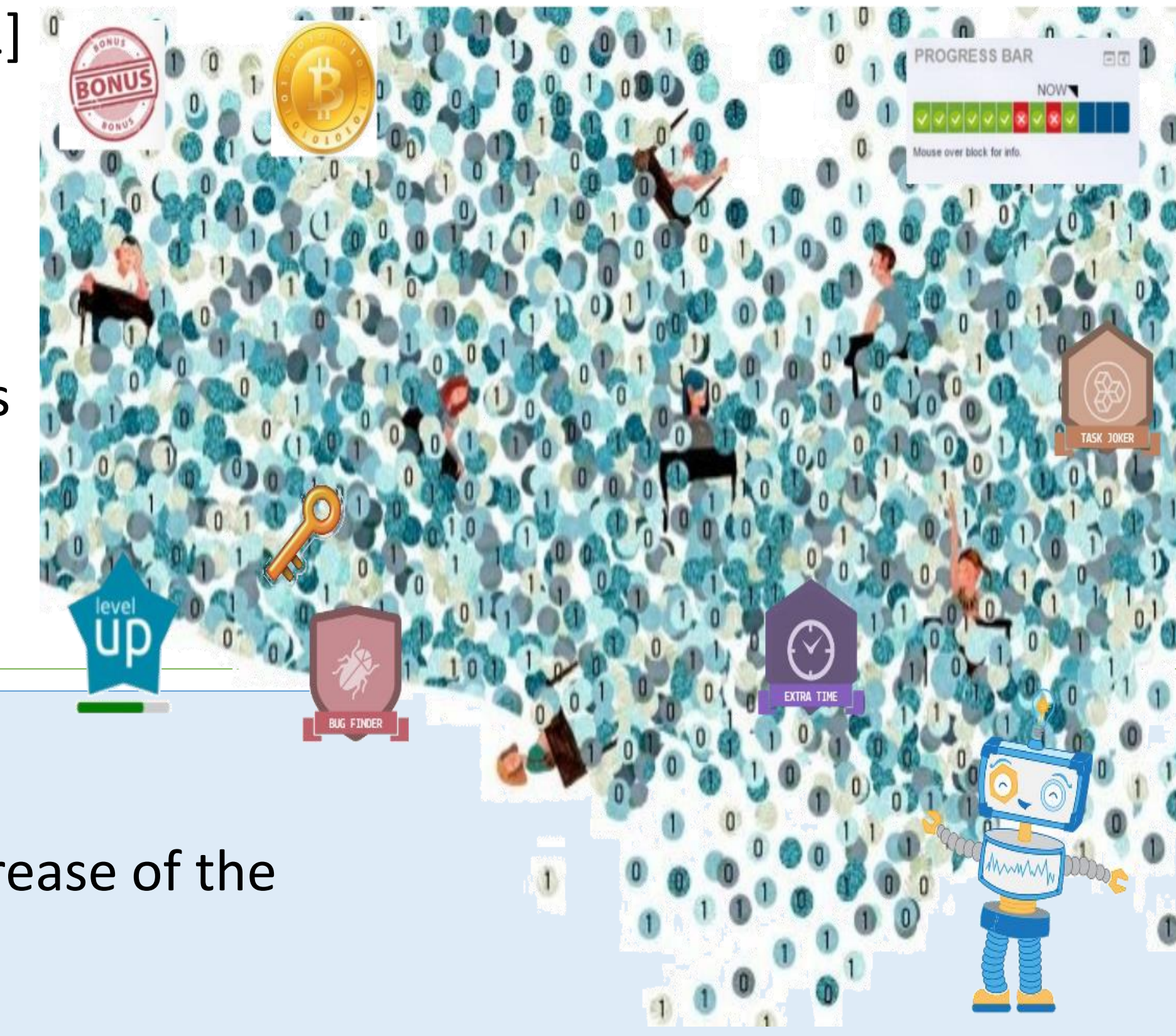


CONTRIBUTION TO THE ANALYSIS OF THE IMPACT OF SOCIAL LEARNING AND GAMIFICATION METHODOLOGIES ON HIGHER EDUCATION

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MOTIVATION

- Popularity of social learning (people learn from one another as they work together) enhanced by social tools. [1]
- Popularity of gamification (use of game elements and mechanics in non-game contexts to drive game-like engagement and motivation) for learning improvement. [2]
- Increasing interest in properly designed learning platforms which integrate contents, users and educational experiences in productive social learning environments enriched with gamification techniques.
- Popularity of learning analytics (data-driven approach for the rational improvement of the design and outcomes of the learning process). [3]
- Any methodology oriented to improve the motivation of the students and reduce the failure and dropout rates is welcome.



OBJECTIVES

General: Contribution to the analysis of the impact of social learning and gamification methodologies on the increase of the motivation and engagement of the students and the improvement of the learning results in higher education.

Specific:

- Knowledge about social learning and gamification methodologies, environments and experiences. Knowledge about learning analytics.
- Analysis of the impact of the social learning and gamification methodologies used in the context selected for the study (undergraduate and master level courses on Computer Networks).
- Proposals of improvements.
- Proposals of learning success/failure prediction methods, that allow timely pedagogical interventions and recommendations.

RESEARCH PLAN

- 1) Review of the state of the art related to social learning and gamification methodologies, environments and experiences.
- 2) Knowledge of the related functionalities and features of the two platforms selected for the study: SocialWire and Moodle.



- 3) Review of the state of the art related to learning analytics.
- 4) Knowledge of the functionalities of the R programming language to deal with them: visualization, data mining, social networks analysis, predictions, etc. [4]

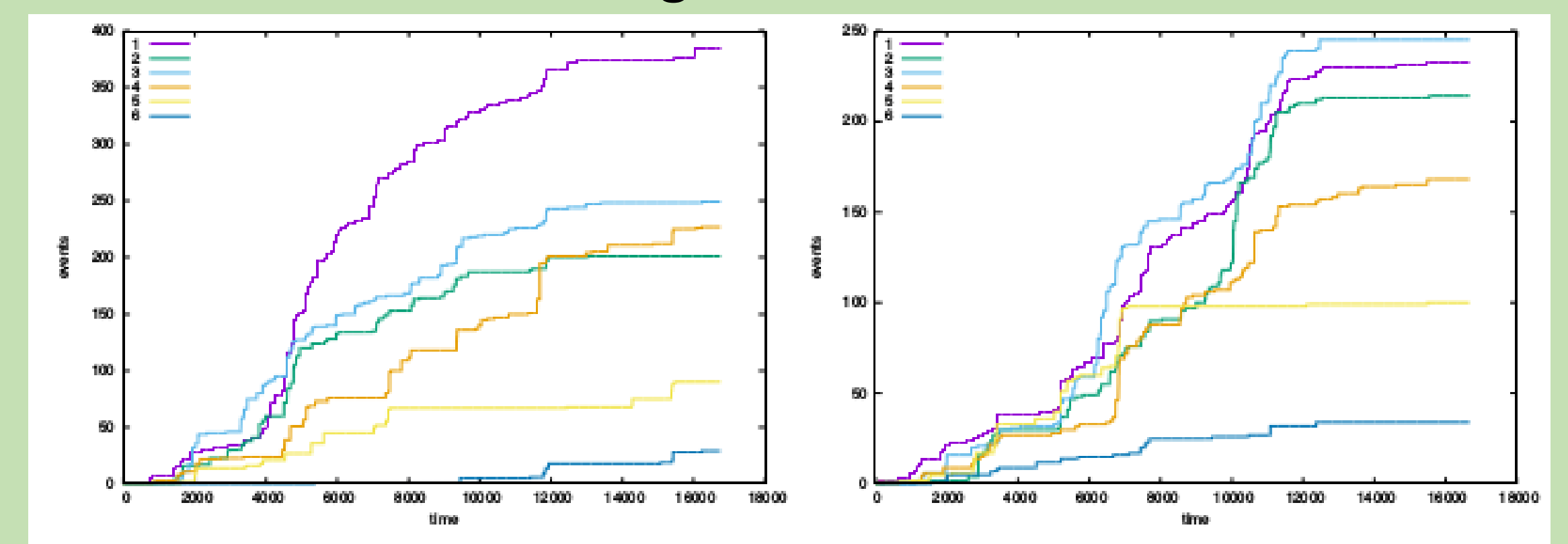


- 5) Knowledge of the dynamics of the courses selected for the study and identification of the difficulties that some students can have when faced with them.
- 6) Analysis of the effect of the social learning and gamification methodologies used in these courses in both platforms, in order to identify what activities and factors are more related to knowledge acquisition and final outcomes.
- 7) Depending on the results obtained, adjustment of the methodologies, improvements of the tools and/or search or development of new tools.
- 8) Proposal of success/failure prediction methods, based on statistical learning techniques, according to patterns of engagement and accomplishment of the students.
- 9) Preparation of articles that include the important partial aspects of the research, in order to be published in relevant conferences and journals.
- 10) Elaboration of documentation that can be included in the thesis report.

	1	2	3	4	5	6	7	8	9	10
First year	x	x	x	x	x	x			x	x
Second year		x		x		x	x	x	x	x
Third year							x	x	x	x

RESULTS

En [7, 8] we extend the study carried out in [5] about the impact of the social learning methodologies used in recent years in the undergraduate level subject (with SocialWire). An interesting result is that the slope of events a student is engaged in is highly correlated with the final grades and can be a good predictor of the final results. Maintaining the motivation and engagement of the students along the whole term is fundamental.



Accumulated events 2015/2016 (left) and 2016/2017 (right)

- 1) Best final grade, in the top-ten of the ranking;
- 2) Second best final grade;
- 3) First in the ranking, second-taking, passes the course;
- 4) Intermediate position in the ranking, passes the course;
- 5) Drops online learning activities in the middle of the term, fails the course;
- 6) Very low activity along the whole term in the platform, fails the course.

Performance of a prediction method about final result (failure or success), that combines three classifiers and uses as input the slope of events. (training set -> testing set)

		15/16 → 16/17	16/17 → 15/16
Accuracy	end of February	0.8608	0.8746
	end of March	0.8727	0.8676
	end of April	0.8523	0.9018
	end of May	0.8554	0.9194
Sensibility	end of February	0.9753	0.8851
	end of March	0.9871	0.9379
	end of April	0.9933	0.9706
	end of May	0.9962	0.9999
Precision	end of February	0.7851	0.9243
	end of March	0.7969	0.8421
	end of April	0.7514	0.8692
	end of May	0.7521	0.8739

NEXT YEAR PLANNING

- Extension of the study carried out in [6] about the impact of the methodologies used in recent years in the master level subject (with SocialWire). Analysis of the effect of using gamification techniques in parallel with social learning activities.
- Analysis of the impact of current social learning and gamification methodologies in both subjects (with Moodle).
- Proposals of improvement.
- Preparation of articles for submission to relevant conferences and journals.

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