learning of students (Ebner & Holzinger, 2007, and increase their intrinsic motivation, which improves learning performance in the absence of any apparent external contingency (Deci & Ryan, 1980: cited in Gunes, A.)

Digital game-based learning (DGBL) is a competitive activity in which students are motivated and set educational goals intended to promote knowledge acquisition (Erhel& Jamet, 2013). A recent study shows the positive relationship between the level of motivation and the learning scores in a digital game based learning environment (Liu, Horton, Olmanson & Toprac, 2011).

Game-based learning (GBL) has become an effective training and learning method that both students and teachers enjoy being part of these days. GBL have been developed and help students around the world acquire the knowledge and skills they need to live an educated life with a wide ranges of benefits (Clark, M.)

The Zones of Game Variant Limits based on Bloom's Taxonomy of Educational Objectives By Bloom's Taxonomy, teachers could access a multi-tiered scale to express the level of expertise required to achieve each measurable student outcome. Organizing measurable student outcomes in this way will allow us to select appropriate classroom assessment techniques for the course.

Visual graphs provide clues that words and equations don't. For example, it might take middle school or high school students several minutes to read, digest, interpret and map a word problem. With graphical representations can quickly draw conclusions. Graphs show trends, gaps and clusters, and compare multiple data sets at once, often accommodating large sets of data. They make it easy for scientists and students alike to form hypotheses and draw conclusions.

Finally Variant Limits could be used for Flipped Classroom Teaching. Students work and play games as homework at home and in classroom with the teachers, could evaluate their knowledge of levels with worksheets. It is a combination of direct teaching and constructive learning with the teacher, is not the "wise on the stage", but the "sage on the stage", the "guide

on the side". Students who are absent due to illness or extracurricular activities, such as sports, do not stay behind. All pupils are actively involved in learning by personalized training. The game is a tool to increase interaction and personalized contact time between students and teachers,an environment where students are responsible for their own learning.

As summary the trends that this scenario respond to are:

➢ Flipped Classroom: students master basic concepts of topic at home. Time spent in classroom is used to reflect, discuss, develop topic.
➢ Game Based Learning & Gamification: learning is mixed with games or with game mechanism
➢ STEM Learning: Increased focus on Science, Technology, Engineering, Mathematics subjects in the curriculum
➢ Edutainment: playful learning. Learning while having fun.
➢ Personal Learning Environment: the online learning environment you engage with is tailored to your personal needs.
➢ Social media is changing the way people interact, present ideas and information, and communicate.
➢ Visual Search & Learning: images and multimedia are more powerful than verbal stimuli.
➢ Outdoor Education: learning outside of the school building in the "real" environment
➢ Peer Learning: students learn from peers and give each other feedback.
➢ Virtual Learning Assistant: learning on demand. Students find online help when needed.

Learning Objectives and Assessment

What are the main objectives? What skills will the learner develop and demonstrate within the scenario? (e.g. 21st Century Skills). How will the progress in achievement be assessed, ensuring the learner has access to information on their progress so they can improve?

1. Cultivation analytical and critical-thinking skills to look for patterns in data, trying to determine what those patterns mean, and then using that data to support a claim. (*Students need the ability to think analytically, which includes proficiency with comparing, contrasting, evaluating, synthesizing, and applying without instruction or supervision.*
2. Flexibility
3. Cognitive objectives

➔ Determination function behaviors as x infinitely increases or decreases. Analyze.
➔ Identification vertical asymptotes and oscillating behaviors of functions
➔ By solving exercises to worksheet students self evaluate their knowledge.

Learner's Role

What sort of activities will the learner be involved in?

Pre-knowledge/ Requirements: The notions of limits , experience in calculation limits via graphs of function.

Students take an active role and following inquiry learning process they solve [Puzzles of Zone 4](#).
They solve exercises using algebraic representation of functions.

Tools and Resources

What resources, particularly technologies, will be required?

- Download the software Variant Limits of Triseum https://triseum.com/variant-limits/
- Worksheets,
- Download the software geogebra (www.geogebra.org)
- Online communication tools as padlet (www.padlet.com) or wikispaces (www.wikispaces.com)
- Video : What is Zeno's Dichotomy Paradox? - Colm Kelleher. View full lesson: http://ed.ted.com/lessons/what-is-zen…
- Problem in geogebra :Geometrical aproach of limit to infinity Sollution
- Geogebra as the limit of sequence in infinity

- Worksheet for solving exercises

Learning space

Where will the learning take place e.g. school classroom, local library, museum, outdoors, in an online space?

School computer laboratories and personal computer devices working without school classroom.

Future Classroom Scenario Narrative

Describe the main ideas of the scenario.

This scenario is based on teaching and learning mathematics through Games. The educational software of Variant Limits Triseum https://triseum.com/variant-limits/ is an interactive learning process in Mathematics. It includes a collection of games (four Zones with different Puzzles) with targeted calculus learning objectives. The structure of zones in the learning process is presented here.

This scenario is focused on (Zone 4) the concept of infinity in mathematics. Using graphical representations of functions in Puzzles of the game for calculation limits to infinity, students manipulate objects within the 3D world using calculus principles and theories. Players are immersed in an environment that includes an engaging narrative, hidden backstory, and a high-stakes adventure. Intuitive feedback and game interaction allow players to play and explore at their own pace. Intelligent game analytics allow instructors to monitor student activity and provide insight into student progress. The inquiry learning process is: 1) Starting of an geometrical problem: students get familiar with the concept of infinity in mathematics 2) Exploring and investigating the puzzles of games: students search for limits of functions to

infinity, 3) Assuming the results based on the graphical representation of algebra formula with educational software geogebra in the reversal progression for solving exercises.

Learning Activities

Link to the Learning Activities created with Learning Designer (http://learningdesigner.org)

https://v.gd/V8MgLm

References

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