Pros and Cons of VR/AR and Gamification
Is it steak or sizzle?
(Roundtable discussion)

Facilitator/Moderator

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Topics for Discussion

- What is VR, AR & Gamification?
- Pros and cons of AR,VR and Gamification
- Evaluation results
- Tools

What is VR/AR and Gamification?

- **Virtual reality and** Augmented reality allow users to interact with computer-simulated environments, real or imagined. VR also enables users to experience visual, auditory, tactile, smell, and taste inputs in a three-dimensional space.

- Gamification of e-learning is the application of game elements & gaming techniques to non-game elements (online learning content) in an effort to make it fun & engaging.

- VR/AR and Gamification is a great way to add interest and engagement to e-learning.

KEY DIFFERENCES between VR and AR

- AR augments the real-world scene whereas VR creates completely immersive virtual environments.
- AR is 25% virtual and 75% real while VR is 75% virtual and 25% real.
- In AR no headset is needed on the other hand in VR, you need headset device (Oculus).
- With AR, end-users are still in touch with the real world while interacting with virtual objects nearer to them, but by using VR technology, VR user is isolated from the real world and immerses himself in a completely fictional world.
- Augmented Reality is Less expensive to create than Virtual Reality

Advantages of Augmented Reality (AR)

Here, are pros/benefits of augmented reality:

- Offers individualized learning
- Fostering the learning process
- Wide variety of fields
- Offers innovation and continuous improvement
- Increase accuracy
- Augmented reality can be used to increase user knowledge and information
- People can share experiences over long distances
- Helps developers to build games that offer "real" experience to the user

Advantages of Virtual Reality (VR)

■ **Here, are pros/benefits of virtual reality:**

- Immersive learning
- Create an interactive environment
- Increase work capabilities
- ✓ Offer convenience
- One of the most important advantages of VR is that it helps you to create a realistic world so that the user can explore the world
- Virtual reality in the education field makes education more easy and comfortable
- Virtual reality allows users to experiment with an artificial environment

Disadvantages of Augmented Reality

■ **Here, are cons/drawback of Augmented Reality:**

• It is very expensive to implement and develop AR technology-based projects and to maintain it.

• Lack of privacy is a major drawback of AR.

• The low-performance level of AR devices is a major drawback that can arise during the testing phase.

• Lack of security may affect the overall augmented reality principle.

• Augmented reality can cause mental health issues.

• Extreme engagement with AR technology can lead to major healthcare issues such as eye problems and obesity etc.

Disadvantages of Virtual Reality

■ **Here, are cons/drawbacks of virtual reality:**

• It is very expensive to implement and develop and to maintain it.

• The escapism is commonplace among those that use VR environments, and people start living in the virtual world instead of dealing with real-world issues.

• Training with a VR environment never has the same result as training and working in the real world. This means if somebody has done well with simulated tasks in a VR environment, there is still no guarantee that a person will be doing well in the real world.

Games vs Gamification
Pros and Cons

Games are non-productive and participation therefore does not accomplish anything useful.

Gamification can prove the opposite. The definition of "gamification" should thus be amended to "Gamification is the use of game elements in contexts that originally had no link to game-related elements." The more non-game-related elements receive gamificational treatment, the more they drift towards game-related elements. Therefore, gamification can be considered a virus.

Still, it is also important to pay attention to the fact that games are addictive. Students who already are or easily tend to become addicted have to be treated differently. It does not make any sense to use gamified content with them since they will happily take this opportunity to turn their attention away from the educational purpose. On the other hand, this might be an opportunity to lure them away from their addictive behavior. In this case gamification could turn into a "bridge" back to the real world.

Game-based Learning

- **Game-based learning** is a form of game play with specific learning outcomes; it is typically instructionally designed to provide a balance between subject matter that needs to be learned, playing games, and the capability of the learners to apply the knowledge and skills in the real world.

- Virtual Worlds with simulations could permit learners to tinker with chemical reactions, practice operating or performing an experience.

- Games help players to develop and exercise a skill including planning, thinking using technical skills, collaboration, etc.

Examples

- Dusty the Dragon
  (AR virtual world)

- 1UpOnVaping
  (AR virtual world and Gamification)

Dusty the Dragon Results

	CVA 5TH	Amery I	HUDSON	Amery II	CVA4TH
pre-test(mean)	6	5.89286	5.75	5.0689	4.6363
post-test(mean)	7.6363	7.75	7.91667	8.68966	6.0909

School	Percentage increase of mean from pre to post test
Amery class1: 5th grade	19% increase
Amery class2: 5th grade	37% increase
Hudson: 6th grade	22% increase
CVA class1: 5th grade with many special needs students	16% increase
CVA class2: 4th grade	15% increase

1UponVaping Results

School	Percentage increase/decrease of mean pre to posttest INSTRUCTION PROVIDED	Percentage increase/decrease of mean pre to posttest NO INSTRUCTION PROVIDED
Amery, Wi 4th grade		5.4% increase
Amery, Wi 5th grade	7.8% increase	
Cyber Village(CVA) 6th, 8th	-1% decrease	
Cyber Village(CVA) 4th, 5th, 7th		1% increase
Laura Jeffrey 5th, 6th		8.5% increase
Day 1 – St. Louis Park		
St Louis Park 7th grade	7% increase	
St Louis Park 6th grade		.73% increase
Day 2 – St. Louis Park		
St Louis Park 7th grade	7.57% increase	
St Louis Park 6th grade		5.66% increase
St. Joseph Catholic – Colorado 6th,7th,8th		.33% increase
Denver Discovery School – Colorado 6th, 7th, 8th		3.09% increase
Place Bridge – Colorado 6th		4.75% increase
Total Overall mean for all schools	**5.34% increase**	**3.68% increase**

Critical aspects in AR, VR and Game creation

- **Instructional Design**

  Objectives for learning

  Content must provide satisfaction and challenge

  Discovery is important with hints, guidance

  Storytelling and scenarios provide goals and motivation

- **Stimulating questions**

  Scorekeeping may positively impact one type of game or learning style / learner, but may hamper another

- **Feedback**

  Feedback and Guidance are important for learning and for assessing the knowledge and skills

- **Simulations & Augmented Reality-Virtual Worlds**

  Reuse of interface, software objects/characters to provide help/hints and scaffolding for various levels, and leverage the non-sequential, immersive environment / simulations

Tools for Virtual Worlds and Gamification

- Unity
- C#
- Baamboozle – www.bamboozle.com
  Create customizable educational game to use in F2F, hybrid or virtual course
- Kahoot! - Kahoot.com
  Interactive lessons and games/trivia games
- Flippity and Google sheets – www.flippity.net
  flash cards template

THE END