

# UMNIVERSITY PLATFORM - FOUR INTEGRATION VECTORS TOWARDS MOBILE LEARNING

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## ABSTRACT

There are currently two major trends in what higher education learning is concerned. The first is to respond to an increasingly mobile student population including those that are already working and need to improve their skills. The second is to model new pedagogical theories and practices that can contribute to better learning outcomes. Both try to adapt to a more distributed knowledge vision and to take advantage of how collaborative tools are shaping our work and lives in general. Instead of developing new theories, the Umniversity platform was developed so as to evaluate existing ones. Developed tools were motivated by current thinking about the future of learning and hopefully they will contribute to enable innovative practices helping shape future thinking. Four integration vectors are presented to accomplish this.

## KEYWORDS

Learning, mobile, connectivism, virtual world, autonomy

## 1. INTRODUCTION

To evaluate current major trends in higher education, student mobility and new learning theories, two initial assumptions were made. Firstly, that mobility in learning is more about people than about devices. More than having a mobile device, students tend to be mobile themselves using the devices they feel fit under each circumstance, not those that are imposed on them. Secondly, we chose connectivism as the learning theory, some call it pedagogical vision, on which we will orient our development as it seems the most suited in interpreting current reality and needs.

Four main integration vectors are described in their importance in a connected mobile learning environment and on how they are implemented in our tools. Vector 1 deals with data integration, vector 2 with managing simultaneous activities, vector 3 discusses multiple form factor issues and, finally, vector 4 defends how autonomy is important and how it is guaranteed. As a general purpose system, only time and practice will tell if Umniversity as a mobile platform reinforces, denies or is irrelevant in interpreting and supporting those two assumptions. Tests are under way at [www.umniversity.com](http://www.umniversity.com) but still in an early stage.

## 2. BODY OF PAPER

### 2.1 Vector 1: Integrating personal, professional and learning resources and activities.

Platforms called Learning Management Systems (LMS), of which Moodle is the most popular, make a clear separation between what is related to a certain course and what is not. This certainly happens in terms of resources but that clear cut is also present when hindering collaboration possibilities.

Resources, like documents, can be downloaded to local file systems where they can integrate with one's other resources/files, but then extra management is required and lack of synchronicity occurs when resources are updated locally or on the platform. Adding one's resources to the platform is also a bad option because of limited storage and lack of general information management tools.

This separation is even more noticeable when joining an outsider to the course for a casual input on some subject of his or hers expertise. Frequently, communication tools external to the platform are then used which

often brings with it eventual technical issues and thus poor attendance. Namely to support connectivism practices, this is a major drawback of current LMS implementations.

Umniversity is not a dedicated learning platform for it does not even exist as an independent tool being integrated in a general purpose environment called Umniverse. Tools, like *whiteboard* and *forum*, can be found for preparing and lecturing courses, enabling synchronous and asynchronous collaboration, to share resources but the environment itself is more of a personal information manager and was never meant to become a dedicated learning environment. Figure 1 indicates how Umniversity integrates with Umniverse.

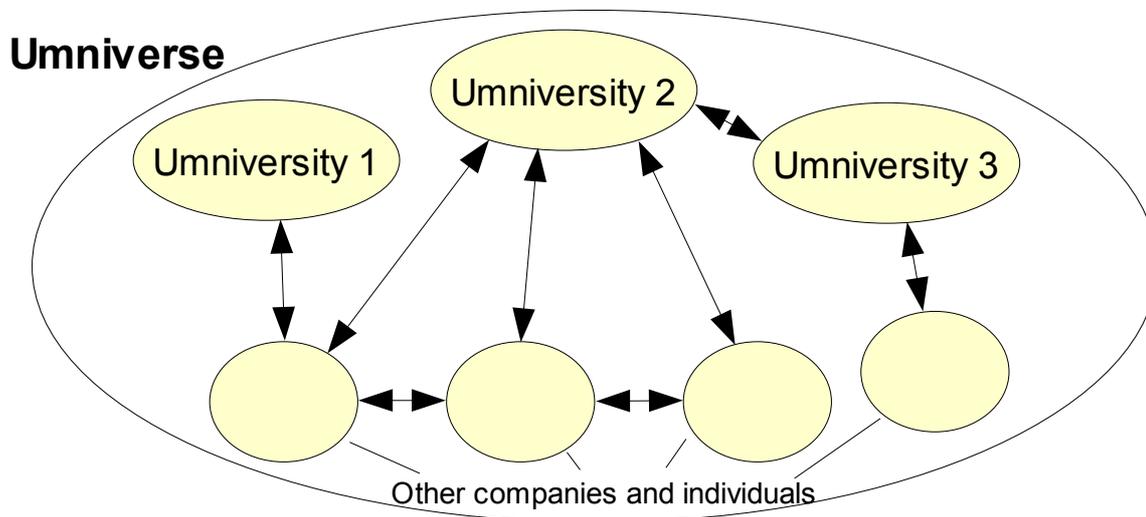


Figure 1 – Umniversity is part of Umniverse which can integrate other companies and individuals

This integration of all personal, eventually professional, and academic resources is also extended to the social networks of the user. These are available and manageable in a generic way with the possibility of easily interacting with one another. It becomes easy, and moreover natural, for a teacher to invite one of his colleagues on his work network to intervene in class. For this to happen easily certain assumptions need to be made: that colleague already uses the Umniverse system or a bridge exists between what he or she uses and Umniverse technologies. The latter is addressed with application programming interfaces (API) enabling exchange of data and activities among systems (using, for instance, Facebook and Twitter API). The former is much less restrictive than expecting our external expert to be familiar with or to learn our specific LMS.

## 2.2 Vector 2: Integrating and managing simultaneous and diversified activities.

In this multitasking world, it becomes less and less plausible that we can dedicate any considerable amount of time to one activity alone, even more so when such activity is tagged as "learning". Even when entirely dedicating our time to a course with distance learning tools, it is common that one have to respond to solicitations from more than a course or class that one is attending.

When using chat or forum systems we can easily respond and benefit from being in more than one "place" at the same time. Good management of information feeds arriving and of where you want to contribute with input is available in tools like Skype and Messenger. In current LMS this is not the case. When using the LMS from a single institution to collaborate in more than one course, and even more so when collaborating in different academic institutions (even having the same LMS), separate not integrated interactions are required often in distinct environments. Sometimes even the interaction paradigms vary.

Umniversity basic architecture is based on the Cloud. For an institution to make Umniversity available all it needs is to register at [www.umniverse.com](http://www.umniverse.com) with a valid institutional email address. For academia and students to participate they should also register, if not yet registered, directly at [www.umniverse.com](http://www.umniverse.com) and use this single registration to participate in their institutions' activities. These can or cannot be academic institutions for, let us not forget, one of Umniverse strengths for education is to be a general purpose tool.

An institution registration is exactly the same as an individual registration. In both cases a whole new

database is created which can easily be connected with all other available Umniverse databases. If students are attending two universities, as is now often the case in Europe with the Erasmus program, they can log in to Umniverse and access immediately resources and activities of both institutions if they have a Umniverse presence. This can be viewed as Google Groups with single sign-on with the added advantage that data resources are managed in the same collaborative environment.

Academic institutions can also have local servers running Umniversity/Umniverse but they should have them synchronized with the Cloud (for the above reasons and also as an easy and reliable backup).

### **2.3 Vector 3: Integrating different fixed, portable and mobile devices**

Accessing all resources and collaboration activities through a single system is an important step towards taking full advantage of the interconnected world of ours, namely for learning purposes. We now need to have access to this system in many different situations such as in class during a lecture, at home during the weekend, or while commuting between our daily activities.

For each situation, the device that is most appropriate can vary from a desktop computer at home with a big screen to a tablet computer or mobile phone in the class or on the train. Not only the device changes but usually the interaction paradigm has to change as well. One can use a web browser both in a high definition screen and on a smart phone but it seems ill suited to both devices because it does not take full advantage of the available screen size or because it mandates several zoom ins and zoom outs in the smaller screen.

Currently, the interface paradigm is indeed the greatest challenge. Having applications developed for different devices is today technically easy and even affordable, but it would be convenient for the user to take the most advantage out of the device at hand without having to learn different interaction paradigms. For Umniverse a 3D virtual world was the conceptual paradigm that was best found to fit this new age of multi-device and multi-tasking. It leaves behind devices that have a small often monochrome screen but it happens to excel in currently popular smartphones with screens with 640 by 320 resolution or more, as well as in tablets, notebooks and desktop computers.

For a greater operating system and device compatibility and for seamless transition among form factors, Umniverse uses the new WebGL browser standard technology. WebGL will soon come native in the most popular browsers whether for desktop or for mobile platforms. Thus, it requires no plug-in installation which is important for wide adoption lowering the technical entry barrier. In late 2011 no popular device will lack an available browser with WebGL support. Performance is already good for all kind of devices even if they don't have dedicated graphical processing units (GPU) with 3D acceleration hardware.

Not having yet achieved the flat learning curve that every user interface aims for, Umniverse has already achieved the most easy and natural transition for a user when changing device form sizes. A traditional windowed user interface is also available mainly for defining system settings rather than for normal daily use. Umniverse 3D conceptual model is still in an alpha implementation prototyping stage.

### **2.4 Vector 4: Integrating connectivity and autonomy**

While access to the Internet is essential, the fact is sometimes one is not connected. Even the power grid which is already a mature technology can not be everywhere, so battery and local power systems are used. Mobility is achieved if one can go where he or she wants to with the least dependency from external factors.

When going for a weekend into the mountains out of reach of even a cellular network, does this have to necessarily preclude one from studying e.g. didactic material? Do we have to remember to download all the resources we think we might need to our computer or mobile phone? Why can't we always have all the course resources synchronized locally so that we may access them no matter what connectivity is available? And what if a teacher wants to use a learning platform and the academic institution has none? And what if a certain class is taught outdoors away from the institution's network or where there is no Internet access?

Can't the same interactivity that enables students to participate in class using their mobile phones or computers be used in those situations?

The above problems are mostly solved if no unique dependency exists on the institution's servers or the Cloud system on which it is running. For that purpose, Umniverse allows applications to be installed in Java enabled computers and smartphones that replicate all the course information locally. Those applications can even act as stand alone servers easily creating local networks (either using dedicated hubs or some devices hotspot capabilities) providing the same level of interactivity as in traditional connected classrooms. One device can then become a complete local server. Some situations are depicted in figure 2.

Naturally, when connection to the institution's servers is available or to its instance on the Cloud, the changes must be replicated and eventual updating conflicts resolved.

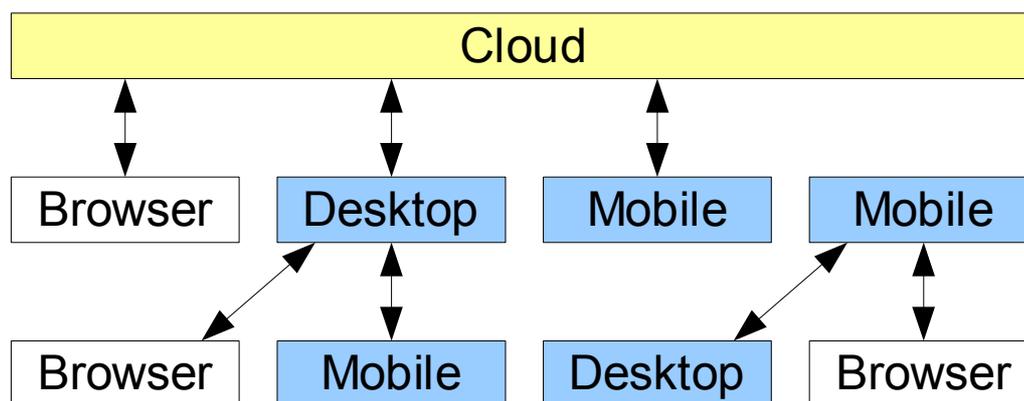


Figure 2 – Devices store data locally and can act as servers to other devices and browsers

### 3. CONCLUSION

Much of what Umniversity does is not unique. The level of integration achieved is what differentiates it:

- Repositories of academic resources have long existed. Its integration with other data makes it unique.
  - Collaborative tools exist. Umniverse multi-database single sign-on enables more activity and data access.
  - Universal interaction paradigms like the browser and 3D virtual worlds for learning already exist.
- Umniverse allows different worlds to interconnect with simultaneous and easily manageable activities.

Only real and effective use of any platform to assist in learning activities can highlight its virtues evaluating the assumptions it was based upon. Umniversity is a working contribution in improving learning outcomes through tools that adapt to new attitudes and people's recently acquired collaborative habits. For broader testing in all sorts of devices, recently introduced web technologies must become standard and mature.

As one of Umniversity aims is to facilitate connectivist oriented pedagogical practices, it should also be tested in massive open online courses (MOOC). It must be able to take advantage of the already integrated business oriented reporting tools for assisting teachers in easily and constantly applying analytics in their activities, namely using advanced big data mining techniques. Future goals remain: leveraging lecturers and students full potential through mobile learning so they achieve the most productive, enjoyable and useful learning outcomes having seemingly integrated tools so as to make technology a true facilitator.

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