Evaluating the impacts of using gamification in recommender system

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Outline

• Introduction
  • Open learner model
  • Mastery grid (recommender system used inside it)
  • which problem motivate us?
• Gamification
  • Point system
  • Achievement badges
• Dataset
• Results
• Future work
Introduction

Open Learner Model (OLM)

• Allow student to observe their knowledge

Mastery Grid
Mastery Grid
**Introduction**

- **Open Learner Model (OLM)**: Allow student to observe their knowledge
- **Mastery Grid**: ITS that use open learner model to teach java programming
- **Recommender System**: Recommend the best next activity to user
- **Motivation**:
Motivation

• Lack of usage of system
• Need to collect more data to evaluate this
• One solution is to collect data over long-term or several classroom simultaneously
• The other plan is to make the system more engaging to attract student to use system
• Gamification can be helpful!
Introduction

- Open Learner Model (OLM) • Allow student to observe their knowledge
- Mastery Grid • ITS that use open learner model to teach java programming
- Recommender System • Recommend the best next activity to user
- Motivation • Gamification Can be a useful !!!!
Gamification

- Using game-based elements in non-game context
- Increase regularly usage of system
- Leverage knowledge and skills concurrent with hooking by fun
Psychology behavior behind Gamification …. 

• Your body releases dopamine when you experience pleasure. This pleasure includes all kinds of things, including rewards.

• The more goals you achieve, the more dopamine it releases, and the easier it is to stay motivated.
Gamification

• Although using gamification seems to have potential to motivate and encourage learners, it is not trivial to get desired effects and it will need a tremendous effort on establishing such a system. So, we need to create a framework with enough quality to attract learners. (Dominguez et al., 2013)

• gamification seems to work best in helping with short term and smaller goals.

• If you aren't motivated, gamification won't get you in shape or lose weight, make you more productive, or make you a better person. However, it can add to an existing foundation that could help you get there, if you want it to.

• Each learner responds to these Badges based on their intention named as Goal Orientation and they categorized them into five group: Mastery-intrinsic, Mastery-extrinsic, Performance-approach, Performance-avoidance, and Avoidance (Auvinen, Hakulinen, and Malmi, 2015)
Implemented system

- Point System
- Achievement Badges
Dataset

- **System with Gamification**
- **Baseline Systems**
  - With Recommendation
  - No Gamification
- No Recommendation
- No Gamification

<table>
<thead>
<tr>
<th>System Type</th>
<th>Dataset Code</th>
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<tbody>
<tr>
<td>System with Gamification</td>
<td>INFSCI17Spring2018</td>
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<tr>
<td>Baseline Systems</td>
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<tr>
<td>With Recommendation</td>
<td>CIS220Spring2018</td>
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<td>No Gamification</td>
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<td>No Recommendation</td>
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### Brief overview of results

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<th>CIS220Spring2018</th>
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<tbody>
<tr>
<td><strong>Number of sessions</strong></td>
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<tr>
<td><strong>Median of number of activities in session</strong></td>
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<td><strong>Median of time spent in a session (second)</strong></td>
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<td>694</td>
<td>917</td>
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<td><strong>Median of assessment activities done (challenges, coding exercises) in a session</strong></td>
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<td>7.8</td>
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<td><strong>Median of example lines clicked in a session</strong></td>
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<td><strong>Topics covered</strong></td>
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<td>5.85</td>
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<td><strong>Total time they spend in Mastery grid</strong></td>
<td>4741</td>
<td>2124</td>
<td>4185</td>
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</table>
### Brief overview of results

<table>
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<tr>
<th></th>
<th>INFSCI17Spring2018</th>
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Future works

• Look into our data accurately and analyze them
• Combine our results we pre and post assessment of knowledge
• Do pre and post surveys which help to analyze the psychology aspect of gamification (which behavior our participants show)
• Add leaderboard as the other gamification feature
• We may use eye-tracking to see how much participant notice Badges
Thank you!

Happy to receive feedback!
easy games

- quick effect, engaging to many
- quick to master, quick to get bored
- scalable, but not sustainable

challenging games

- slow effect, engaging to few
- slow to master, slow to get bored
- sustainable, but not scalable