

Serious games

in child & adolescent psychiatry

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definition

- ▶ Video games designed for purposes such as **education, training, or behavior modification**
- ▶ Serious: "purposeful, intentional, Beyond entertainment and carefully thought-out educational purpose "
- ▶ Unlike traditional games, which prioritize fun, serious games focus on **learning or practicing skills**

History

- ▶ **Clark C Abt**: creation of the term in 1970
(German-born American researcher)

Key component

▶ Gameplay machine

Arcade game or coin-op game

- ✓ Coin-operated entertainment machine
- ✓ In public businesses such as restaurants, bars and amusement arcades
- ✓ Most arcade games are presented as primarily games of skill
- ✓ Include arcade video games, pinball machines, electro-mechanical games, merchandisers

Key component

▶ Gameplay machine

❖ Arcade video games

- ✓ Takes player input from its controls
- ✓ Processes it through electrical or computerized components
- ✓ Displays output to an electronic monitor



Key component

▶ Gameplay machine

❖ Electro-mechanical games

- ✓ Types of arcade games
- ✓ Combination of some electric circuitry and mechanical actions from the player to move items contained within the game's cabinet



Key component

- ▶ **Gameplay machine**
 - ❖ **Merchandise games**
 - ▶ A machine that contains a display of merchandise
 - ▶ Which can be won by playing the game
 - ▶ Hybrid of games of skill and games of chance



Key component

▶ Gameplay machine

❖ Pinball machines

- ❖ A ball is propelled into a specially designed table
- ❖ Where it bounces off various obstacles
- ❖ Scoring points either en-route or when it comes to rest
- ❖ Hitting various lights, bumpers, ramps, and other targets depending on its design



Key component

- ▶ Gameplay machine
 - ❖ Pachinko
 - ▶ Mechanical game originating in Japan
 - ▶ An arcade game
 - ▶ Much more frequently, for gambling



Key component

▶ Gameplay machine

- ❖ Slot machines
- ✓ Gambling machine
- ✓ Game of chance



Key component

▶ Gameplay machine

❖ Carnival games

- ✓ Game of chance or skill
- ✓ Operated on a "pay per play" basis



Key component

- ▶ Gameplay machine
- ▶ Learning outcome
- ▶ Engagement factor

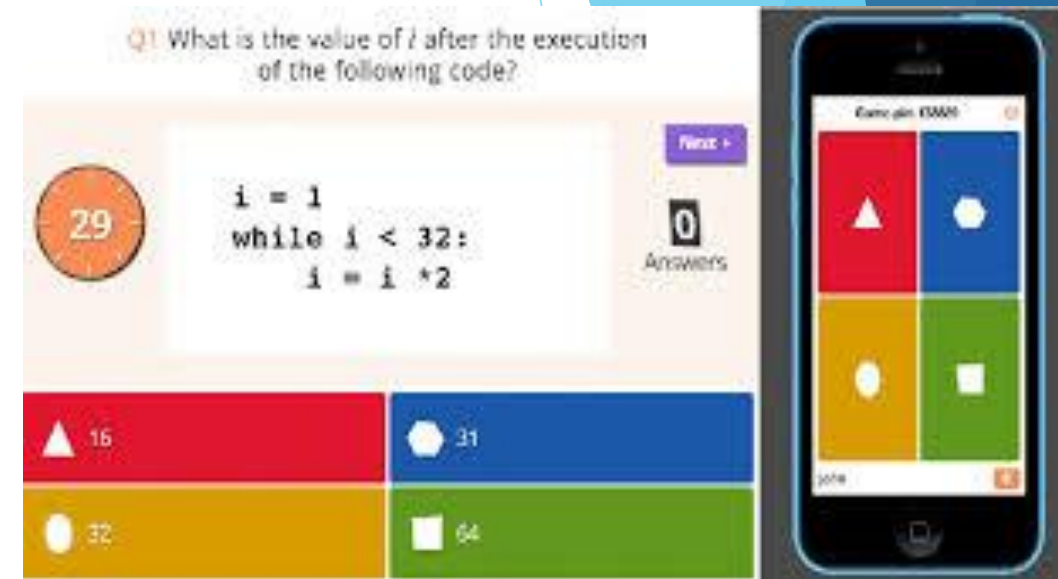
Types of serious games

1-Educational games:

Focus on teaching academic concepts

Kahoot

- ✓ Norwegian online game-based learning platform
- ✓ Has learning games, known as "kahoots"
- ✓ which are user-generated multiple-choice quizzes
- ✓ Can be accessed via a web browser or the Kahoot! app



Types of serious games

1-Educational games:

Focus on teaching academic concepts

Kahoot

- ✓ Game-based histology and cell biology lab(Egypt)
- ✓ Equipped with light and electron microscopic photos
- ✓ Applied for 2nd year undergraduate medical students
- ✓ Students' engagement was evaluated by calculating number of engaged students in Kahoot versus number of attended students in each lab



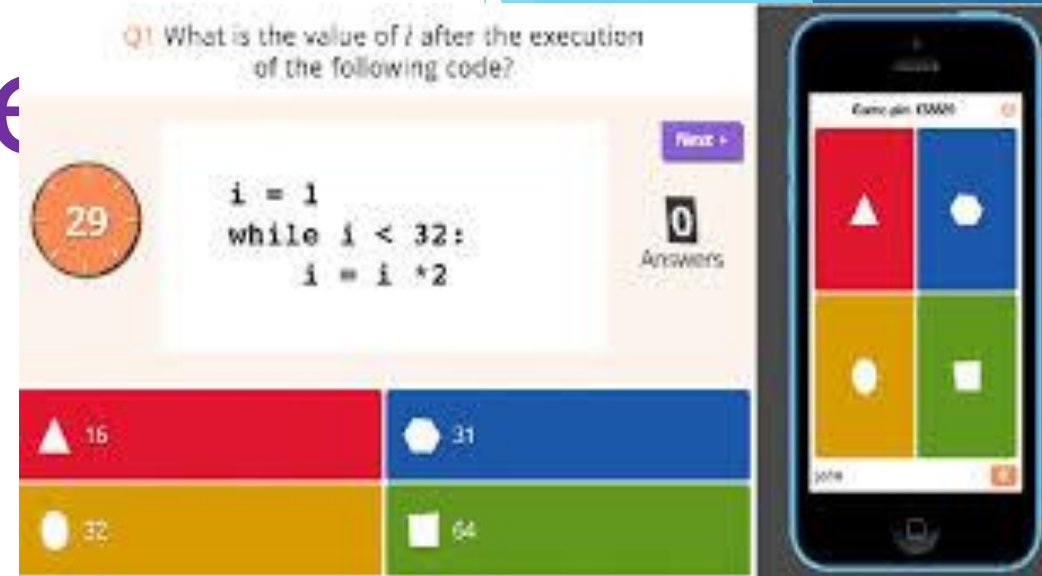
Types of serious game

1-Educational games:

Focus on teaching academic concepts

Kahoot

- ✓ Kahoot was successfully applied in Histology and Cell Biology lab sessions
- ✓ Students' engagement for Kahoot game-based formative assessments were 100% in most lab sessions
- ✓ Most students recommended the use of Kahoot game-based formative assessments



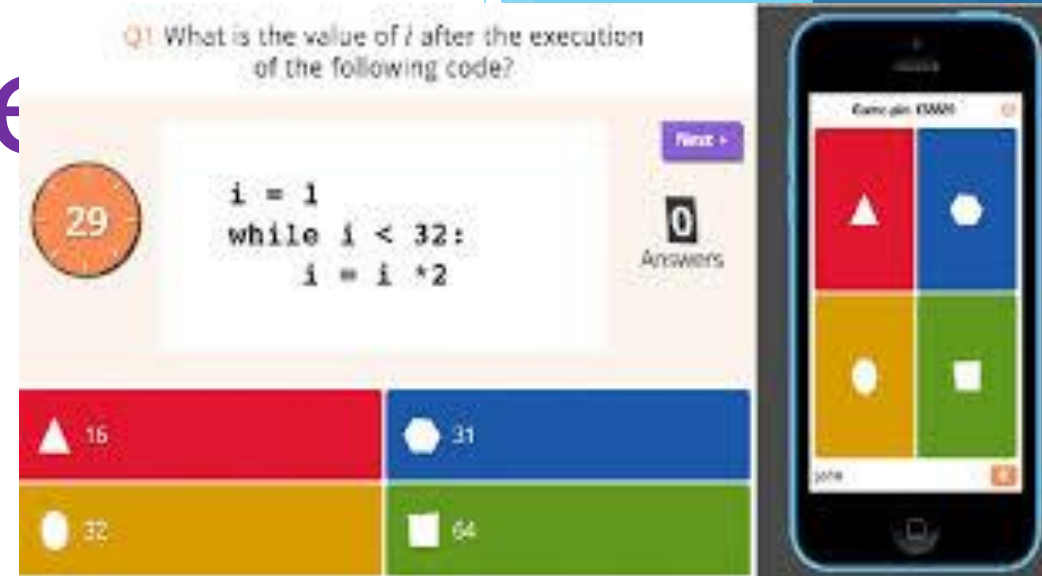
Types of serious games

1-Educational games:

Focus on teaching academic concepts

Kahoot

- ✓ Kahoot produces marked students' engagement and satisfaction in formative assessments
- ✓ Enabling it to be applied live for any learning session either face to face or virtual for distance learning



Types of serious games

1-Educational games:

Focus on teaching academic concepts

Minecraft education edition

- ✓ digital game-based learning platform



Types of serious games

1-Educational games:

Focus on teaching academic concepts

Minecraft education edition

- ✓ Explore primary students' experiences of using Minecraft Education during an innovative national project-based initiative(Irish)
- ✓ The initiative had two phases:
 - 1) Educational episodes for teachers and students on how to use the platform
 - 2) A national competition that required students to re-imagine a sustainable version of their community



Types of serious games

1-Educational games:

Focus on teaching academic concepts

Minecraft education edition

- ✓ Third to sixth class students ($N = 173$) completed a survey that examined:
- ✓ 1) learning opportunities with Minecraft Education
- ✓ 2) ease of use
- ✓ 3) usefulness
- ✓ 4) enjoyment



Types of serious games

1-Educational games:

Focus on teaching academic concepts

Minecraft education edition

- ✓ Eight focus group interviews were then conducted with a subsample of sixth class students ($n = 30$)
- ✓ Students indicated :
 - 1) There were good opportunities for learning with Minecraft Education, particularly for creativity and collaboration
 - 2) The platform was easy to use and useful
 - 3) Using Minecraft Education was enjoyable



Types of serious games

2-Training stimulation:

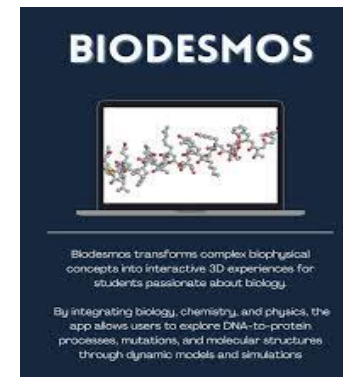


Used in professional settings to train employees

Flight stimulators

Medical training programs

BioDesmos, mutation mystery, *Green Intelligence*



Types of serious games

3-Health games:

Promote health awareness ,behavior change
,physical activity

MyFitnessPal



Types of serious games

4-Social impact games:

Raise awareness about social issues

Spent (poverty)



Why use serious games in psychiatry?

- ▶ Innovative approaches to treatment and prevention for various mental health conditions
- ▶ Engaging child & adolescent in mental health treatment through play can enhance therapeutic outcome
- ▶ depression, anxiety, ADHD, and ASD, as well as promoting cognitive development, social interaction and emotional regulation

Why use serious games in psychiatry?

- ▶ Depression
- ▶ Anxiety
- ▶ ADHD
- ▶ ASD
- ▶ Promoting cognitive development, social interaction, emotional regulation

Developmental Disorders

Peter Kokol et al 2020(1)

□ ASD

1-Facial Expression and Emotions Recognition

▶ *JeStiMule* (2)

- ✓ Teaching emotion recognition



Developmental Disorders

Peter Kokol et all 2020(1)

□ ASD

1-Facial Expression and Emotions Recogniti

▶ *JeStiMulE* (2)

- ✓ Assess the ability of children to play the game and improvement and development of social skills via recognition facial emotions (Morocco)
- ✓ 40 children & adolescents with ASD AND 40 normal control
- ✓ 2 one-hour/week JeStiMulE sessions
- ✓ All participants were presented before and after training with emotion recognition tasks



Developmental Disorders

Peter Kokol et al 2020(1)

□ ASD

1-Facial Expression and Emotions Recognition

▶ *JeStiMule* (2)

- ✓ Descriptive data
- ✓ Overall enhancing at the recognition of facial emotions
- ✓ Jestimule exhibited encouraging results in terms of recognition of emotions and thus would help children to extend this acquisition to the real-life world



Developmental Disorders

Peter Kokol et al 2020(1)

□ ASD

2-Enhanced body language/eye gaze recognition & adaptive socialization

▶ *LIFEisGAME* ⁽³⁾

- ✓ To enhance facial and emotional recognition skills (Portugal)
- ✓ Assess motivation to play, game usability, participants' emotional recognition abilities and technology usage
- ✓ People with autism are less likely to gaze at faces and are also impaired in face discrimination tasks



Developmental Disorders

Peter Kokol et al 2020(1)

□ ASD

2-Enhanced body language/eye gaze recognition & adaptive socialization

▶ *LIFEisGAME* ⁽³⁾

- ✓ a 15 minute game session
- ✓ 11 children with ASD
- ✓ 5-15 years old
- ✓ 91% were male and 9% were female
- ✓ 82% were verbal ASD and 18% were non-verbal ASD



Developmental Disorders

Peter Kokol et al 2020(1)

□ ASD

2-Enhanced body language/eye gaze recognition & adaptive socialization

▶ *LIFEisGAME* ⁽³⁾

- ✓ Therapists' opinions (n = 8) about the game were given during an unstructured interview
- ✓ The game was presented on an Ipad
- ✓ All participants had experience with computer games



Developmental Disorders

Peter Kokol et al 2020(1)

□ ASD

2-Enhanced body language/eye gaze recognition & adaptive socialization

▶ *LIFEisGAME* ⁽³⁾

- ✓ qualitative analysis
- ✓ All participants seemed to enjoy the prototype game and used the 15 minutes of play time
- ✓ Favourite game mode was the “Memory Game”
- ✓ The game mode with the most enjoyment, promoting smiles and laughter, was the “Sketch Mee”



Developmental Disorders

Peter Kokol et al 2020(1)

□ ASD

2-Enhanced body language/eye gaze recognition & adaptive socialization

▶ *LIFEisGAME* ⁽³⁾

- ✓ Some excitement and stereotyped behaviours were observed
- ✓ all participants stayed in the room
- ✓ None were involved in aggressive behavior
- ✓ Adding sounds effects (immediately after winning/losing points) increase motivation
- ✓ The rewards should be mainly visual (stars, toys) and less numeric (score)
- ✓ Feedback also needs to be positive (negative can lead the child to frustration)



Developmental Disorders

Peter Kokol et al 2020(1)

□ ASD

2-Enhanced body language/eye gaze recognition & adaptive socialization

▶ *LIFEisGAME* ⁽³⁾

- ✓ game was highly usable
- ✓ All children were able to start/re-start and finish the prototype game and game modes, choose different difficulty levels and change game mode
- ✓ Difficulties in recognising and expressing emotions
- ✓ Happiness and sadness were the easiest emotions to play with
- ✓ In opposition to anger and disgust
- ✓ Effective intervention methods to overcome these difficulties



Developmental Disorders

Peter Kokol et all 2020(1)

□ ASD

2-Enhanced body language or eye gaze recognition and adaptive socialization

▶ *Emotioplay* (4)

- ✓ A cross-cultural evaluation (in the UK, Israel and Sweden)
- ✓ a system aimed to teach emotion recognition (ER) to children
- ✓ Participants were 6-9 year olds with high functioning ASD
- ✓ who used the SG for 8-12 weeks



EmotiPlay

Developmental Disorders

Peter Kokol et all 2020(1)

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EmotiPlay

Developmental Disorders

Peter Kokol et al 2020(1)

□ ASD

2-Enhanced body language or eye gaze recognition and adaptive socialization

▶ *Emotioplay* (4)

- ✓ significantly improved participants' performance on ER body language and integrative tasks, adaptive socialization
- ✓ reduced autism symptoms after using the SG (in the Israeli)
- ✓ effective and motivating psycho-educational intervention, cross-culturally teaching ER from faces, voices, body language, and their integration in context to children with high functioning ASC



EmotiPlay

Developmental Disorders

Peter Kokol et al 2020(1)

□ ASD

3-how to produce facial expressions

▶ *JEMImE* (6)

(Children have to perform facial expressions on request or based on social situations)

4-Teaching and practicing social interactions

▶ *ECHOES* (7)

(Simulated activities take place in a so-called sensory garden. Activities are supported by a virtual agent who acts as best practice skilled social partner)



Developmental Disorders

□ ADHD

1-Improvement in working memory

➤ *CWMT*

- ✓ Cogmed Working Memory Training (CWMT)
- ✓ systematic review
- ✓ up to January 14, 2024
- ✓ age 18 years or older
- ✓ The primary outcomes were post-training verbal and visuospatial WM performance
- ✓ A total of 298 articles



Developmental Disorders

□ ADHD

1-improvement in working memory

➤ *CWMT*

- ✓ significant improvements in verbal and visuospatial WM scores immediately after training
- ✓ with a small effect for sustained benefits for verbal WM at 2-6 months post-intervention
- ✓ No significant differences were observed between groups less than 2 months post-training for either WM component
- ✓ CWMT provides short-term benefits for adults' WM, particularly immediately after training
- ✓ Evidence for sustained improvements remains limited.



Developmental Disorders

□ ADHD

2-improvement in attention and cognitive control

➤ *EndeavorRx*

- ✓ AKL-T01 is a digital therapeutic (DTx) that targets attention, during a multitasking game
- ✓ Clinical trials support AKL-T01's efficacy in ADHD



Developmental Disorders

□ ADHD

2-improvement in attention and cognitive control

➤ *EndeavorRx*

- ✓ Between July 15, 2016, and Nov 30, 2017
- ✓ 857 patients were evaluated and 348 were randomly assigned to receive AKL-T01 or control
- ✓ The mean (SD) change from baseline on the TOVA API was 0·93 (3·15) in the AKL-T01 group and 0·03 (3·16) in the control group
- ✓ There were no serious adverse events or discontinuations
- ✓ Treatment-related adverse events were mild and included frustration (5 [3%] of 180) and headache (3 [2%] of 180)
- ✓ Patient compliance was a mean of 83 (83%) of 100 expected sessions played



Developmental Disorders

□ ADHD

3-emotional regulation

➤ *Mightier*



Developmental Disorders

□ ADHD

4-Improve emotional regulation, working memory and inhibition

➤ *The secret trail of Moon*

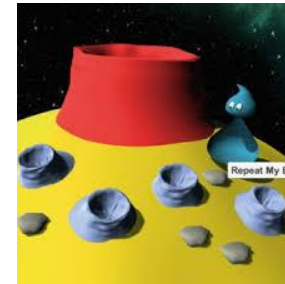


Developmental Disorders

▶ ADHD

5-improve attention and coordination through rhythmic task

➤ *ADDenturous Rhythmical planet*



6-self- control, rule-following, attention and concentration

➤ *BRAVO Project*

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