

## Integrating Motivational Techniques into Learning Management Systems

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#### Motivation



- Motivation is the reason that someone engages in a certain behaviour
- Motivation is a key factor in education
- Lot of research has been done by educational psychological researchers on motivational aspects in the educational domain
- These researches resulted in several theories and models
- Based on such theories and models, learning systems have been developed that use particular motivational techniques
- However, most systems include only one or few such techniques and typically they assume that the technique(s) are motivational for all learners alike

#### Motivation



- However, learners are motivated differently and what is motivational for one learner can be demotivational for another learner
- We aim at providing personalization based on motivational aspects
- The first step in doing so is to develop a framework of motivational techniques that can be used in learning systems

#### **Previous Work**



- Building a framework of motivational techniques that can be easily integrated into different learning systems
- The framework should
  - Include many diverse motivational techniques in order to motivate different learners
  - Include motivational techniques that are domainindependent and course-independent in order to make it easy to integrate them into existing systems and courses

# Framework for Incorporating Motivational Techniques



- Selected 11 motivational techniques
- Techniques are not new
- Techniques are based on motivational theories and models and most of them have already been successfully implemented in learning systems
- Techniques have been selected based on literature review and with respect to their capabilities to motivate learners
- Technique has to be domain-independent and course-independent
- Looked into the relationships of these techniques

#### Research Aim



- Design, implement and verify four motivational techniques:
  - Progress timeline
  - Progress annotations
  - Rankings
  - Awards
- Implement a tracking mechanism to log how the motivational techniques are used
- Motivational techniques were designed system independent and then implemented as block for Moodle

## Progress Timeline



#### Aim:

- 1. Provide learners with information about their progress in the course based on pre-defined milestones (e.g., assignments, quizzes, exams, projects, etc)
- 2. Show them their progress in relation to progress of the class (anonymous and accumulated)

#### Why motivational?

- assists with time management → increases confidence
- motivates learners to learn in the same (or quicker) pace as the overall class

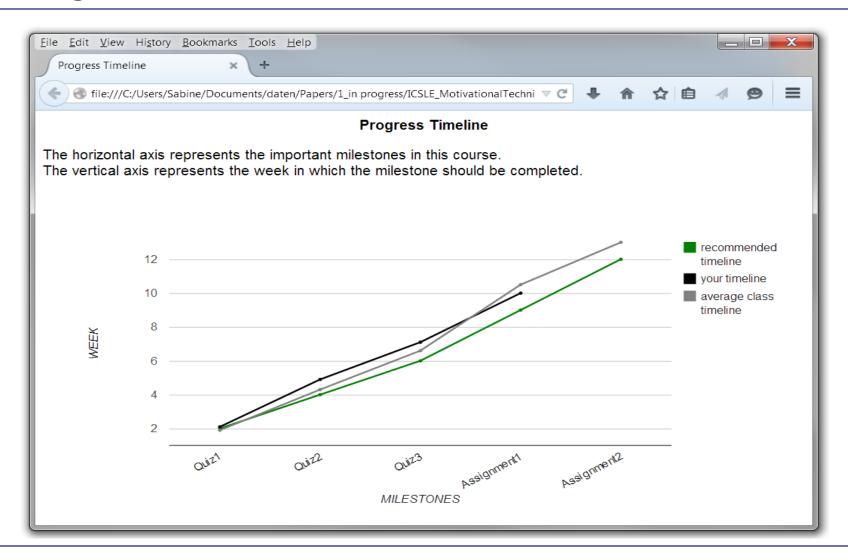
## Progress Timeline



- When can this technique be demotivational?
  - If learners have fallen behind, they might get impression that they cannot catch up
  - If too many milestones are remaining for them to complete
  - If nobody is at the same level as the learner
- Requirements for course and system:
  - Measurable milestones
  - Tracking of learners' completion of milestones
  - Access to start and end date of all learners







## **Progress Annotation**



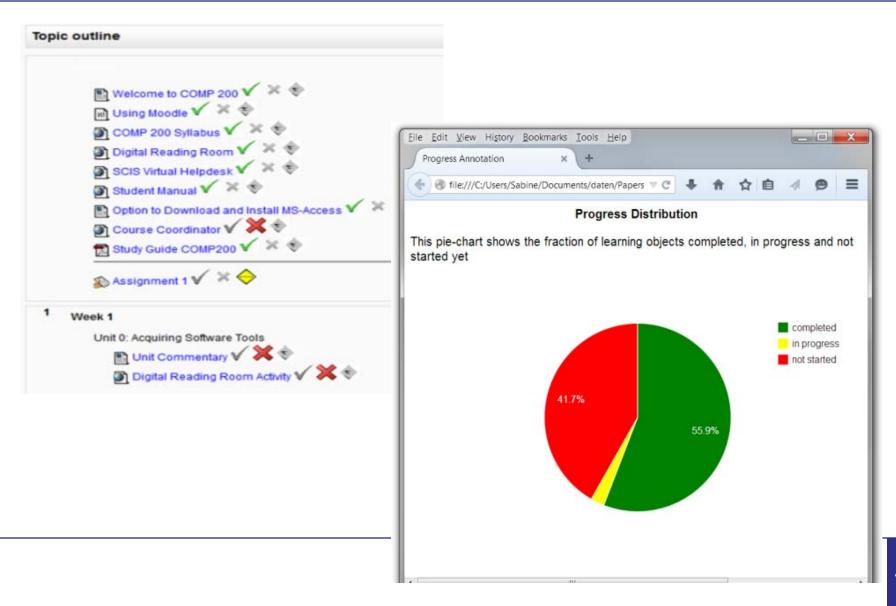
- Aim:
  - Display to the learner their progress through the course content:
    - 1. Allow learners to tag their active position in the course content
    - 2. Allow learners to tag the completed content
- Why motivational?

Learners can view and track their progress Helps in time management

- → increases confidence and satisfaction on achievements
- When can this technique be demotivational?
  - If learners feel they are not progressing fast enough, even though they put in a lot of effort
- Requirements for course and system
  - Course must have content







## Ranking



#### Aim:

- Rank learners based on certain criteria (e.g., performance, participation, etc.)
- Why motivational?

Show statistics and allow learners to compare themselves

→ Increases satisfaction

Some learners will use this information to continually improve

## Ranking



- When can this technique be demotivational?
  - If learners feel they should be doing better than they are
  - If they don't feel as though they have a sense of control
  - Since each ranking can be motivational for some learners but demotivational for others, personalization is an important issue
- Requirements for course and system:
  - There must be a minimum number of people enrolled
  - Criteria to use for ranking and track the respective achievements of learners based on the criteria

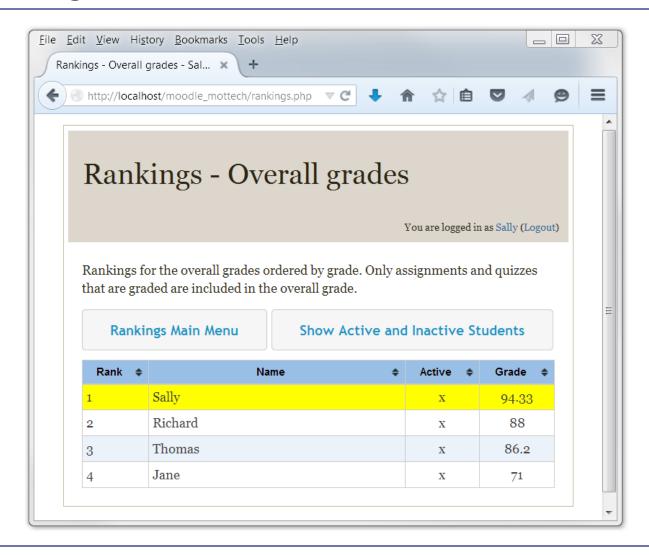
## Ranking



- Grades of assignments
- Grades of quizzes
- Overall grades
- Total number of awards achieved
- Overall time online
- Time online in current month
- Overall number of posts submitted
- Number of posts submitted in current month
- Overall post ratings
- Post ratings in current month
- Overall reading of all posts
- Reading of all posts in current month
- Amount of time it took to reach each milestone
- Pace to complete milestones







#### **Awards**



- Aim:
  - Provide learners with incentives and/or recognition
  - Based on achievements, scales or levels (e.g., different types of forum users)
- Why motivational?
  - rewards the learner and provide recognition to the learner >
    increases satisfaction
- When can this technique be demotivational?
  - If the learner finds flaws in the methodology
  - If the learner does not get the recognition that he/she believes to deserve
- Requirements for course and system:
  - Components that associate awards/achievements with them

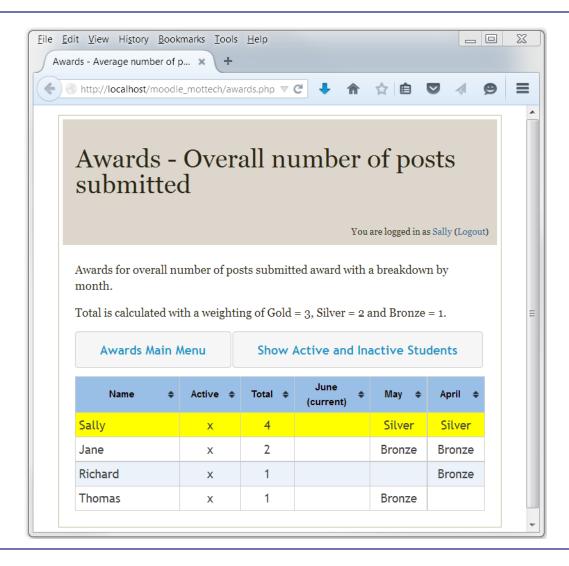
#### **Awards**



- Grades of assignments
- Grades of quizzes
- Overall grades
- Completed course milestones within a time period
- Overall time online
- Time online in current month
- Overall number of posts submitted
- Number of posts submitted in current month
- Overall post ratings
- Post ratings in current month
- Overall reading of all posts
- Reading of all posts in current month







## Tracking functionality



- To understand how students are using the motivational techniques, behaviour of students in relation to motivational techniques is logged
- The following information is logged:
  - Which techniques and subpages (e.g., for awards, etc.) the learner visited
  - How long the learner visited each page
- This information provides insights into how often the techniques are used by different learners in different situations
- This information can help to investigate, together with other data, whether students benefit from the respective techniques





- Careful testing through case studies has been conducted to verify each motivational technique in real situations
- Simulated data have been used

#### Conclusions



- We introduced the design and implementation of four motivational techniques:
  - Progress timeline
  - Progress annotations
  - Rankings
  - Awards
- The techniques are designed to be used in any course and learning system
- The techniques, together with tracking functionality, has been implemented within Moodle as blocks

#### Conclusions



- By providing multiple motivational techniques to students, they can select between different techniques that can increase their motivation at different stages and in different situations
- By tracking how students use these motivational techniques, we can gather valuable insights into when certain motivational techniques can be helpful for students with certain characteristics in certain situations
- Future work:
  - Designing and implementing additional motivational techniques
  - Investigating the use of motivational techniques by students with different characteristics in different situations



## Questions



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