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Using the TRAILER tool for Managing Informal Learning in academic and professional contexts: the learner perspective

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ABSTRACT

Informal Learning plays an important role in everyone's life and yet we often are unaware of it. The need to keep track of the knowledge acquired through informal learning is increasing as its sources become increasingly diverse. This paper presents a study on a tool developed to help keeping track of learners' informal learning, both within academic and professional contexts. This tool, developed within the European Commission funded TRAILER project, will further integrate the improvements suggested by users during the piloting phase. The two studied contexts were similar regarding the importance and perception of Informal Learning, but differed concerning tool usage. The overall idea of managing one's informal learning was well accepted and welcomed, which validated the emerging need for a tool with this purpose.

Categories and Subject Descriptors

K.6.1 [Management of Computing and Information Systems Programming Languages]: Project and People Management.

General Terms

Management, Measurement, Performance, Experimentation, Human Factors.

Keywords

Informal Learning, curricula management, competences,

motivation, knowledge management.

1. INTRODUCTION

Learning does not only take place within formal educational institutions. People learn throughout their lives, from experience, from reading or research, from conversations or observing others, from meetings, etc. [1]. The distinction between formal, informal and non-formal learning started being fostered in the middle of the last century [2], [3], [4]. According to recent studies, informal learning (IL) can account for over 75% of one's continuous learning throughout life [5], [6]. Even though most of the methods of IL have always been used, awareness of these methods, as contributors to learning and enhancers of competence development, is more recent [3].

IL happens anytime and anywhere. For the purpose of this work, two main IL contexts will be considered: the academic (institutions for higher education) and the professional (companies) environments. Peoples' goals in these contexts can be considered different. Most companies still focus solely on formal learning programs, thus losing valuable information on the know-how employees develop informally [4], [5] since many professional practices have been reported in the literature as being equally or even more effective, such as informal meetings or simply coffee breaks [6]. In fact, it can be considered paradoxical [7] that companies spend 80 % of their budget to re-qualify their employees by means of formal learning workshops and courses, while 80 % of what their employees are really learning, is learned through informal learning activities.

Regarding educational institutions, Digenti [8] notes that one of the ways that eLearning can help students to learn more effectively is by creating informal learning environments. However, most schools still focus only on formal learning programs, and in doing so fail to draw on know-how students develop by themselves [2].

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Cross [6] argues that since the initiative for IL lies with the learner, (s)he becomes more responsible, which makes the learning process more effective. The author states that employers should create a supportive organizational culture helping employees to develop and improve their skills, by facilitating IL processes within companies. In fact, this is in accordance with what is known as intrinsic motivation to learn [9]. In order to really develop competences on a deep level, learners must be intrinsically motivated to do so (otherwise they simply cover the subject in order to fulfill the necessary – imposed - requisites). In this sense, it becomes important to watch and harness the more informal methodologies students are using to develop their competences and expertise [3].

TRAILER project [10],[11], [12] is an ICT multilateral (two years) project funded by the European Commission, which aims at developing an innovative ICT-based service to be deployed in two contexts (professional and academic) and serving two fronts: learners on the one hand and employers/teachers on the other hand. [12], [13]. It allows learners to identify evidences of IL in relation to competences under development. Learners are able to decide what they would like to share with their employer/teacher. The circle closes with the employer/teacher working upon this information in order to support knowledge management, curricula management, finding the best suited person for a certain task, and rediscovering new competences within the company, amongst others.

This work analyses and cross-compares a number of academic and companies communities in four countries. In the academic context, higher education institutions from each country were involved in the pilot tests of the TRAILER tool. In the professional context, employees of various companies volunteered to take part following agreement of their employer to this collaboration. Section 2 of this paper starts with a summary of the tool line-up (from the learner perspective) and a description of the methodology used to analyze the pilot results. A cross-analysis is made between the two contexts and further discussed in Section 3, focusing on two topics: usage and the general idea behind TRAILER. Finally, some conclusions are summarized in Section 4.

2. METHODOLOGY AND CASES DESCRIPTION

2.1 TRAILER tool: the learner perspective

As already stated, the TRAILER tool serves two perspectives: that of the learner and that of the institution (employer/teacher). The cross-analysis presented in this paper only address the former. In using the TRAILER tool, the aim for learners is to collect evidences of IL, i.e. Informal Learning Activities (ILA's), and to associate them with competences being developed. These competences can either be those defined by the institution, or competences from a general list, or even new competences defined by learners, in case they find none adequate in the provided competence catalogue. This process can be undertaken in two stages: first, collecting ILA's and secondly, further describing and associating competences to those ILA's. The learners always decide which competences or ILA's they want to publish or keep private. The pilot testing of this tool was carried out with this line-up which is described in full detail in previous work [14], [15].

2.2 Methodology of Analysis

In order to test the TRAILER tool a case study approach was adopted [16]. We compare two major groups: one group with five cases from academic institutions and the other with also five cases from professional institutions (companies).

2.2.1 Cases characterization

Table 1 summarizes the case characteristics (for more detail see previous work [14], [15]). In the academic group, participants are freshmen, senior students or PhD students. For this group, the areas of expertise are mainly engineering and education. In the companies group, there are two engineering related companies, two state department companies (city council and military) and a training consultancy company.

Table 1. Study Cases characterization

Academic Pilot for Students	Company Pilot for Employees
PT_S	PT_C
Context: Engineering	Context: Engineering – Space, Energy, Transports and Health
Location: big city in Portugal	Location: big city in Portugal
Dimension: > 6000 S	Dimension: 12 E
1st year students	Typically with a degree or MSc
Ages: 18-25 years	Ages: 26-40 years
Universe: 30 S	Universe: 11 E
Sample: 14 S	Sample: 11 E
S2_S	S2_C
Context: Engineering	Context: Engineering - IT Specialists
Location: big city in Spain	Location: big city in Spain
Dimension: >40000 S	Dimension: 10 E
3rd year students	With high school or a degree
Ages: 18-25 years	Ages: 26-40 years
Universe: 20 S	Universe: 10 E
Sample: 20 S	Sample: 10 E
S1_S	S1_C1
Context: Education	Context: City Council – Informatics Department
Location: big city in Spain	Location: big city in Spain
Dimension: > 250000 S	Dimension: 1063 E
3rd year students	Typically with a degree
Ages: 18-25 years	Ages: 26-40 years
Universe: 74 S	Universe: 7 E
Sample: 15 S	Sample: 4 E
PL_S	S1_C2
Context: Education	Context: Military training (Virtual Learning Environment courses)
Location: big city in Poland	Location: big city in Spain
Dimension ≈40000 S	Dimension: 900 E
3rd year students	Typically with a degree
Ages: 18-40 years	Ages: 41-60 years
Universe: 13 S	Universe: 67 E
Sample: 11 S	Sample: 11 E
NL_S	PL_C
Context: Education	Context: Training - Consulting and Management (administrative workers, professional trainers and informatics)
Location: small city in Netherlands	Location: big city in Poland
Dimension > 25000 S	Dimension: 13 E
PhD students	Typically degree or MSc
Ages: 26-40 years	Ages: 26-40 years
Universe: 21 S	Universe: 13 E
Sample: 14 S	

The military group has the highest average age, with ages ranging from 41-60 years old, while all other are either in the 18-25 or 26-40 or both age ranges.

2.2.2 Data collection

The data collected during the pilots was related to different sources of evidence, in order to enable triangulation of results

[16]. Quantitative data were collected regarding platform usage as characterized by the parameters indicated in Table 2 USAGE. Besides, data were gathered through a pre and post-questionnaire in order to assess participants IL perception modifications (Table 2 PERCEPTION). A Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) was used in these questionnaires. Qualitative data were collected through focus group sessions held at the end of the pilot for each institution (Table 3).

Table 2. Case comparison regarding usage and learner perception of IL and the tool (in terms of higher and lower percentages/average scores)

		Academic Context		Professional Context	
		Higher results	Lower results	Higher results	Lower results
USAGE	Users/previewed	S2_S (100%)	S1_S (41%); PT_S (47%)	S1_C1 (100%); S2_C (100%)	S1_C2 (19%)
	Active users/users	PT_S (100%) NL_S (100%)	PL_S (64%)	S1_C1 (100%)	S1_C2 (69%); PL_C (67%)
	ILA's per user 1 st	NL_S (8.6)	PT_S (3.6)	S1_C1 (12.5)	PL_C (5)
	ILA's per user 2 nd	NL_S (6.8)	S1_S (1.8); PT_S (1.9)	S1_C1 (10.3)	PT_C (2.6); PL_C (2.9)
	Actions per user per day	PL_S (1); NL_S (1); S2_S (0.9)	PT_S (0.5); S1_S (0.5)	S1_C2 (8)	S2_C (1)
	Competences per ILA	PL_S (3)	PT_S (1); S1_S (1.1)	S1_C2 (4)	PT_C (1); S1_C1 (1)
	Published ILA's	S1_S (25%)	PT_S (4%); S2_S (4%)	PT_C (100%); S2_C (99%)	S1_C2 (60%)
	Published ILAs' competences	S2_S (50%); PT_S (50%)	PL_S (20%)	S1_C2 (80%)	S1_C1 (0)
Published user competences	S2_S (100%)	PT_S (0%)	S1_C2 (90%); S1_C1 (90%)	PT_C (30%)	
PERCEPTION	Recognition of IL before	PL_S (4.5)	NL_S (3.1)	PL_C (4.1)	S1_C1 (2.7)
	Recognition of IL after	PL_S (4.6)	NL_S (3.5)	PL_C (4.3)	S1_C1 (3.3)
	Usefulness	PT_S (4.3)	NL_S (2.4)	S1_C2 (4)	PL_C (2.9)
	Tool - Future use?	S1_S (4.1); PT_S (4)	NL_S (1.9)	S1_C2 (4)	PL_C (2.8)
	Tool – allows organization	S1_S (4); S2_S (4.1)	NL_S (2.6)	S1_C2 (4); S2_C (4.1)	PL_C (2.6)
	Tool – allows collection	S1_S (4.1); S2_S (4.2)	NL_S (2.5)	S2_C (4.2)	PL_C (2.5)
	Tool - Facilitates visibility, transparency and presentation	S1_S (4.7)	S2_S (2.5); NL_S (2.5)	S1_C2 (4.5)	S2_C (2.8)

Table 3. Case comparison regarding learners' opinions (favorable and unfavorable results)

		Academic Context		Professional Context	
		Favorable	Unfavorable	Favorable	Unfavorable
OPINIONS SHARED IN FOCUS GROUP (Main ideas)	Allows sharing IL with others	PL_S, PT_S		PT_C, S1_C1, PL_C	
	Benefits to manage competences in an institution	PT_S, NL_S, S1_S		S1_C2, S2_C	
	Benefits to manage human resources	PT_S, PL_S		S1_C1, PL_C	
	Time consuming		NL_S, PL_S		PT_C, S1_C1
	Memory aid	PT_S, NL_S, S1_S, PL_S		PT_C, PL_C	
	Aids organize curricula, better employment options	PT_S, S1_S, S2_S, PL_S		PT_C, PL_C	
	Useful in collaborative working environment	S1_S		PT_C, S1_C1	
	Usability needs improvement		PT_S, S1_S, S2_S, PL_S, NL_S		PT_C, S1_C1, S1_C2, S2_C, PL_C
	Why the need for 2 platforms		PT_S, S2_S, NL_S		PT_C, S2_C
	Too little time to test the tool		PT_S, NL_S		PT_C, S1_C2, PL_C
	Problem with duplicate words		PT_S, PL_S		PL_C
	Use the tool after some improvements, with more time to allow larger content	PT_S, S1_S, S2_S		PT_C, S2_C, PL_C	

3. RESULTS AND DISCUSSION

A summary of the results obtained for the parameters defined for the learner perspective in the two contexts, academic [14] and professional [15], is presented in Table 2 and Table 3.

In terms of usage (Table 2), the percentage of users and active users did not differ much in both contexts. However, looking at other parameters, more indicative of the quality of this usage, clearly scores are in general higher in the professional contexts. For instance not only the number of ILA's per user (1st and 2nd stage) is higher, but the lowest results are also higher than in the academic context. The number of actions per user per day confirms this pattern. The number of competences associated per ILA is also higher (even though less evident) but the same trend appears again when looking at the published ILA's and competences. This shows that participants from the professional context used the tool more significantly, going through all the steps. Even if they did not use it intensively, their usage was more in line with intended usage.

In terms of perception, students in the academic context reported better prior and posterior recognition of IL than employees. Even the lowest results are higher in this context. However, this difference was not apparent in the focus group sessions, where participants from both contexts stated having a good recognition of IL and equally identified benefits for their personal and professional lives. The usefulness of this type of tool is also more strongly emphasized in the academic context, with the exception of PhD students (NL_S case).

Learners from both contexts are less positive about the tool than the TRAILER idea in general, and no great differences emerged between them in this respect. This was probably related to usability issues reported by many participants in the focus group sessions. In these sessions, participants gave their opinion about the idea of TRAILER, its importance, the difficulties they had and the added value in using this type of tool. Usability issues mentioned by almost every participant referred to, for instance: limited choices in the activity type confused some participants, giving them the idea that only URL's were considered for collecting ILA's; the competence catalogue being far too extended, the competences characterization being too complex or the need of (too much) scrolling in managing long lists.

Other issues were also brought up, and even though they were not systematically repeated, they represent important aspects that should be taken into account. For instance, some concerns were raised regarding the usage that employers or teachers could make from this information; for instance, *what would happen if different people with similar technical competences use this tool to a different extent or in different ways? Should the employer or teacher rely on this information?* These questions are totally comprehensible since these users only experienced the tool from the learner perspective. Providing them a clear insight in the institution perspective might have taken away these concerns and related fears. Treating the two perspectives independently and not integrated in the same pilot testing, was a scheduling issue of the project, hindering more realistic participation in the pilots.

Organizing these results per case, some pattern is found related to the context or age of participants. Summarizing these results counting (for each case) the number of times they were identified and having scored the highest or the lowest punctuation, allows having a glance at the results coherence. In the academic context, regarding the age of the students (and degree year), it was clear that freshmen (PT_S) needed more support in understanding the

purpose of participating. The added value this kind of initiatives might have in their personal development was better understood by the students enrolled in the course for a second time (in the PT_S group). In fact, these few students really engaged with the tool and stated having a good perception of IL and its importance, and even shared some interesting ideas about improvements the tool might need. Higher results were obtained in senior students (S2_S, S1_S and PL_S). The case of PhD students is somehow different since they began from questioning the meaning of IL itself. Some of them stated that they were used to talk regularly with their supervisor and saw no need to have a tool like this. Their perception of IL and its importance was, by far, the lowest encountered. Perhaps these students are focused on their expertise and ways of developing it, that they do not feel the need (nor want it) to increase the entropy in their daily routines.

Regarding students' subject area, the two from engineering (PT_S, S2_S) do not show a pattern that differentiates them from the other three from education. The only apparent difference is that the former were more willing to use the tool after some improvements than overall the education participants.

In the professional context, a pattern related to the area of business is much clearer. The business context (PL_C) has lower usage and perception of IL and its importance than the overall of the other companies, more related to informatics. However, this company shared a favorable opinion about such an implementation in their daily routine, even more favorable than in some other cases. Interestingly, the two state departments showed higher values for usage and IL perception. In small companies the usage of the tool was lower, but, on the other hand, the number of published ILA's was more significant.

4. CONCLUSIONS

Comparing the two contexts, even though the percentage of active users was similar in both, employees displayed more quality usage of the tool although their perception of IL and its importance seemed less favorable based on the questionnaires. This perception scored higher in schools, but in the focus group sessions that difference was not clear, with both contexts generally affirming their knowledge about the role of IL in their lives.

Regarding the tool, learners from both contexts scored lower than they had scored the TRAILER idea, and no great differences emerged between them. This was probably related to the usability of the tool. All cases diagnosed several issues about usability that need to be overcome.

Regarding the students' age, it was clear that freshmen had more difficulty in understanding the added value of IL and the purpose of using the tool. On the other hand, so did PhD students, who even though demonstrating more quality usage of the tool, used it more in order to complete an assignment task than actually believing in its benefits, as can be concluded based on questions they raised about its purpose.

Regarding area of expertise, it was found that informatics-related working areas, especially in the case of employees, tended to generate better acceptance of the idea of trying out an improved version of the tool.

Some differences were found between small companies and the state department offices. The latter showed higher values for usage and IL perception, but in small companies the number of published ILA's was higher. This may be related to the fact that in a small company everyone knows each other better and probably

envisages this kind of sharing more naturally than in a big state department.

In general, every institution contributed with their experience and shared valuable data that will allow improving the tool to better suit learners' needs. The majority of cases were willing to try-out an upgraded version of the tool, as they felt it could be very important in the near future. However, this should be more prolonged usage in order to represent a more realistic and reliable scenario to evaluate IL needs and characteristics of employees and students in each institution. Another positive impact of richer information will be facilitating the search for colleagues with similar or complementary competences. To ensure the success of the new usage, the tool needs to be integrated in everyone's daily routine and be used for a longer period of time.

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