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# Technical and pedagogical feedback on the deployment of an ePortfolio. Models of the uses, analysis and perspectives

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## Abstract

This paper asks how are being designed and expected modes of integration of students during and after their university studies in the specific context of development on private and public markets for applications such as e-digital portfolios.

She also questioned the manner in which to deploy the strategies and institutional policies regarding the choice of digital interfaces for the enhancement of learning and using the integration of students and in particular the way is taken into account the research dimension a tool to select and deploy.

To do this, it relies on a study conducted as part of e-inclusion project supported by the Office for Students professional insertion (BAIP) and funded by the University of Lorraine and the Regional Council of Lorraine. This study is based on monitoring of a panel of about 250 students and fifteen teachers experimenting "Lorfolio" in their regular educational setting. Lorfolio is a portfolio of digital skills remotely accessible, for all the assets of a territory, and being developed in Lorraine at the initiative of the Regional Council.

We propose in particular to highlight the returns through the use of specific questions that are generated when it comes to decide on their wide deployment of an institution, consortium or territory. What models to use is based does? What actual uses generates does? How to use these models and are they related to the digital strategies of institutions?

After recalling the context of the study, the actors and the methodology adopted, we will build on the first qualitative and quantitative analyzes performed to establish the first profiles of the perception of the tool from the point of view of students as teachers to measure the impact of such a deployment at institutional level.

## 1. Introduction

### a. Background of the study

As part of the research project funded by the university of Lorraine and the Regional Council of Lorraine, LISEC Lorraine Lab<sup>1</sup>, KIWI team<sup>2</sup> of LORIA and the department of the digital uses of the University of Lorraine propose to study, analyze and support the use of ePortfolio Lorraine, also known Lorfolio in the university.

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<sup>1</sup> <http://www.lisec-recherche.eu/>

<sup>2</sup> <http://kiwi.loria.fr>

It's about understanding how and give teachers and students mobilize the ePortfolio as part of lessons usually taught strategies around employability. In parallel, an analysis of traces of use should generate typical profiles of students uses. Profiles that will adapt the best features found on the interface and to add, if any, resources customized news relevant to learning conditions and needs of specific integration of students.

This study is based on the following assumptions:

- formalization of the activity conducted by students of their formal and informal learning helps facilitate their positioning for their employability.
- making available to students of an ePortfolio helps facilitate the formalization of their achievements and their visibility in the territory of Lorraine.

This multidisciplinary research contributions mobilizes science education that offer an analysis of the formalization of skills allied to the contributions of artificial intelligence in terms of modeling theory and uses of recommender systems. The results and prospects identified will be a basis for reflection by all departments of the University of Lorraine and components concerned with the employability of students.

To put the study in a broader context, we first redefine the concepts inherent in ePortfolio and we will review the implications and interactions and collaborations implemented between actors of this project.

## **b. ePortfolios by numbers**

Currently, the ePortfolio or digital portfolio is growing both in the educational landscape that professional. Regions, departments, universities, schools, professionals will endow this tool. Nevertheless, the identification of objectives and interests of such a tool does not come naturally to the user.

According to Thierry KARSENTI<sup>3</sup>, over 30 types of portfolio are identified (Developmental Portfolios, Reflective portfolios, Assessment Portfolios, Showcase Portfolios, Working Portfolios,...) with for each different purposes (show what has been learned, that one has reached the targeted skills, highlight reflexive work on their learning, show their skills in order to be evaluated, show that we continue to learn beyond the academic certification, showcases). To this, we can also add the difference made by the French Ministry of National Education between professional portfolio<sup>4</sup> (portfolio for teachers) and teaching portfolio<sup>5</sup> (students portfolio), which distinguish objectives centered on learning and objectives focused on Assessment i.e., process or product.

Regarding Long Life Learning (LLL), ePortfolio is a powerful teaching tool to formalize the collection and valorization of competencies (see in particular, LAYEC, J. (2006)). Long Life Learning takes an important place in training institutions, particularly at the university, and brings new practices self-assessment of formal and informal learning.

Thus, the ePortfolio, as a scalable set of materials, resources, ... ie the "sèmes", identifies an individual in its singularity. We can then speak of individuation as a process leading from the undifferentiated to individuate. It is then placed in the footsteps of many authors such as Arthur Schopenhauer and especially Carl Jung and more recently Gilbert Simondon. Consequently, ePortfolios are at the crossroads of two processes of individuation: individual and technology. Thus, ePortfolio should not be seen as a process itself but as an outcome of a process of individuation linking people and technology (Ravet, 2011).

## **c. The actors, between university policy and regional policy**

### **i. Regional Council of Lorraine**

The Regional Council of Lorraine is in a regional framework for economical development: « *To address the socio-economic challenges, the Region of Lorraine must address issues of vocational training based on three major principles :*

- *Enhance the human heritage of the Region,*
- *Give everyone the means to become subject and actor of his training course for its personal and professional development,*
- *Mobilize training players to enhance its human heritage.*

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<sup>4</sup> <http://www.educnet.education.fr/dossier/archives/portfolionumerique/usages-enseignement/portfolio-professionnel-de-lenseignant>

<sup>5</sup> <http://www.educnet.education.fr/dossier/archives/portfolionumerique/usages-enseignement/enseignement-superieur>

One objective of the Region of Lorraine was to offer each people to built a custom tool to enable it to capitalize experiences and training skills». From these words approved by the Regional Council of Lorraine in 2006, the Lorraine ePortfolio project is born.

Starting in 2007, the region of Lorraine entrusted at INFFOLOR<sup>6</sup> the realization of a opportunity and feasibility study for the development of a customized tool for capitalizing experiences and training. The choice was then focused on the development of an ePortfolio.

First, to realize this study and to take the appropriate decisions in terms of technical and ergonomic specifications of the ePortfolio, INFFOLOR has worked with two experts<sup>7</sup> in normalization and digital systems interoperability. Second, INFFOLOR partnered with LISEC Lorraine in order to carry an experiment for characterizing the first uses and to imagine first deployment scenarios.

## ii. University of Lorraine (UL)

The University of Lorraine has a Help Desk for students' professional integration (BAIP). It is a light structure designed to design the appropriate policies for a better professional integration of students. In this context, the research project "e-insertion" which aims to answer the question, «How digital environments can enforce professional integration strategies of the students?» aims, by its approach based on interdisciplinary research, to analyze the uses of populations of students et to offer tracks that will support the policy at the University of Lorraine level. The University of Lorraine eLearning department is also involved and works in the development of observation protocols and contributes to the analysis of results.

## iii. Laboratories

The research teams involved will work on complementary approaches based on uses modeling and qualitative analysis of pedagogical uses to have an analysis combining mathematical models of the real uses and qualitative analysis coming from questionnaires and interviews with both students and teachers. The diagram below shows the general process of interaction between the chosen approaches:

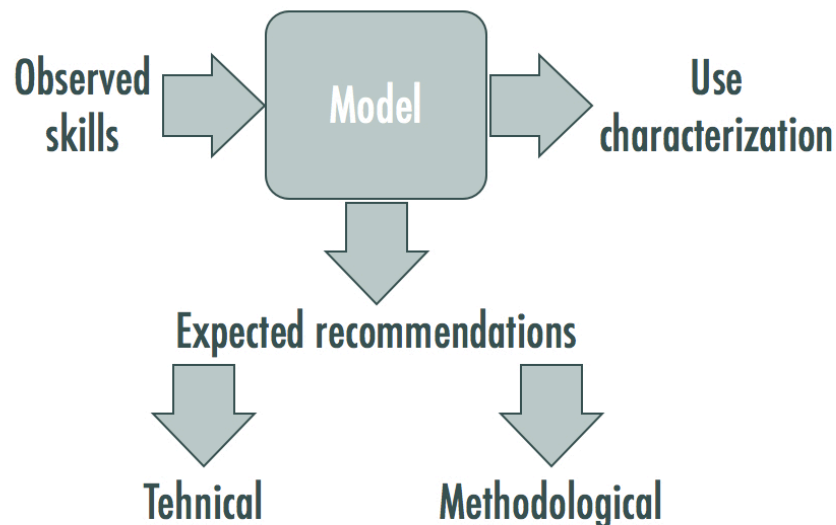


Figure 1. Modeling strategies

The objective of the work carried out in the KIWI (Knowledge Information and Web intelligence) team in LORIA aims to improve the quality of service provided by a computer based system (such as a corporate intranet, an online digital library, an information portal, the Internet, an ePortfolio, ...) to a specified user or not. The general approach can be outlined as follows:

- Learning models of user behavior, from the observation of their interactions with the system,
- From the observed behavior, planning actions that the system must perform in order to provide a customized service to user expectations.

It is part of a holistic approach for uses analysis which can be outlined as follows: To provide the accurate content at the right time is a key factor for an efficient delivering and sharing information systems.

<sup>6</sup> <http://www.inffolor.org>

<sup>7</sup> Monique Grandbastien, Bernard Blandin

Thus, recommender systems allow users to find resources that meet their needs by suggesting specific digital resources. Many approaches have been used to design recommender systems, including collaborative filtering, content based recommender, or users tracking by trajectories modeling in the recommender space. In this study, traces left by ePortfolio users will be the sets of data used to compute the models for the implementation of recommendation strategies.

ATIP Team (Activity, Work, Professional identity) in LISEC<sup>8</sup> laboratory is working on many learning processes having in common the links between activity analysis, identities and competencies in a professional environment. Whether the education market, social recognition of professional knowledge, procedures, guidance, work, the formalization of the activities of actors is at the heart of this research.

## 2. Applied methodology

The research is organized in three phases and includes three sets of qualitative and quantitative data:

- Set 1 consists of survey results, obtained before to the first use of LORFOLIO: survey by questionnaire carried out among 256 students who have been supported to elaborate their career plan (Personal and professional projects or specific course) and among 15 teachers.
- Set 2 contains first feedbacks from students and teachers. It also includes the analysis of the traces.
- Set 3 contains interviews with subsets of students and teachers after the end of the experiment.



Figure 2 – Project timeline

All the interactions generated between the structures (research, teaching, administrative) will help to show the various processes involved in the use of LORFOLIO. Below are represented actors, actions and expected results.

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<sup>8</sup> <http://www.lisec-recherche.eu/>

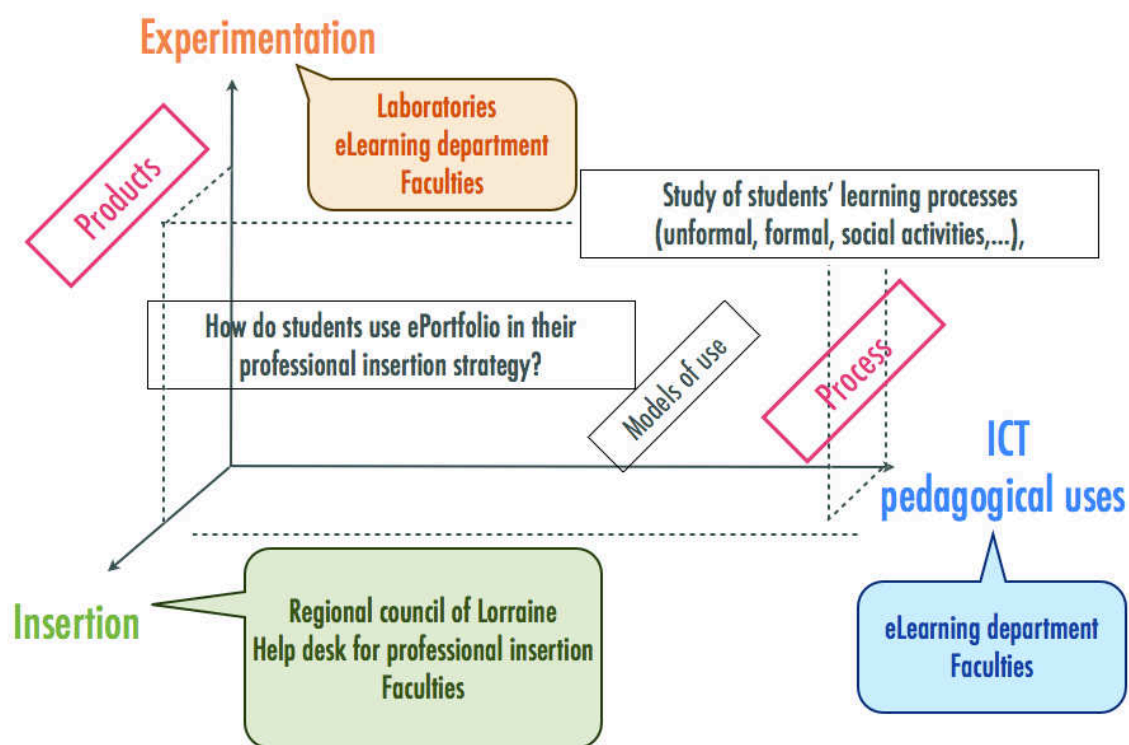


Figure 3 – Observation process

### 3. First results

#### a. Students – technological profiles

The analysis of the first set of data enables us to identify students' technological profile. Their privileged mean of communication is Internet with its different possibilities of exchange such as email, instant messaging and social networks as Facebook. The use of Internet is close to the use of mobile phones. Then, marginally, students use mail post and face-to-face exchanges.

The preferred sources of information are of three categories:

- Internet: it is difficult to know what are the used online resources; Internet has been used as generic with no precision even if many cited examples are « wikipedia » and « google » ,
- Traditional sources of information are Books, newspapers and sometimes libraries. We can also mention magazines, press and encyclopedia,
- Television

98% of the students surveyed have a personal computer and 7.3% of them share it with their family. Only 2% of students have no computer. The large majority (96%) used the Internet daily. 48% say they spend 2 to 3 hours per day on their computer against 30% who spend less than 2 hours.

They all have internet access. They say to connect from their mobile phone, WiFi hotspots in public places, streets, universities, among friends, at home and in restaurants ...

30% of students consider themselves "regulars trying to get by" and over 60% identify themselves as "regulars who know their way". 99% of them sent their first email before the age of 19.

Their Internet use can be classified into five categories listed below in order of importance:



- Social networks (140 occurrences) including « facebook » (135 occurrences)
- Videos (71 occurrences) including « youtube » (63 occurrences)
- Search engines (57 occurrences)
- Email (28 occurrences)
- Online music (18 occurrences)
- Online Encyclopedia (14 occurrences)

And marginally commercial, sport, news and entertainment websites.



Figure 4 – Preferred websites

Relating to job search, the best way they think to find a job is to use relationship. The words most frequently cited are:



Figure 5 – Best ways to find a job

Less than 9% use an ePortfolio. Most students cannot say what is an ePortfolio. For others, the functionalities of an ePortfolio are collecting competencies (regrouping, collecting, sorting, summarizing...) and presenting competencies (showing, highlighting, presenting) then marginally reflexivity (analyzing, self-knowing).



Figure 6 – Cited functionalities of an ePortfolio

## b. Students – log analysis for the period from October 2011 to January 2012

The goal of the users on this portfolio website is the construction of their cv and portfolio. To reach this goal, they have to perform some tasks, such as filling some personal information, competencies, etc. Each task may be made up of several actions. For example, filling personal information, can be divided into filling one page to provide with information about name, age, sex, and filling another page about address, phone number, etc.

The characteristic of this website is that the order of the actions that the users have to perform to build their cv is not predefined, they can perform them in the order that fits them the best.

The question we ask is if they tend to perform these actions in the same order, or if there are some prototypes of behaviors. More formally, by exploiting the logs of this website, we aim at discovering frequent sequential patterns of usage, if exist. To perform this task, we propose to exploit data mining algorithms (Han, 2006). Based on the assumption that the action a user performs at a given time on the website, depends on his/her past actions, we propose to exploit a K-order Markov Model (Rabiner, 1989). Such a model assumes that an action depends on exactly the K preceding actions. This model not only learns the sequences of actions of size K+1 that users perform, it is also a predictive model that may be used to predict the action a user should perform, given his/her last K actions.

This model may be viewed as too strict, as we can naturally imagine that an action may depend on less than the last K actions. Thus, we propose to exploit an all-kth-order Markov Model (Pitkow, 1999), which learns the sequences of actions of size from 1 to K and uses these sequences to predict the action a user should do.

Such models have been used to recommend actions in the frame of several domains, such as the Web (Deshpande, 2004), e-commerce (Lu, 2009)

On the observation period that runs from late October 2011 to January 3, 2012, visits of the website are mainly divided as follows:

- 234 connections, 229 only connected once and 21 connected 5 times

Finally, the sequences of most frequently visited pages are:



Over this period, we have obtained 21567 *5grams*<sup>9</sup> and 11094 are distinct. We chose *5grams* because they represent the optimal length of navigation within LORFOLIO. The most significant results show that:

697 *5grams* lead users to generate a resume (PDF and/or Word files)

207 *5grams* show navigation through competencies topics

119 *5grams* show navigation through training topics

Clearly, in the early days of the use of LORFOLIO, students have only export their resume to print it (PDF, rtf or sxf formats). Unfortunately, categories related to the formalization of competencies are not really used. This corresponds to the listed statements in the previous section.

### c. Teachers –pedagogical and technical skills

Teachers interviewed can be classified as "digital migrants". However, they are advanced users of the Internet, they are aware to leave traces on the networks and they are aware of the encountered. Unlike their students, they are not users of social networks. Thus, one of the teachers surveyed had already created personal web pages and only two teachers have profiles on social networks (facebook for one / facebook, viadeo and linkedin for the other).

They all indicate that the digital environment is essential for their educational and administrative activities.

Their objectives are then organized around three topics:

- Objectives rather focused on job search activity and the way to introduce it pedagogically, with the desire to standardize practices of students in job search (*write a resume, prepare a job interview, provide evidences,...*)
- Objectives rather focused on supposed prerequisites to get a job, most often presented in terms of knowledge to be acquired (« *Know company, the environment, ...* »)
- Objectives rather focused on students to help them to achieve reflexive posture (« *self-knowing, identify own means, ...* »)

Teachers surveyed consider ePortfolio through three dimensions: self-learning, self-evaluation, self-actualization.

For them, success regard to the professional insertion depends on two factors: on the one hand the mobilization of "good" means, ( traditional and networks) and on the other hand self.

Finally, according to their perception, added value of the ePortfolio is in its numerical characteristics (storage, ease of use, format) but especially in the educational opportunities it offers: "*different way to motivate students, to be efficient, communicate more widely.*"

However, they mention some risk: e risk of "formatting" the work done by the student, risk of standardization of documents produced, risk due to non respect of privacy.

## 4. Analysis of the results

Students have a digital profile quite different from that of their teachers, they are more familiar with social networks. However, they include only marginally the question of their professional integration in their use of the web and they seem unaware of the impact of their current uses on their present and future social visibility. Most of them count on their relationship (family, friends and professional) to find a job. When they prefer networks, they ask mainly to private networks. Finally, the analysis shows that LORFOLIO has been only used as a technical tool (to write a resume and to export it to text files).

From teachers' point of view, LORFOLIO is also seen as a tool (to produce documents related to a search for a job). But, the pedagogical considerations to support this production are mentioned in their speech. These two observations call for few remarks.

These observations need to recall Jean Heutte when he says in "le Livre Blanc" concerning the reflective process underlying the use of an ePortfolio.

*« Est considérée comme relevant d'une "démarche ePortfolio", toute démarche réflexive d'un étudiant sur son parcours, ses apprentissages, ses expériences, ses compétences ou encore ses réalisations et visant à capitaliser dans un environnement numérique un ensemble évolutif de documents et de ressources électroniques qui décrit et illustre toutes ces*

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<sup>9</sup> 5gram: Sequence of 5 different viewed pages

*dimensions biographiques* » (cité par Heutte,J, livre blanc, DGSIP TICE, MEN).

We can see that their expectations reach this objective even if the related pedagogical processes remain to be invented. Two main aspects have to be considered:

- To support of the process other than in the form of a transmission of knowledge
- To solve the problem they have to clearly identify what is related to professional integration strategy.

In this perspective, the implementation of the ePortfolio may then appear as a lever because teachers see it as a way to interest and to mobilize their students more.

The students whose responses show very clearly that they separate their personal and social activities of their academic activities, seem to develop a perception of their professional integration that does not predispose to a strong commitment to a reflective approach. It therefore remains to persuade them. The future results will show how teachers have set up their teaching methods:

- How a support system of this reflective work has implemented
- With what observations?
- What impacts on the students?

There is indeed much to expect from these experimental moments implemented in institutions.

Concerning the institution, the University of Lorraine, currently undergoing reconfiguration, intends to make the professional integration of its students one of its objectives and its major strengths. While it is too early to know what his policy on implementation of digital devices, the university has expressed strong expectations about the results of this experiment that ended in June 2012.

## 5. Conclusion

Have a combined analysis of the uses and perceptions of students and teachers through the implementation of a numerical tool which can be assumed that it will impact the process of individuation is an extremely rich field for observing the development of teaching practice.

The implementation of such a tool at the university is not trivial. Indeed, it appears attractive to teachers, due in part because they see it more fun, less austere, more readily used by students. However, the observed student practices show that the conditions for an intensive use of ePortfolios are not necessarily present. In particular, the pedagogical forms related to a reflexive approach remain to be invented. In this perspective, these experiments used to test and to formalize new forms of teaching. Some aspects have to be studied:

- Only one tool will not be able to support diversity of practices and teaching profiles
- What added value of the ePortfolio in face of professional social networks as LinkedIn?

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