

A System for Gamifying Ubiquitous Learning Situations Supported by Multiple Technologies

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Abstract. Gamification is the use of game design elements in non-game contexts, and it has reported potential benefits for students. However, the proposals supporting teachers to create gamified ubiquitous learning situations are tied to specific activities and enactment technologies. To start addressing this issue, we propose a system to help teachers design and deploy these situations involving a variety of technologies frequently used in education.

Keywords: Gamification, Ubiquitous Learning, Game Elements, VLE.

1 Introduction

Gamification is an emerging technique with potential benefits (e.g. helping drive students' behaviors or increasing their engagement) in different educational approaches such as ubiquitous learning [1]. Unfortunately, the proposals supporting teachers to create gamified ubiquitous learning situations (GULS) are usually tied to specific learning activities and enactment technologies (e.g. TaggingCreditor, ARIS or ARLearn). Teachers are thus forced to learn and use new specific technologies and activities which might not match with their practice. As a consequence, this limitation can constrain the adoption of GULS in real educational settings. To start addressing this issue, we propose¹ a system that supports the creation and enactment of GULS that may involve multiple spaces and a variety of technologies, including different VLEs (e.g. Moodle), web 2.0 tools (e.g. Google Drive), AR clients (e.g. Layar) and 3D virtual globes (e.g. Google Earth).

2 A Gamified System for Ubiquitous Learning

The proposed system named Gamified GLUEPS-AR, is the result of extending GLUEPS-AR [2], a system for the deployment of ubiquitous learning situations with third-party gamification platforms (GPs) such as Open Badges or Userin-fuser. Similar to its predecessor, Gamified GLURPS-AR uses an adaptor-based

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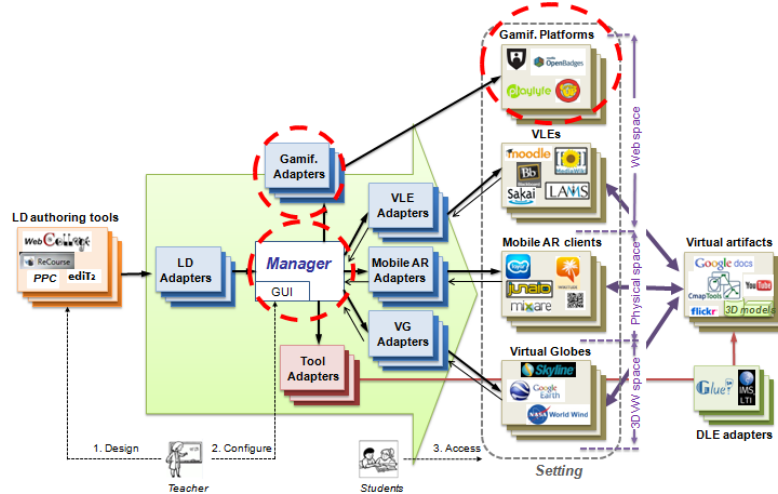


Fig. 1. Gamified GLUEPS-AR architecture. Dashed red circles show the extension.

software architecture (see Fig. 1). Thus, different gamification platform can be integrated by developing the appropriate adapters. Gamified GLUEPS-AR allows teachers configure the GPs, the game elements to be used (e.g. points and badges), the students' actions that are associated to game elements (e.g. fill-in an AR artifact), the rules that such actions have to meet (e.g. fill-in 5 artifacts) and the rest of technologies used in such ubiquitous learning situation. The proposed system can deploy in multiple gamification platforms thanks to an extension of the underlying data model of GLUEPS-AR [2] that includes GPs-related elements, including the concepts of *user*, *group*, *rewardable action*, *condition*, and different types of *game elements*. This data model enables the conversions required during the process of creating and enacting the gamified ubiquitous learning situations. We have developed an initial prototype of the system and validated some of the described functionalities through a proof of concept with fictitious users. As a future work, we plan further research for evaluating the approach with real teachers and students.

References

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MOTIVATION



How can teachers gamify their own designed ubiquitous learning situations involving existing educational technologies?

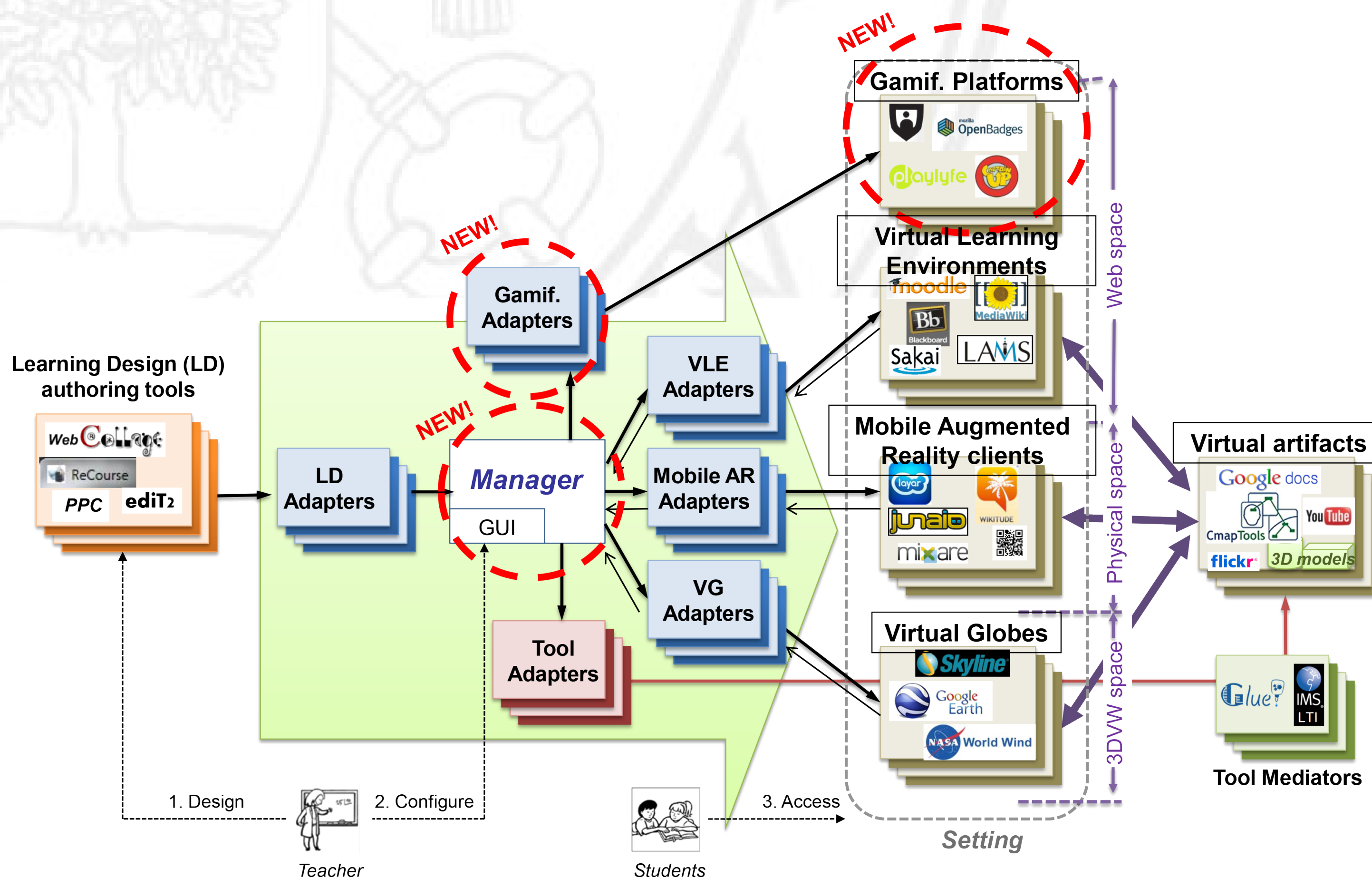


Limitations that hinder the adoption of gamified ubiquitous learning situations into teachers' educational practice:

- Current tools are tied to specific learning activities and enactment technologies.
- Current tools break with enactment technologies widespread in educational settings.

GAMIFIED GLUEPS-AR

ARCHITECTURE



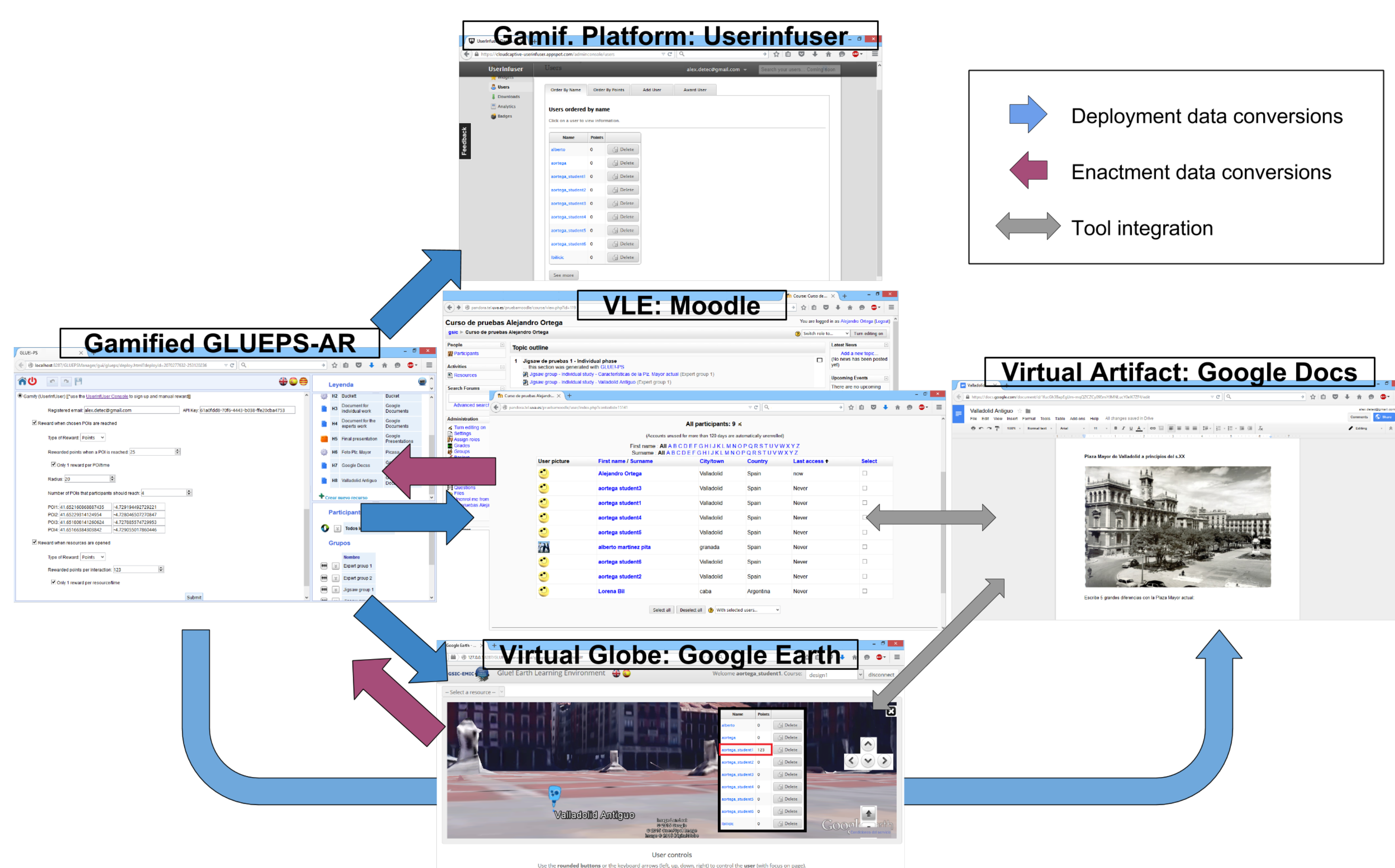
GAMIFICATION PLATFORMS DATA MODEL

Gamification Data Model	Existing Gamification Platforms						
	Userinfuser	Playlyfe	ITPrism	Playbasis	CaptainUp	BadgeKit	GiocoPro
Platform							
User	X	X	X	X	X	X	X
Group		X					
Action		X	X	X	X		X
Condition		X		X	X		X
Game Element Type	Many	Many	Many	Many	Many	Badges	Many

"X" means that the gamification platform implements the information element.

- The system can import learning designs configured by the teachers (e.g., jigsaw) with existing authoring tools.
- Gamified GLUEPS-AR allows teachers to gamify the learning designs, and to deploy them into VLEs, Web 2.0 tools, AR clients and 3DVG supported by gamification platforms.
- The system enables the runtime management of gamification elements during the enactment of GULS
- The architecture of the system is extensible so that new tools and technologies can be integrated by creating an adapter for the Gamified GLUEPS-AR.

VALIDATION: PROTOTYPE & PROOF OF CONCEPT



CONCLUSIONS & FUTURE WORK

- Gamified GLUEPS-AR allows to import, set up and gamify teacher-designed learning situations.
- Gamified GLUEPS-AR permits the deployment and enactment of ubiquitous learning designs with real-time gamification (i.e., rewards are automatically awarded, rankings are automatically updated).
- Gamified GLUEPS-AR is not tied to a specific enactment technology nor learning activity.
- * We plan to enhance the prototype and evaluate it with teachers in a real learning situation with students.
- * We plan to explore the scalability of the system to support more massive learning environments, such as MOOCs.

+INFO

