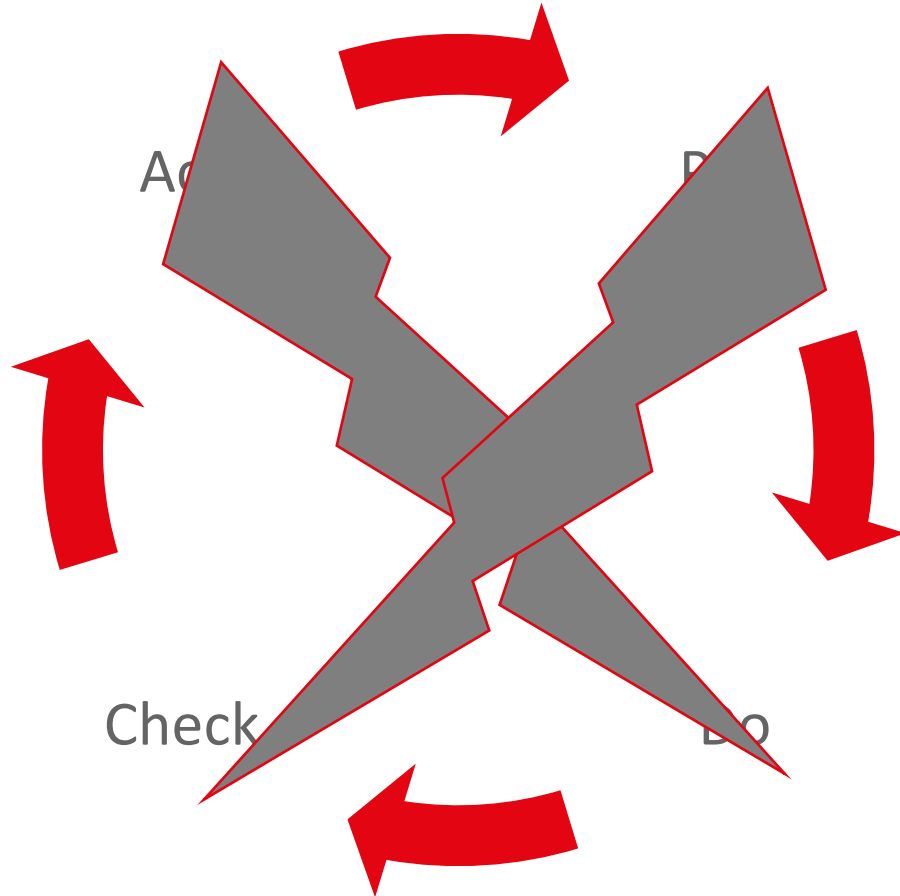


POTENTIAL OF GAMIFICATION FOR LEAN CONSTRUCTION TRAINING: AN EXPLORATIVE STUDY

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Manfred Helmus**

Lean Construction = Continuous Improvement



Continuous Improvement

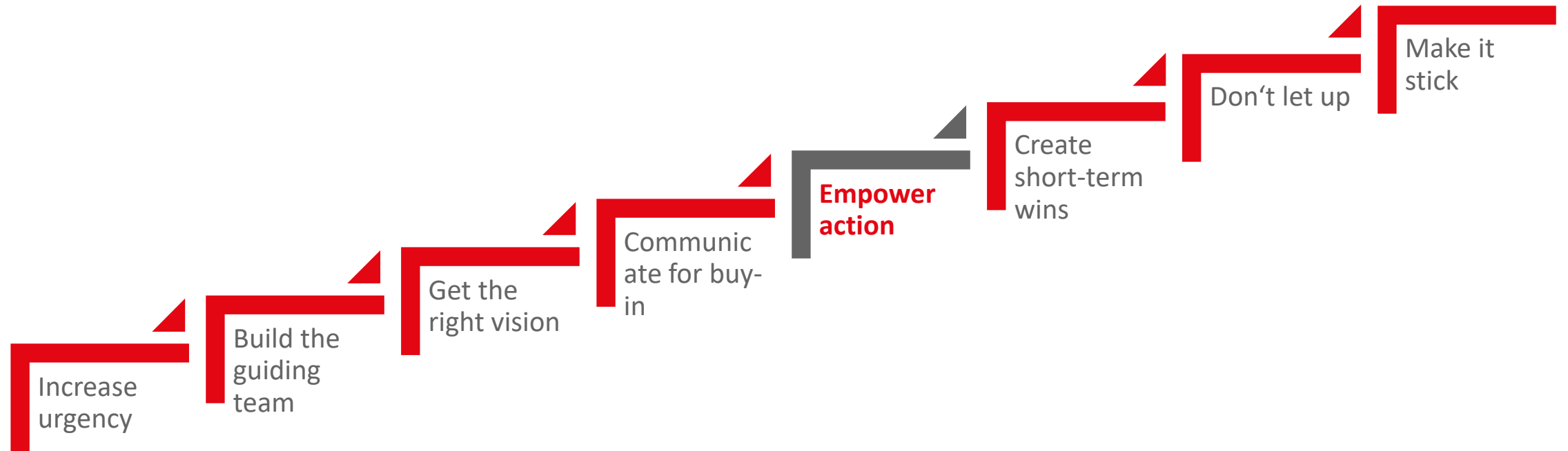
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Continuous Change

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Common failure rates between 50 – 70 %
(Schaffer and Harvey, 1992, Balogun and Hailey; By 2005)

ONE WAY TO CONDUCT CHANGE STRATEGICALLY



CONCEPT TO TEACH AND TO EMPOWER EMPLOYEES TO SUPPORT CHANGE PROCESSES

GAMIFICATION

=

Concept to develop enthusiasm, motivation and commitment through elements from games (McGonigal 2012)



WHAT IS GAMIFICATION

GAMIFICATION
=
USING GAME DESIGN ELEMENTS IN NON-GAME CONTEXTS

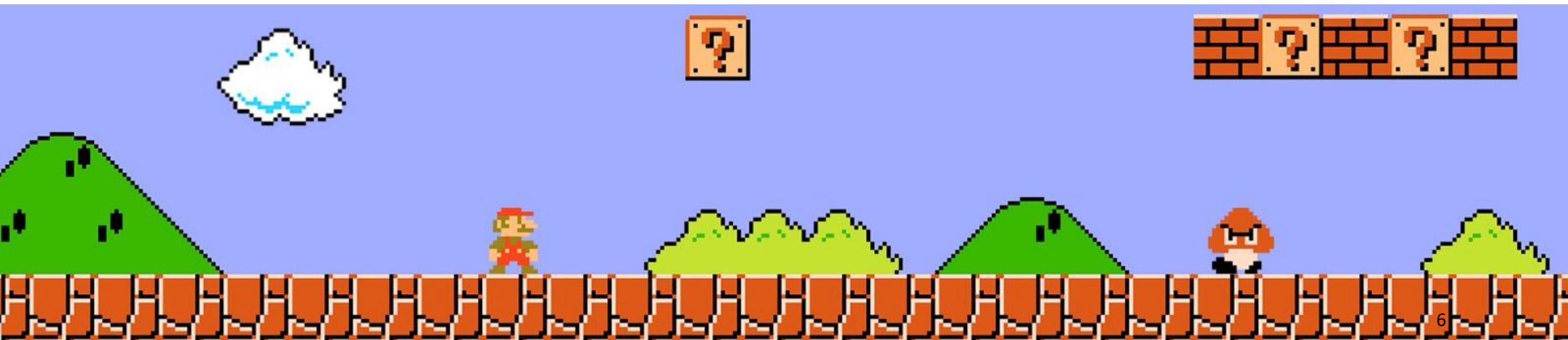


WHAT IS GAMIFICATION

GAMIFICATION

≠

SERIOUS GAMES



EXAMPLES FOR GAMIFICATION ELEMENTS

Game design element	Definition	Recommendation
Badges	Visual icons signifying achievements	Badges can visualize the success in certain areas, e.g. in time completion, in budget completion, good teamwork
Challenge	Element to make users feel like they earned their achievement, e.g. testing knowledge	Fulfilling the task (e.g. building a house with game bricks) within the assigned time range, budget and quality
Competition	Chance for users to prove themselves against others	Teams compete against each other in terms of time to complete task, number of mistakes, budget and quality

Table 1. Examples for gamification elements

LITERATURE REVIEW: LIST OF GAMIFICATION ELEMENTS

Avatars	1,2,5	Performance graph	1,2
Badges	1,2,3,4,5,6	Levels	2,3,4,5,6,7
Chance	2,4,6	Narrative	1,2,3,4,5,7
Challenge	2,3,4,5,6	Rewards	2,3,6
Collecting	2,3,5,6	Roles	
Competition	2,3,4,5,7	Scarcity	2,6
Content unlocking	2,3,6	Status	3,5,7
Cooperation	2,4,5,6,7	Teams	2,3,6,7
Feedback loops	2,3,4,6,7	Time pressure	3,5,7
Gifting	2,3,4,6	Virtual goods	2,4,5
Leader-boards	1,2,3,4,6	Win states	2,5
Points	1,2,3,6		

...SOME OF THOSE GAMIFICATION ELEMENTS SEEM TO BE FAMILIAR FROM LEAN CONSTRUCTION TRAININGS!

Our observations:

Lean Construction Approach	Number of investigated trainings
Last-Planner® System	3
Takt planning and takt control	3
5S	1
A3	1



Figure 1. impression of the observations

OBSERVATIONS

Similar pattern:

- 1st round: Participants receive information about different roles within the project teams. Information on the task and desired goals, such as a maximum assembly time, desired quality or a budget is given.
 - High pressure on the participants
 - The Participants fail with their tasks
 - review of the processes and issues, ranking of performance and the level of cooperation

OBSERVATIONS

Similar pattern:

- 2nd round: Participants apply the tough Lean Construction approach.
 - They can usually fulfill the game objectives
 - review of the processes and issues, ranking of performance and the level of cooperation
 - Discussion about ways of implementing the Lean Construction approaches on sites

OBSERVATIONS

Effects:

- The participants learn theoretically the Lean Construction approaches
- The participants are motivated to apply the approaches on their projects through the direct comparison of failing in the 1st round without applying the approaches and the 2nd round with applying the Lean Construction approaches

APPLIED GAMIFICATION ELEMENTS IN LC TRAININGS

Avatars 1,2,5
 Badges 1,2,3,4,5,6
 Chance 2,4,6
 Challenge 2,3,4,5,6 ✓
 Collecting 2,3,5,6
 Competition 2,3,4,5,7
 Content unlocking 2,3,6
 Cooperation 2,4,5,6,7 ✓
 Feedback loops 2,3,4,6,7 ✓
 Gifting 2,3,4,6
 Leader-boards 1,2,3,4,6
 Points 1,2,3,6 ✓

Performance graph 1,2 ✓
 Levels 2,3,4,5,6,7
 Narrative 1,2,3,4,5,7 (✓)
 Rewards 2,3,6
 Roles ✓
 Scarcity 2,6
 Status 3,5,7
 Teams 2,3,6,7 ✓
 Time pressure 3,5,7
 Virtual goods 2,4,5
 Win states 2,5

CONCLUSIONS

- Some Gamification elements are already applied in Lean Construction trainings but not all
- There is potential to improve Lean Construction trainings through adding additional Gamification elements
- We hope that our paper helps Lean Construction experts to apply more Gamification elements to improve their trainings to use Gamification's full potentials



THANK YOU!
Feedback is much
welcome!

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