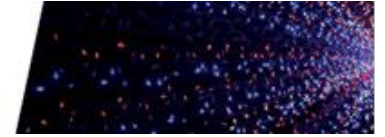


Teaching, learning and personal tutoring: A virtual mini-conference

11 September 2020



**Promoting the use of gamification and digital tools to
develop online learning communities and enhance
student engagement.**

Dr Funmi Obembe
Senior Lecturer in Information Systems

Outline

1 Introduction

2 Gamification

3 Motivation – Intrinsic vs Extrinsic

4 Why it works.. the Neuroscience of Gamification

5 Theoretical Backgrounds for Gamification

6 Gamification Conceptual Framework

7 Implementation on Black Board

8 Next steps

Introduction

- 1 The emergence of COVID-19 has disrupted traditional ways of teaching and learning
- 2 However, as educators this disruption provides us with opportunities to be innovative in our response to the new normal of teaching
- 3 Promoting the use of gamification to increase student engagement and develop online learning communities is one such response

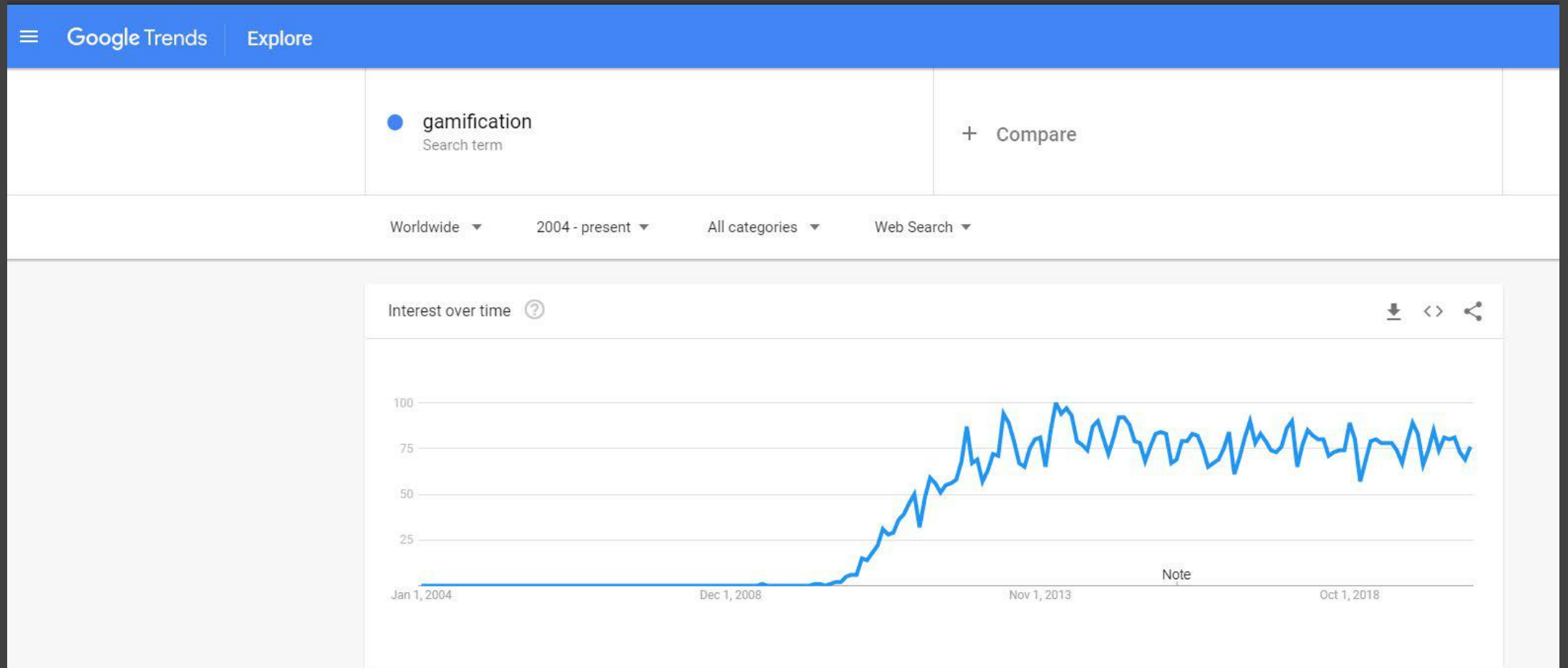
Gamification



- “the use of game mechanics and experience design to digitally engage and motivate people to achieve their goals” (Burke, 2014)
- “the use of game design elements in non game contexts” (Deterding et al., 2011)

Gamification

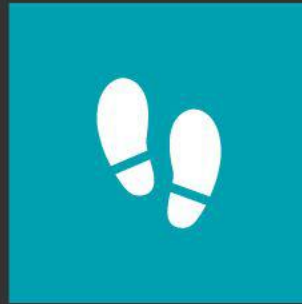
Gamification entered into mainstream vocabulary around 2010



Gamification Examples



Teaching and learning



Global step challenge



Monster guard app - prepares
children for emergencies

Gamification - Global step challenge



[HOME](#) [TERMS & CONDITIONS](#) [PRIVACY POLICY](#) [CONTACT US](#) [Q](#)

Are you ready to step up for your health?

The Step Challenger app is the ultimate corporate exercise buddy for you and your colleagues.

TRACK YOUR STEPS | FLAUNT YOUR TEAM'S ACHIEVEMENTS | GET COMPETITIVE | STAY MOTIVATED



GLOBAL
STEP CHALLENGER

[HOME](#) [TERMS & CONDITIONS](#) [PRIVACY POLICY](#) [CONTACT US](#) [Q](#)



These are just some of the Step Challenger's features that set it apart from the rest

YOU SET THE CHALLENGE >

Do you want your company to walk to the moon and back? Or circumnavigate Africa? With the Step Challenger, the goal is yours to set. Dream big, because the only limits are the ones that you set.

LIVE, INTERACTIVE DASHBOARDS >

Not only can you create your team, give yourselves a name, and pick your favourite avatars, but the Step Challenger's live, interactive dashboards keep you up to date with every member's total steps, latest points scored, top achievements, amount of calories burned, and much more.

EVERYONE IS A HERO >

The Step Challenger's Hall of Fame encourages colleagues to nominate their peers for any achievements they've earned or challenges they've met - whether it's cycling the 94.7 for the first time, finishing their first ever 5km run, or burning more calories than most. No matter how big or small the victories, the Step Challenger celebrates them all.

GLOBAL
STEP CHALLENGER

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The more you move, the healthier you'll be.

Tracking your steps is a great way to set exercise goals, maintain a healthy weight, and increase your fitness levels.

Step Challenger tracks:

- Daily steps.
- Stairs climbed.
- Swimming.
- Aerobics.
- Running.



TEAM BUILDING >

Compete as an individual, a team, a business unit, or a company. Live leader boards keep things competitive, while trophies, achievement badges, and an interactive hall of fame keep the motivation levels high.



HEALTHY GOALS >

Healthy, happy employees are productive employees. Setting healthy goals and achieving them will boost confidence, foster a strong corporate culture, and elevate staff morale.



PERSONALISED & CUSTOMISED >

Step Challenger is personalised to give each user a unique experience, and customised according to your company's brand and corporate wellness strategy.

Gamification – Monster Guard App

 American Red Cross

[Download Now ▶](#)





The App that Helps Kids Stay Safe

Monster Guard is the first mobile app created by the American Red Cross that's designed specifically for kids. Follow Maya, Chad, Olivia and all the monsters as they teach kids (aged 7-11) about how to prepare for real-life emergencies-at home plus other environments-in a fun and engaging game. This free app is available to download on iOS and Android mobile and tablet devices.



[Download Now ▶](#)

- ★ **Learn** how to stay safe from emergencies in your house and around the country.
- ★ **Practice** what you learned as you go through lots of fun and challenging levels.
- ★ **Share** with your friends when you pass levels and what you've learned with grown-ups.

Meet The Monsters



Olivia - The Nice Girl



Age: 15



Specialties: Emergency Supplies Kits, Tornadoes

Olivia - The Nice Girl

[Download Now ▶](#)

Gamification in Industry

Increase of one-thousand percent in employee engagement

T-Mobile Boosts Employee And Customer Engagement All At Once

By Ivan Kuo - February 3, 2015 5385 3

SHARE



Facebook



Twitter



G+



Pinterest



Like 0



Tweet



It is not every day that you hear of a huge company such as T-Mobile seeing an increase of one-thousand percent in [employee engagement](#). That is exactly what the company achieved when it set out to boost the way that employees and customers could engage with one another. It all happened in 2013 through the magic of gamification.



Employees Received Status And Prestige

How gamification is transforming Industry 4.0

EU Automation (European Automation Ltd)

[Company profile](#)

[visit website](#)

What's the best way to boost employee morale? Can we make human-machine interfaces (HMIs) more interactive? How can autonomous guided vehicles (AGVs) become easier to programme? The answer to some of the most common questions in manufacturing may not lie in typical approaches, but rather in gamification. Neil Ballinger, head of EMEA sales at automation parts supplier EU Automation, explains how playful elements could benefit Industry 4.0.

Gamification is the implementation of game mechanisms, strategies and visual elements in a non-game context, such as manufacturing. It may be surprising, but many of the problems that users encounter when interacting with industrial equipment are the same as those players must tackle in games.

For example: what's the most cost-effective way of managing resources through the different stages of production? It's a strategy game! Or, how can AGVs be faster and more efficient in moving items from point A to point B? It's a racing game!

It's all in your head

One area where the principles of gamification are being successfully applied is in the creation of highly interactive HMIs.

Traditionally, manufacturing processes centre on the machines and their requirements to optimise productivity, quality and profit. On the other hand, gamification processes centre on users and their interests. Games stimulate players' attention with a combination of attractive design and highly interactive mechanisms, and the user is constantly asked to input orders and react to environmental changes.

The principles of gamification are rooted in concepts from behavioural and motivational psychology and are proven to raise users' attention spans and alleviate cognitive fatigue. When transferred to a factory setting, this may result in higher levels of job satisfaction, improved quality of work and increased safety. Also, according to the *Industrial Psychiatry Journal*, users who are more alert are less likely to make mistakes.

For these reasons, gamification can be useful when designing HMIs for the factory floor. As with games, HMIs can offer visual and auditive feedback in response to the user's input. The system can also reward the user with a series of points after a correct action, measure them against a set daily target, or suggest the following action after a task has been successfully completed.

Gamification for enhancing student engagement and online learning communities



Gamification - Pros

- 1 Getting students to engage with online learning usually takes stronger motivation, gamification and digital tools can potential help provide this stronger motivation
- 2 It can encourage increased participation and engagement (Kapp, 2012) both in the individual and in an online community setting - social connections (Bellotti et al., 2010)
- 3 Can make tasks/learning more interactive and engaging
- 4 Can generate competitiveness which in turns produces greater engagement
- 5 Provides instant feedback
- 6 Could potentially be particularly effective with the younger generation who are digital natives

Gamification - Cons



There is mixed empirical evidence on the impact of gamification in increasing engagement and motivation. Hence there is a possibility that it will not be as effective as the hype suggests.

Some of the
theories



Why we do what we do: Intrinsic vs Extrinsic Motivation



Whether or not a student engages is strongly link to motivation and as such if gamification is able to increase motivation then it becomes a valuable asset in the learning cycle.



Intrinsic motivation – behaviour is not driven by external rewards but based on internal cues such as enjoyment, curiosity, interest. Motivation is from within.



Extrinsic motivation – behaviour is driven by external rewards such as money, grades, prizes. Motivation is external to self.

Gamification and Motivation



- It is easy to see the link between extrinsic motivation and gamification. Where achievements such as badges, points, certificates, position on the leaders board can have a direct impact.
- It is not as straight forward to see any links between intrinsic motivation and gamification. However, gamification can help further a student along the path that they have chosen. So for instance a student who is very driven will find that gamification helps with instant feedback leading to improved learning outcomes. The gamification does not initiate the motivation but enhances the existing intrinsic motivation that the student has.

Why it works – the neuroscience of gamification

- 1 Neurotransmitters are chemicals that transmit signals around the brain
- 2 They have different functions and are triggered by different things

- 3 When gamification is implemented well neurotransmitters are released
- 4 The four most cited neurotransmitters in gamification are; Dopamine, Endorphines, Oxytocin and Serotonin

Why it works – the neuroscience of gamification



Dopamine is released in response to anticipation of rewards (and as such can directly influence motivation)



Endorphines are associated with euphoria. Overcoming challenges can stimulate its release



Oxytocin is linked with social bonding. When well utilised this can be useful when developing online learning communities



Serotonin is associated with mood regulation. Moods are in turn affected by feelings of significance and importance. Again, this can be utilised in gamification

Gamification Simplified



Theoretical backgrounds for gamification

- Behavioural decision theory
- Behavioural intention and actual behaviour
- Cognitive load theory
- Elaborative likelihood model
- Flow theory
- Homo ludens
- Information processing theory
- Keller's motivational model
- Organisational learning theory
- Self-determination theory
- Social cognitive theory and social learning theory
- Experiential learning
- Input-Process-Output model
- Theory of gamified learning
- Technology enhanced training effectiveness model



The conceptual framework used for the black board implementation is based on the Input-Process-Output-Model proposed by Garriss et.al.

Input-Process-Output-Model

INPUT

PROCESS

OUTPUT

User Judgments



Instructional Content

Game Characteristics

Learning Outcomes

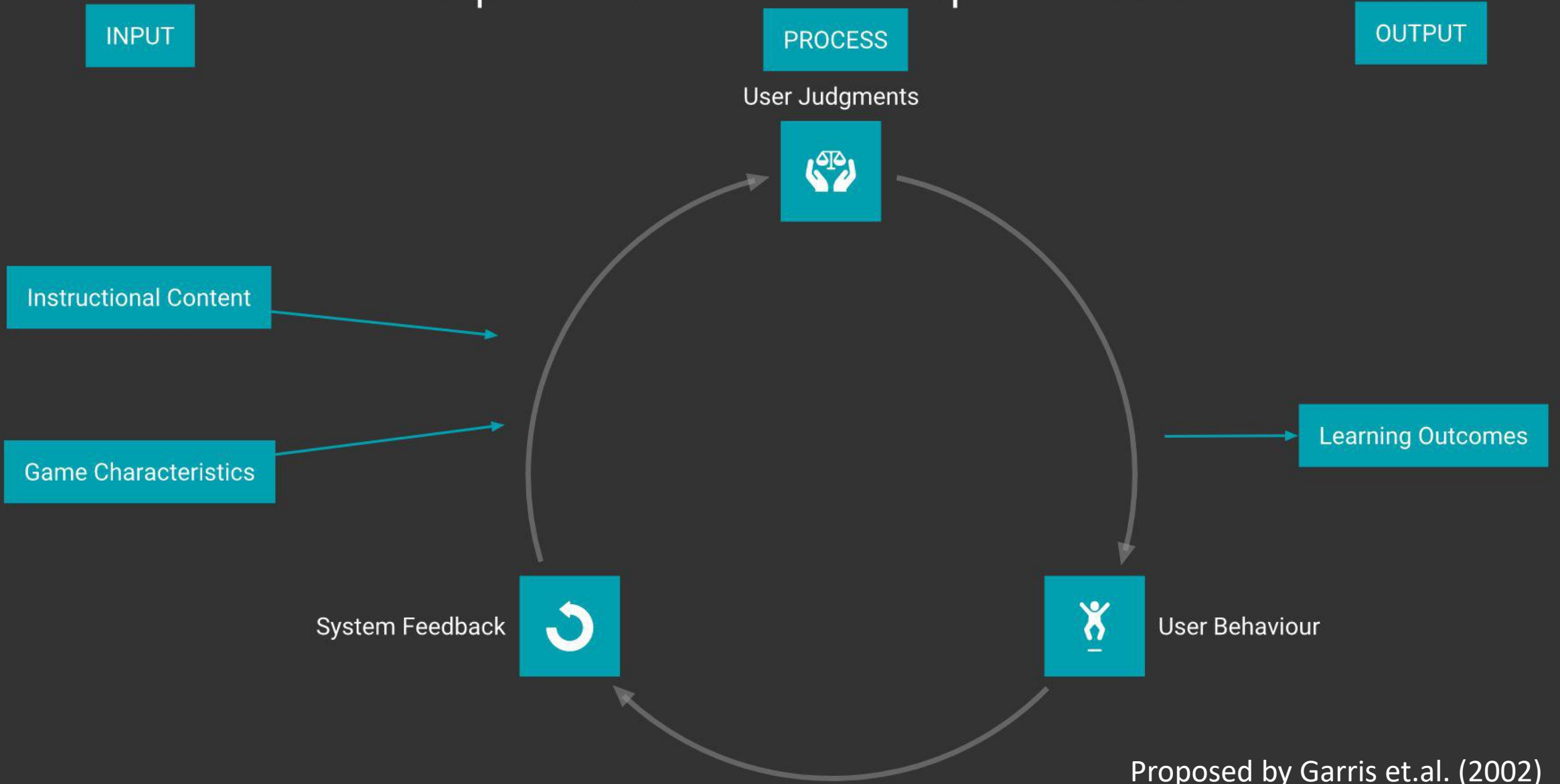
System Feedback



User Behaviour



Proposed by Garris et.al. (2002)

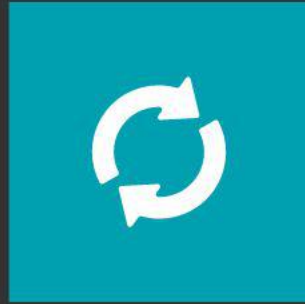


Input-Process-Output-Model

The main aim of any training intervention is a motivated learner
The Model has 3 major steps



#1 design/creation of instruction
content with game
characteristics



#1 triggers #2 which is a cycle of
learning which comprises of the
user's judgements of the
material, the user's behaviour
and the system feedback. The
idea is this continues in a loop
and eventually results in



#3 the learning outcomes

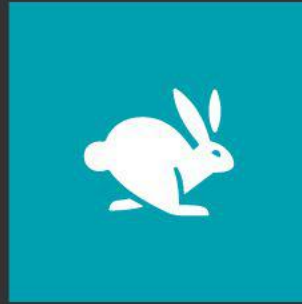
The conceptual framework that the Black Board implementation is based on is adapted from this theory
(i.e. the Input-Process-Output-Model)

Gamification Conceptual Framework

Levels of Engagement



Level 1 – passive engagement badges/points for attempts etc. For instance for opening up/watching asynchronous material e.g. video, LinkedIn link, slides but not attempting quizzes etc.



Level 2 – active engagement badges/points for graded quizzes, tests etc. This is where an individual actively engages. For instance attempting quizzes, getting feedback, re-attempting etc.



Level 3 – deep engagement certificates for hackathon, profile/discussion board participation and other online community engagement.

INPUT

PROCESS

OUTPUT

Types of Learners

User Judgments

Instructional Content

Game Characteristics

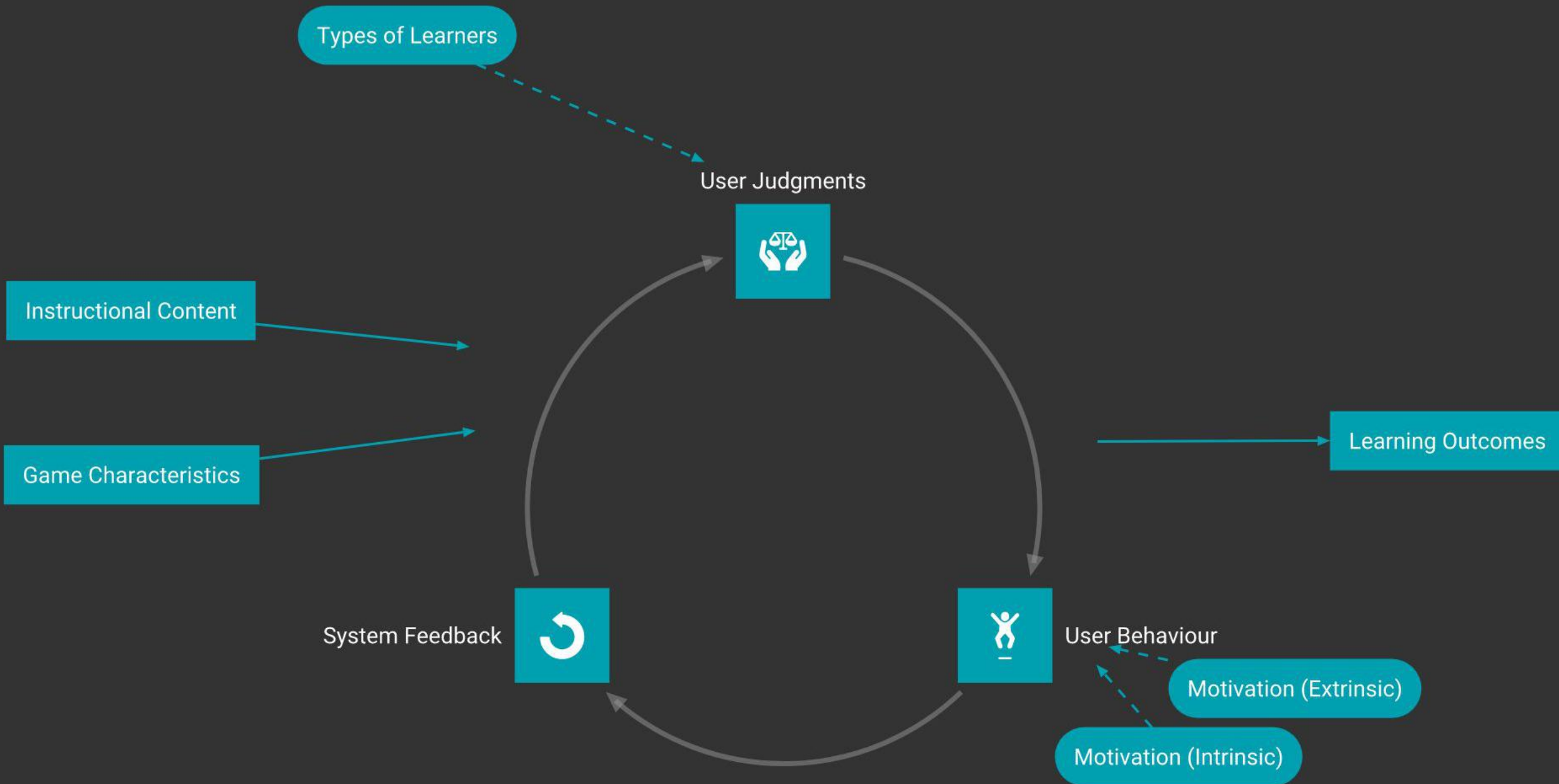
Learning Outcomes

System Feedback

User Behaviour

Motivation (Extrinsic)

Motivation (Intrinsic)



INPUT

PROCESS

OUTPUT

Engagement Levels

Types of Learners (TL)

User Judgments

Engagement Level = $\text{fn}(\text{IC}, \text{GE}, \text{TL}, \text{Me}, \text{Mi})$

Instructional Content (IC)

Gamification Elements (GE)

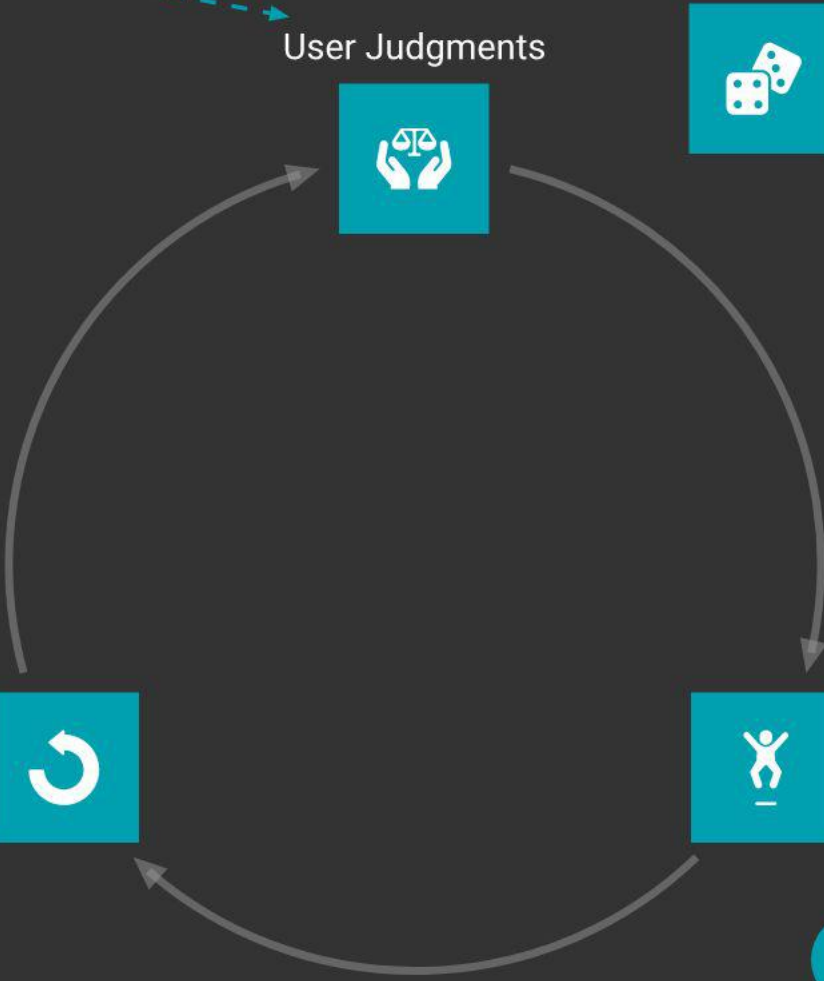
Learning Outcomes

System Feedback

User Behaviour

Motivation (Extrinsic) - Me

Motivation (Intrinsic) - Mi



Using the Conceptual Framework to Enhance Engagement

1 Engagement Level =
 $\text{fn}(\text{IC}, \text{GE}, \text{TL}, \text{Me}, \text{Mi})$

2 To increase engagement (both individual and in terms of online communities, need to focus on IC,GE -> TL,Me,Mi

3 The ones we have control over are IC and GE (both of which should be developed with TL in mind). This in turn raises Me and perhaps to a limited extent Mi.

INPUT

PROCESS

OUTPUT

Engagement Levels

Types of Learners (TL)

User Judgments



$$\text{Engagement Level} = \text{fn}(\text{IC}, \text{GE}, \text{TL}, \text{Me}, \text{Mi})$$

Instructional Content (IC)

Gamification Elements (GE)

Learning Outcomes

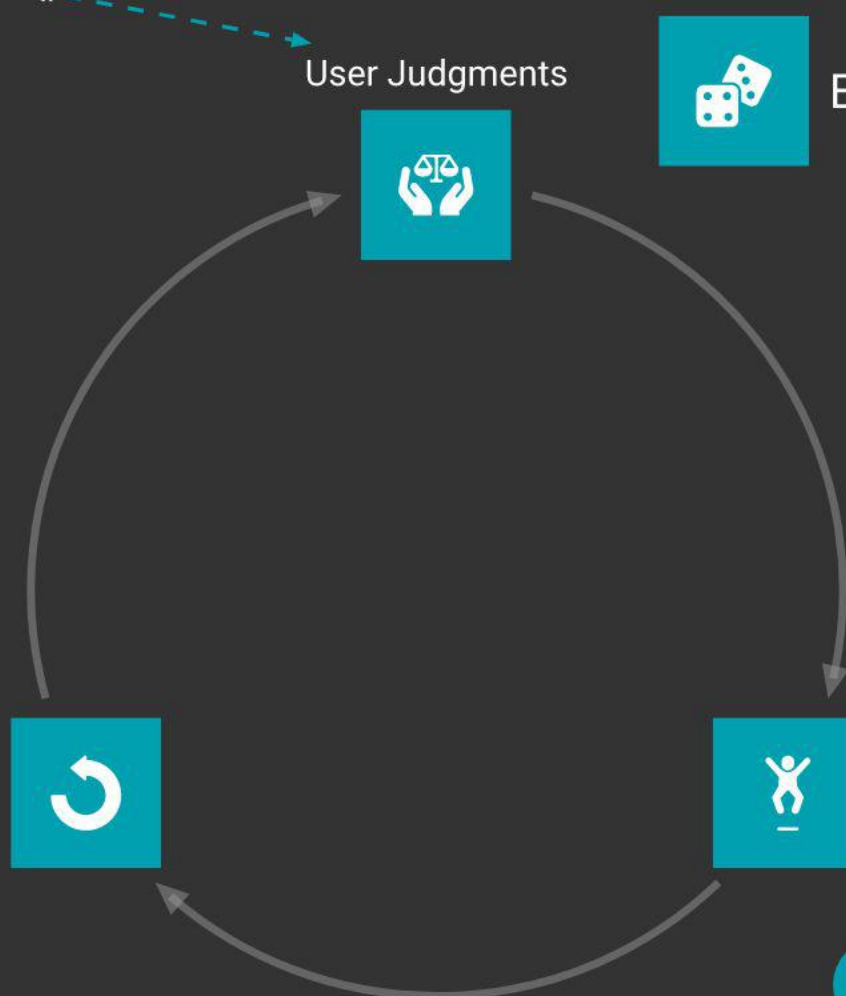
System Feedback

User Behaviour

Motivation (Extrinsic) - Me

Motivation (Intrinsic) - Mi

gamification

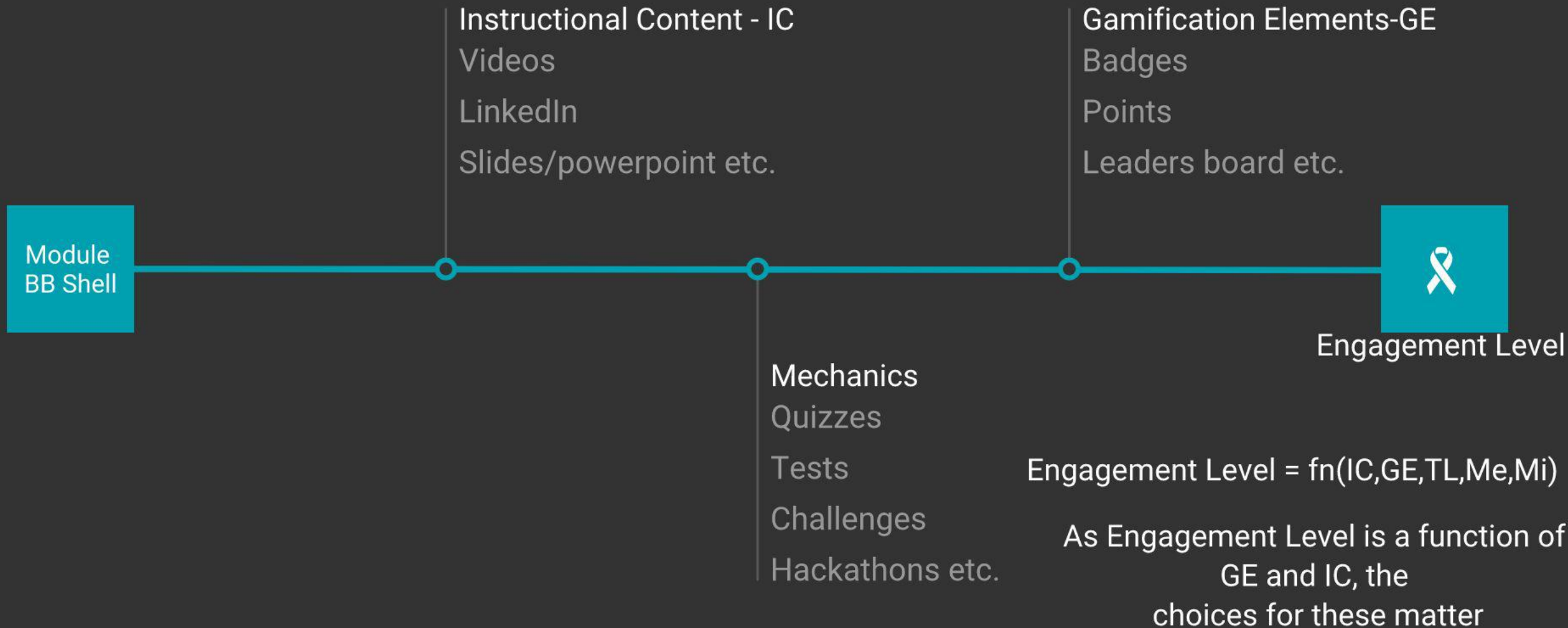


x

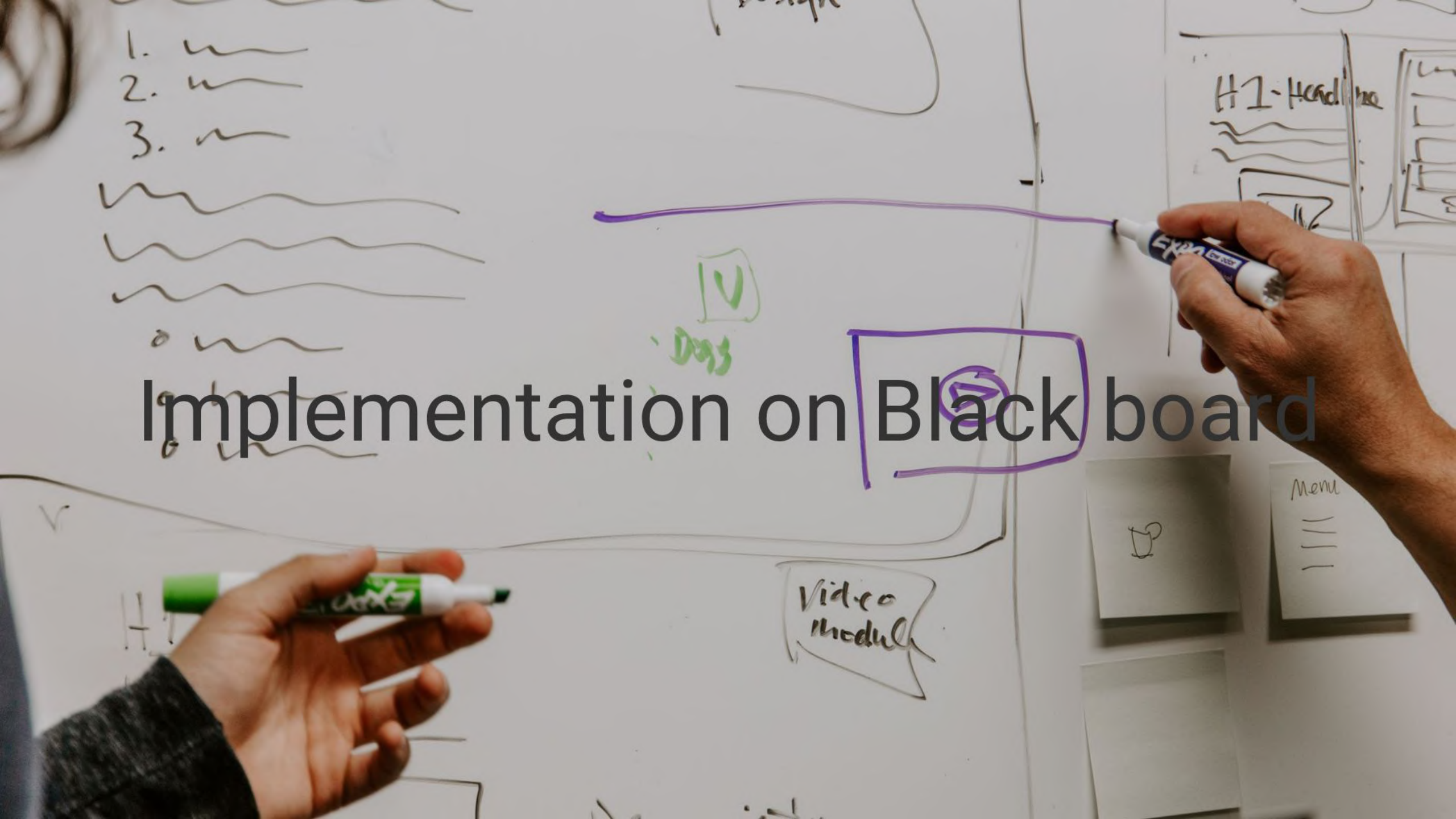
y

z

Module Learning Environment



Implementation on Black board





Implementation - Enhancing Individual Engagement

Mechanics

Quizzes

Tests

Challenges etc.

Gamification Elements

Badges

Points

Certificates etc.



Implementation - Developing Online Communities

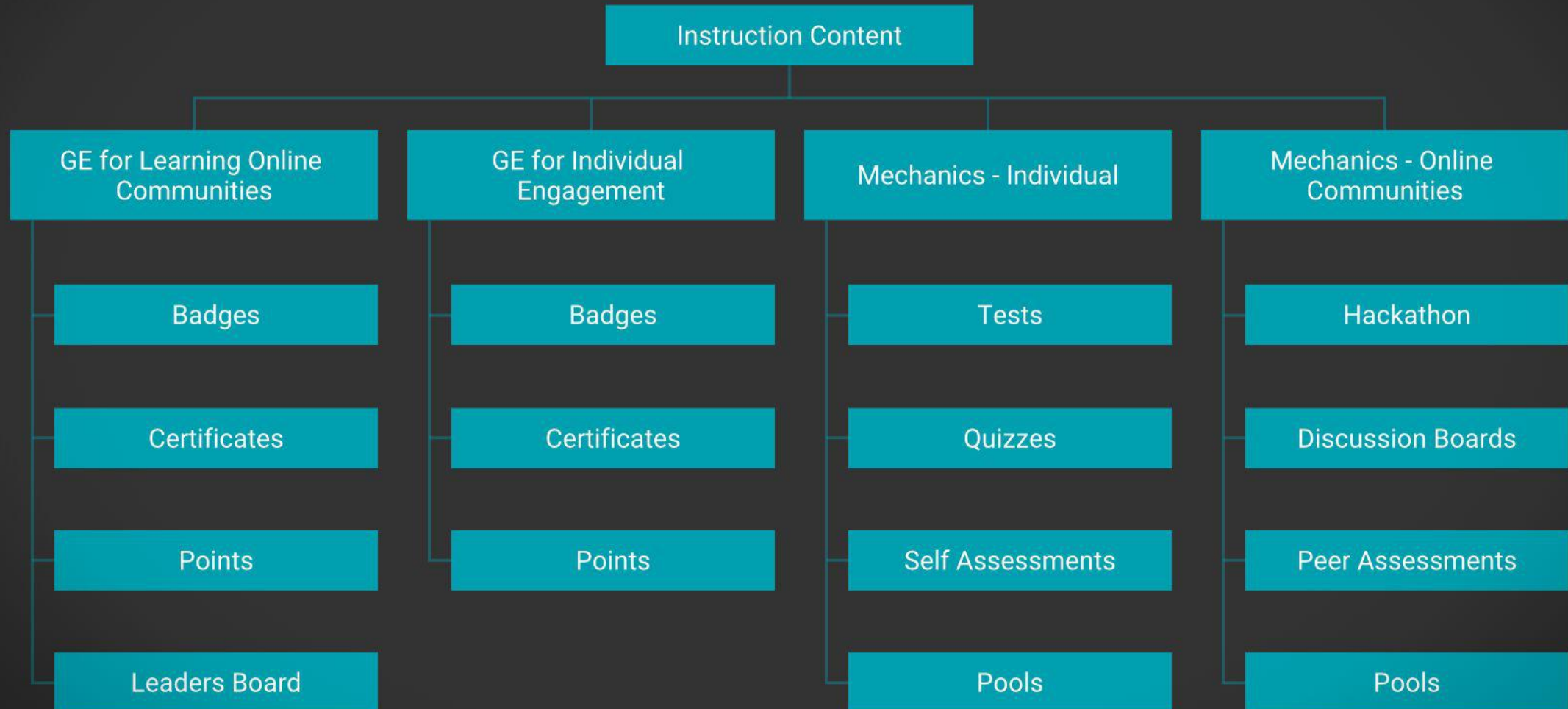
Mechanics

Hackathons
Discussion boards
Team Challenges
Personal Intros etc.

Gamification Elements

Points
Certificates
Badges
Leaders board etc.

Gamification Strategy



Instruction Content - CELT Resources

- CELT link for <https://celt.our.dmu.ac.uk/remote-teaching-2/>
 - Setup and use Discussion Board on Blackboard
 - Setup and use a Wiki in Blackboard
 - Videos on setting up tests/surveys/pools
<https://celt.our.dmu.ac.uk/blackboard/blackboard-how-do-i/blackboard-course-management/blackboard-assessment-tools/>
 - Setup self/peer assessment tests
<https://celt.our.dmu.ac.uk/blackboard/blackboard-how-do-i/blackboard-course-management/blackboard-assessment-tools/create-a-self-or-peer-assessment/>

Instructional Content LinkedIn

To end of url add
&auth=true

+

Add Menu Item (Click to see options)

- Content Area
- Module Page
- Blank Page
- Tool Link
- Web Link**
- Course Link
- Subheader
- Divider

Tools 

Turnitin 

← → ↺ ↻ ↵

linkedin.com/learning/learning-data-analytics-2/welcome?u=68130314

Apps Dictionaries, Part 1 |... M The Best Public Dat... 2 samuel 3 NIV - Th... O'Reilly Learning Pl... DataCamp How do I read JSO... Making modificatio... Guidance and form... RUSI partners with... Telematics and Info... How to Add

in LEARNING Browse

Search for skills, subjects or software

Home My Learning Me EN

Contents

Learning Data Analytics
Welcome

Introduction

- Welcome 47s
- What you should know 11s
- How to use the exercise files 23s

1. Getting Started with Data Analysis

- Defining data analysis and data analyst 1m 39s
- Discovering if you are an analyst 1m 59s
- Understanding roles in data analysis 1m 16s
- Discovering skills of the data analyst 1m 51s
- Chapter Quiz 2 questions

2 Fundamentals of Data Understanding

Learning Data Analytics

with Robin Hunt

0:01 / 0:47

Overview Q&A Notebook Transcript

Instructional Content LinkedIn

Add Web Link

* Name:

* URL:

*For example,
http://www.myuniversity.ac.uk*

☐ Available to Users

- IMAT5322_2021_502 Big Data Analytics
- Learning Materials
- Announcements
- Staff Contacts
- Content
- Module Information
- Resource List
- Tools
- Turnitin
- LinkedIn Learning

LinkedIn Learning interface showing the 'Learning Data Analytics' course. The left sidebar lists the course contents, including 'Introduction', 'Welcome', 'What you should know', 'How to use the exercise files', '1. Getting Started with Data Analysis', 'Defining data analysis and data analyst', 'Discovering if you are an analyst', 'Understanding roles in data analysis', 'Discovering skills of the data analyst', and 'Chapter Quiz'. The main content area displays a large illustration of a man and a woman interacting with a large pie chart and bar chart, symbolizing data analysis. The bottom navigation bar includes 'Overview', 'Q&A', 'Notebook', and 'Transcript'.

LinkedIn

Distance teaching support from CELT

Access to LinkedIn Learning:

A role of academic LinkedIn Learning sub-administrators has been set-up so that colleagues can create links for their students that avoid the single sign-on. For example, this will make it easy for your students to access LinkedIn Learning materials from your DMU Resources list. Sub-admins can also view usage reports showing student engagement and LinkedIn Learning course completions.

https://dmu-ac-uk.libwizard.com/f/LinkedIn_permissions

Mechanics – Creating Tests/Surveys/Pools

Course Management

- Control Panel
- Files
- Course Tools
 - Achievements
 - Announcements
 - Attendance
 - Blackboard Collaborate Ultra
 - Blogs
 - Contacts
 - Course Calendar
 - Course Messages
 - Discussion Board
 - Glossary
 - Journals
 - Manage Campus Pack
 - Mobile Compatible Test List
 - Rubrics
 - Self and Peer Assessment
 - Send Email
 - Tasks
 - Tests, Surveys and Pools**
 - Turnitin Assignments
 - Turnitin Assignments by Groups
 - Wikis
- Evaluation
- Grade Centre
- Users and Groups

Tests, Surveys and Pools

Tests

Surveys

Pools

Test Canvas: Apache Spark

Create Question Reuse Question Upload Questions

Calculated Formula

Calculated Numeric

Either/Or

Essay

File Response

Fill in Multiple Blanks

Fill in the Blank

Hot Spot

Jumbled Sentence

Matching

Multiple Answer

Multiple Choice

Opinion Scale/Likert

Ordering

Quiz Bowl

Short Answer

True / False

Type: - Question Type -

Update Hide Question Details

Apache Spark: RDDs are building blocks for which ob...

RDDs are building blocks for which objects?

- a. Data frames
- b. Graph frames
- c. Apache SQL
- d. Spark Streaming

Correct Feedback Well done!

Incorrect Feedback Incorrect answer - retry test

Mechanics – Creating Tests/Surveys/Pools

Course Management

- ▼ **Control Panel**
- Files
- ▼ **Course Tools**
 - Achievements
 - Announcements
 - Attendance
 - Blackboard Collaborate Ultra
 - Blogs
 - Contacts
 - Course Calendar
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 - Tests, Surveys and Pools**
 - Turnitin Assignments
 - Turnitin Assignments by Groups
 - Wikis
- Evaluation
- Grade Centre
- Users and Groups

Tests, Surveys and Pools

- Tests
- Surveys
- Pools

Survey Canvas: Preliminary Survey

Create Question ▼ Find Questions Upload Questions

Description

Instructions

Total Questions 1

Select: | Select by Type: - Question Type - ▼

→

☐ 1. True / False: Prior programming experience: Have you any programming experience? ▼

Question	Have you any programming experience?
Answer	True
	False

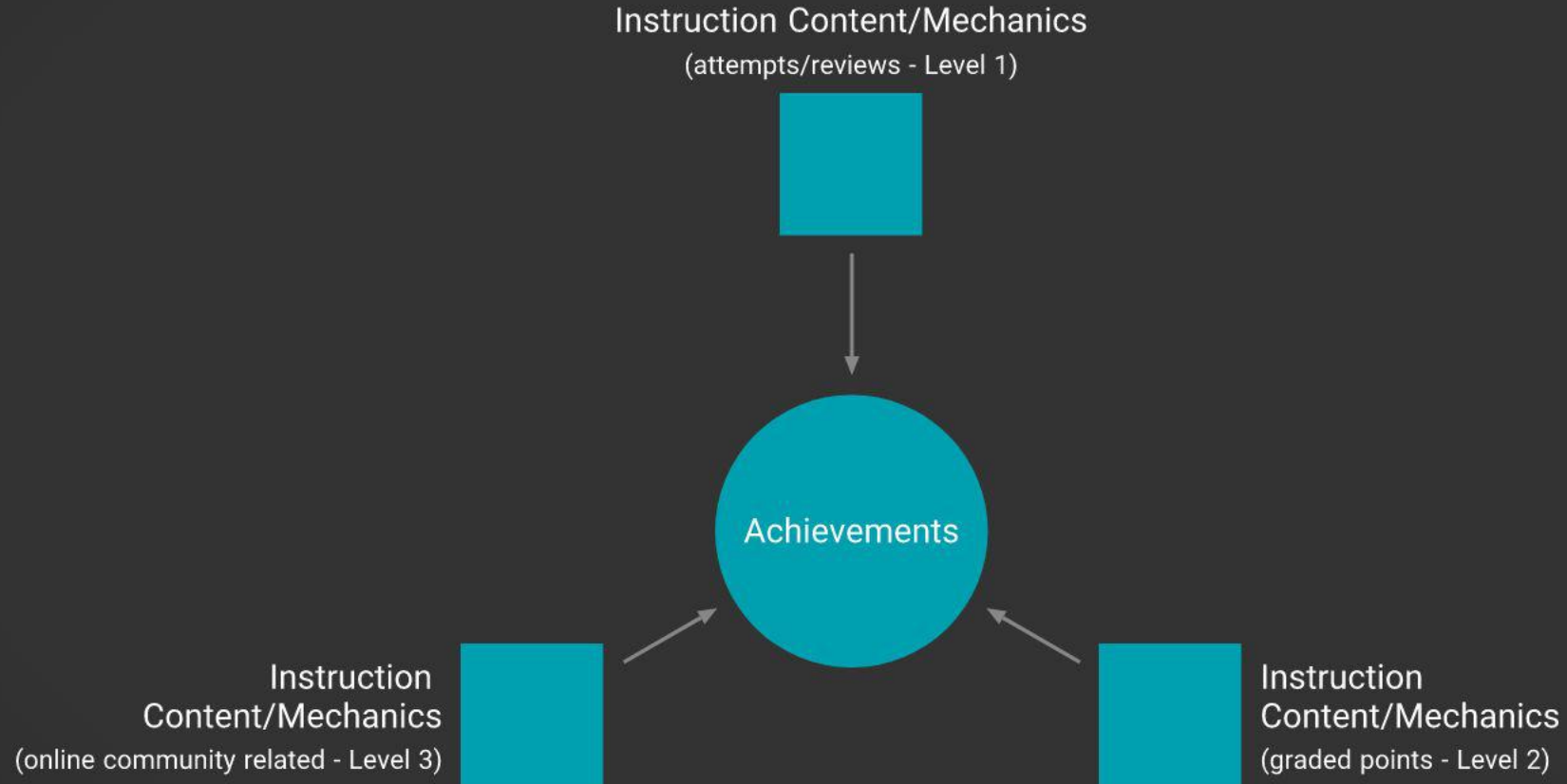
Select: | Select by Type: - Question Type - ▼

→

Blackboard Achievements

- Attempts on test, surveys, and assignments
- Grades on tests, surveys, and assignments
- Graded discussion posts, graded wikis, graded blogs, and graded journals
- Manually created Grade Center columns
- Marked reviewed statuses on course content
- Group membership or specific users
- Start date to earn an achievement

Link the Instruction Content and Mechanics to Achievements



How to Create Achievements (Milestone)

Course Management

- Control Panel
- Files
- Course Tools**
 - Achievements**
 - Announcements
 - Attendance
 - Blackboard Collaborate Ultra
 - Blogs
 - Contacts
 - Course Calendar
 - Course Messages
 - Discussion Board
 - Glossary
 - Journals
 - Manage Campus Pack
 - Mobile Compatible Test List
 - Rubrics
 - Self and Peer Assessment
 - Send Email
 - Tasks
 - Tests, Surveys and Pools
 - Turnitin Assignments
 - Turnitin Assignments by Groups
 - Wikis
- Evaluation
- Grade Centre
- Users and Groups
- Customisation

Achievements

Create Achievement ▾

- Course Completion
- Milestone
- Custom

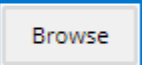
Create Achievement

Test-Achievement  

About Define Triggers Select Reward

* Indicates a required field.

ACHIEVEMENT INFORMATION

 * Achievement Location 

Achievement Type

Visible to students before receiving ☒ Yes ☐ No

Description



Create Achievements (Milestone)

Define Triggers

Create Achievement

Test-Achievement



About ☒ **Define Triggers** Select Reward

Saved Rules (0) Add Another Rule

* Indicates a required field.

RULE NAME

* Rule Name

Rule 1

DATE

Display After

☐

10/09/2020



01:38



MEMBERSHIP

Username

Browse

Course Groups

No items found.

MARK

Select a Grade Centre column

None



Select Condition

☐ User has at least one attempt for this item

☐ Score ☐ Percent Less than or equal to



☐ Score ☐ Percent Between and

Add Item

REVIEW STATUS

Select an item

Cancel

Next

Select Reward



Create Achievements (Milestone)

Select Reward

About ✓

Define Triggers ✓

Select Reward

* Indicates a required field.

REWARD DETAILS

* Issuer Name



Expiration Date

☐ 10/09/2020 

☐ Valid for Day(s)

Certificates are not an option for milestone achievements (see next slide for custom one)

REWARD OPTIONS

* Badge Image

Select image from badge catalogue



Attach File

Publish to Mozilla

☐ On ☒ Off

Create Achievements (Custom)

Select Reward

REWARD DETAILS

* Issuer Name



Expiration Date

☐ 10/09/2020 

☐ Valid for Day(s) 

REWARD OPTIONS

Certificate

Select image from certificate catalogue



Preview Certificate

Badge Image

Select image from badge catalogue



Attach File

Browse My Computer

Create Achievements (Custom)

Preview Certificate

REWARD OPTIONS

Certificate

Select image from certificate catalogue



Preview Certificate



This is to certify that

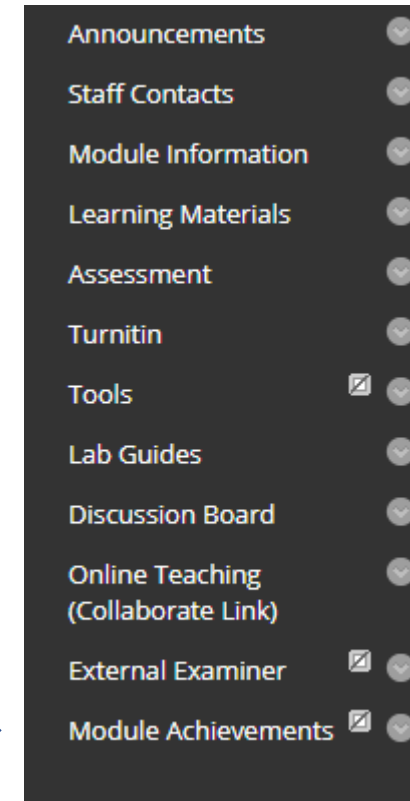
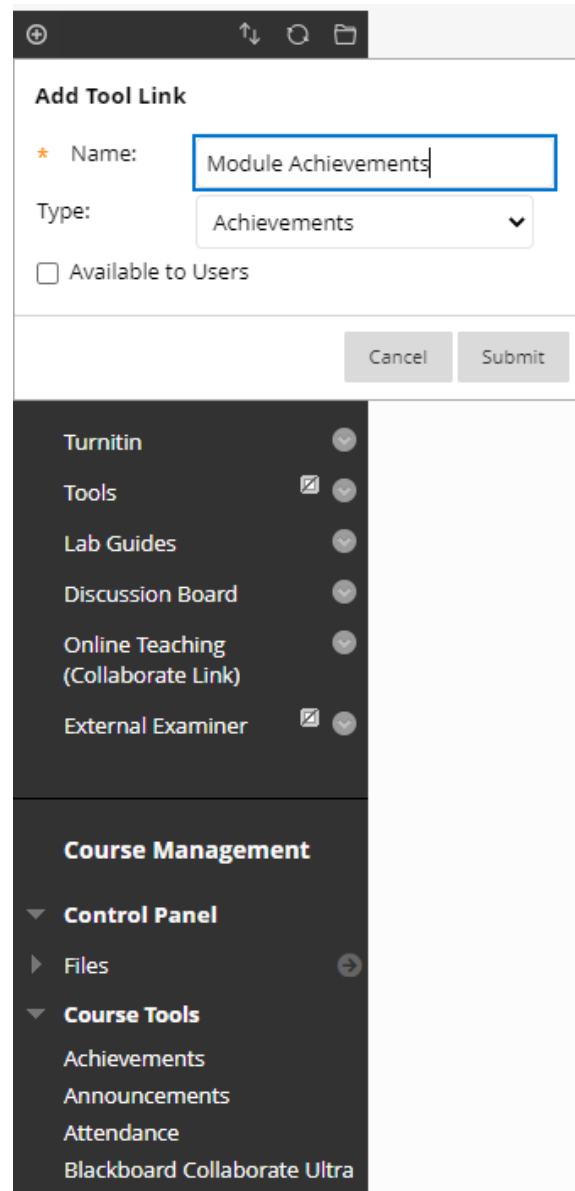
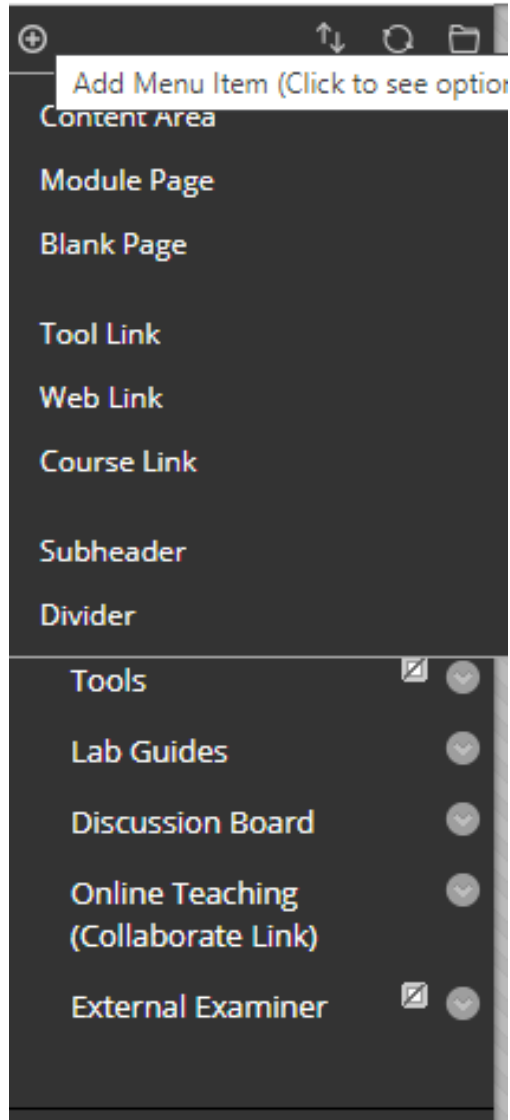
Funmi Obembe

has successfully completed

on

10 September 2020

Creating a Link to Course Achievements



Students Achievement View

My Achievements



Funmi Obembe

You have 0 new achievement(s)

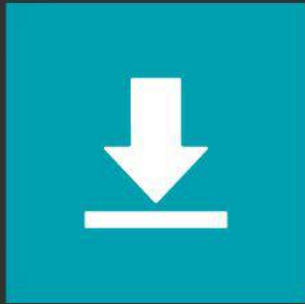
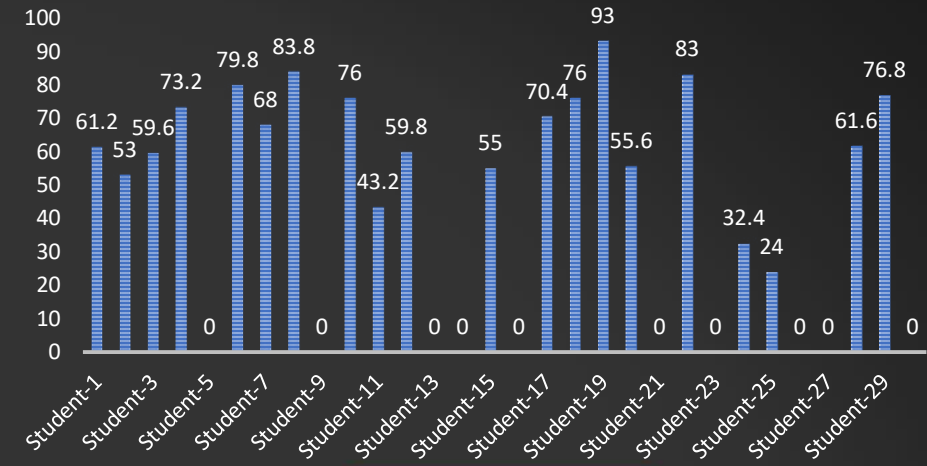
All Achievements

Earned Achievements

Unearned Achievements

Leaders Board

LEADERS BOARD - IMAT



Download from grade centre



ETL loads into database where mapping table is used to map student names to pseudo names



Leader board is refreshed with new scores

Other useful digital tools

1 Microsoft forms

2 iSpring Quiz Maker

3 iSpring Talk Master

4 Raptivity

5 Articulate

6 Elucidat

References

- Alsawaier, R. (2017). The Effect of Gamification on Motivation and Engagement. *International Journal of Information and Learning Technology*. 35. 00-00. 10.1108/IJILT-02-2017-0009.
- Anderson, A., Huttenlocher, D., Kleinberg, J., and Leskovec, J. (2013). Steering user behavior with badges. In *Proceedings of the 22nd international conference on World Wide Web (WWW '13)*. Association for Computing Machinery, New York, NY, USA, 95–106. DOI:<https://doi.org/10.1145/2488388.2488398>
- Burke, B. (2014). Gartner Redefines Gamification http://blogs.gartner.com/brian_burke/2014/04/04/gartner-redefines-gamification/
- Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011). From game design elements to gamefulness: defining gamification. In *15th International Academic MindTrek Conference: Envisioning Future Media Environments* (pp 9–15). New York, NY:ACM
- Dichev, C., Dicheva, D. (2017). Gamifying education: what is known, what is believed and what remains uncertain: a critical review. *Int J Educ Technol High Educ* 14, 9 <https://doi.org/10.1186/s41239-017-0042-5>
- Garris, R., Ahlers, R., & Driskell, J.E. (2002). Games, motivation, and learning: A research and practice model. *Simulation & gaming*, 33(4), 441-467.
- Kapp, K. (2012) *The gamification of learning and instruction: game-based methods and strategies for training and education*
- Kolb, D.A. (1984). *Experiential Learning: Experience as the Source of Learning and Development*. Englewood Cliffs, New Jersey: Prentice-Hall.
- Kraiger, K. (2003). Perspectives on training and development. *Handbook of psychology*, 171-192.
- Putz, L., & Treiblmaier, H. (2015). Creating a Theory-Based Research Agenda for Gamification. *AMCIS*.
- Sailer, M., Hense, J., Mayr, S., and Mandl, H. (2017). How gamification motivates: An experimental study of the effects of specific game design elements on psychological need satisfaction. *Computers in Human Behavior*. 69. 371-380. 10.1016/j.chb.2016.12.033.
- <https://www.gamified.uk/2015/01/05/neurotransmitters-you-should-know-about-in-gamification/>
- <https://octalysisgroup.com/the-neuro-science-behind-octalysis-gamification/>
- <https://playmotiv.com/en/gamification-and-dopamine-why-games-motivate-us/>
- <http://www.globalstepchallenger.net/>
- <https://www.redcross.org/monster-guard.html>
- <https://www.gamification.co/2015/02/03/t-mobile-boosts-employee-customer-engagement/>



Any final thoughts?

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