

## The e-portfolio as a facilitator of a diversified and reflective information competence\*

[Versió catalana | Versió castellana]

ELENA BARBERÀ

The Doctoral School and the eLearn Center  
Universitat Oberta de Catalunya  
[ebarbera@uoc.edu](mailto:ebarbera@uoc.edu)

JORDI QUINTANA, CRISTINA GALVÁN, JOSÉ LUIS RODRÍGUEZ ILLERA

Faculty of Education  
Research Group on Virtual Teaching and Learning (GREAV)  
Universitat de Barcelona

[jordi.quintana@ub.edu](mailto:jordi.quintana@ub.edu), [cgalvan@ub.edu](mailto:cgalvan@ub.edu), [jlrodriguez@ub.edu](mailto:jlrodriguez@ub.edu)

### Abstract

**Objective:** This paper identifies and analyses the categories of knowledge involved in the acquisition of information competence in a formal education setting, examining how this is enhanced by the use of a mixed e-portfolio/PLE. Our focus is on how the use of e-portfolios can help students develop systems of strategic or conditional knowledge.

**Methodology:** This qualitative study uses a semi-structured interview and attributes categories by inter-rater reliability coding and the organization of codes for quantitative representation. The interviewees were students from the Faculty of Education at the Universidad Católica de Temuco in Chile. The competences and categories are adapted from the International Federation of Library Associations and Institutions (IFLA).

**Results:** In higher education, there is often a focus on declarative and procedural learning, while more transversal, meta-cognitive competences are neglected. The use of e-portfolios helps students acquire the competences to assume greater control of their learning. For this reason, we have analysed the nature and volume of the content involved in the treatment of information competence through the use of mixed e-portfolio/PLE models and the importance of strategic processes in students' acquisition of transversal knowledge. We have also extended the IFLA system of categorization to include those processes of reflection and planning that show how students develop systems of strategic knowledge.

### Resumen

**Objetivo:** identificación y análisis de las categorías sobre el conocimiento implicadas en la adquisición de la competencia informacional potenciadas por el uso de un portafolio electrónico o PLE en un ámbito de educación formal, en especial, en relación con el desarrollo de procesos estratégicos o condicionales.

**Metodología:** análisis cualitativo mediante entrevista semiestructurada y atribución de categorías con codificación interjueces y organización de los códigos para su representación cuantitativa. La entrevista se realizó a estudiantes de la Facultad de Educación de la Universidad Católica de Temuco, Chile, y las competencias y la categorización de base utilizadas son las propuestas por la IFLA, con algunos complementos.

**Resultados:** en la educación superior se manifiesta una focalización en la enseñanza y el aprendizaje de contenidos declarativos y procedimentales ligados estrechamente a la materia de estudio olvidando competencias más transversales de alto nivel cognitivo. El uso de un portafolio electrónico o PLE favorece el desarrollo de competencias relacionadas con la autonomía del estudiante. Por ello se ha analizado la naturaleza y el volumen del contenido implicado en el trato de las competencias informacionales mediante el uso del portafolio electrónico o PLE y el lugar que ocupan los procesos de carácter estratégico en la adquisición del conocimiento disciplinario transversal. Ha emergido la necesidad de ampliar el sistema de categorización de la IFLA para dar cabida a procesos de reflexión y planificación relacionados con dicho conocimiento estratégico.

### Resum

**Objectiu:** identificació i anàlisi de les categories sobre el coneixement implicades en l'adquisició de la competència informacional potenciades per l'ús d'un *portfolio* digital/PLE (*e-Portfolio/PLE*) en un àmbit d'educació formal, especialment amb relació al desenvolupament de processos estratègics o condicionals.

**Metodologia:** anàlisi qualitativa mitjançant entrevista semiestructurada i atribució de categories amb codificació interjudges i organització dels codis per representar-los quantitativament. L'entrevista es va fer a estudiants de la Facultat de Educació de la Universidad Católica de Temuco, Xile, i les competències i la categorització de base utilitzada és la proposada per l'IFLA, amb alguns complements.

**Resultats:** en l'educació superior es manifesta una focalització en l'ensenyament i l'aprenentatge de continguts declaratius i procedimentals lligats estretament a la matèria d'estudi, i s'obliden competències més transversals d'alt nivell cognitiu. L'ús de *portfolios* digitals afavoreix el desenvolupament de competències relacionades amb l'autonomia de l'estudiant. Per això s'ha analitzat la naturalesa i el volum del contingut implicat en el tractament de les competències informacionals per mitjà de l'ús de *portfolios* digitals/PLE i el lloc que ocupen els processos de caràcter estratègic en l'adquisició del coneixement disciplinari transversal. Ha emergit la necessitat d'ampliar el sistema de categorització de l'IFLA per tal de donar cabuda a processos de reflexió i planificació relacionats amb aquest coneixement estratègic.

**Paraules clau:** Informational alphabetization, University education, Information management, Electronic resources, Learning and teaching methods

Rebut: 14/10/2015. Acceptat: 23/02/2016.

## Introduction

The *Digital Folder* (Rubio, Galván and Rodríguez Illera, 2013) is a platform for the generation of e-portfolios which the Education and Virtual Learning Research Group-GREAV of the University of Barcelona has been using and improving since 2006 by applying it contextually in university subjects, monitoring it and analysing and reflecting on its contribution to students' learning, in particular to the development of competencies.

The research carried out into the contribution of the *Digital Folder* platform to the improvement of evaluation and learning (Rodríguez Illera et al. 2011; Rubio and Galván, 2013), and to the development of cross-cutting competencies such as the selection and organisation of information, reflection on learning, the planning of learning and the development of digital competency (Rodríguez Illera, Galván and Martínez, 2013; Rubio and Galván, 2013) led to the "Design of an e-portfolio/PLE hybrid environment for the development of cross-cutting competencies" (Rodríguez Illera et al. 2014).

Today, with the new tools and functionalities incorporated in the original *Digital Folder*, such as the calendar, access to social networks and RSS channels, the facilitation of the monitoring and personal control of the competency domain, the inclusion of a small integrated text editor, the possibility of sharing portfolios, etc. (Martínez, Rubio and Galván, 2015), the application has increasingly shifted towards the Personal Learning Environment (PLE) concept, thereby facilitating the development of complex competencies (Barberà, 2005), competencies of a cognitive and metacognitive nature (Barberà, Gewerc and Rodríguez Illera, 2009), competencies associated with motivational and emotional processes (Steffens, 2001), and those related to the self-regulation and self-management of learning (Llorente, 2013; Chávez, 2014).

Galván et al. (2015, p. 316) analysed the contributions made by the new tools of the e-portfolio/PLE to (among other aspects) the development of information selection and organisation competencies, concluding that "as regards the information management competency, the actions carried out more or much more than before are: selecting the documents required for the portfolio activities (62.3%); selecting web pages (49.1%); selecting social networks suitable for the activities (47.5%); and selecting relevant information for the activities (52.5%). The functions that have served best to develop the information management competency with the platform are: academic tasks (60.6%); the teaching portfolio (59.0%); dialogue (52.4%) and Internet resources (47.6%)."

On the basis of this evidence, we decided to carry out a comprehensive analysis of the contributions of the work completed with the e-portfolio/PLE to the general development of information competencies and their contextualised use in learning processes, information competencies being understood as a "structured set of dispositions and beliefs through which information is accessed, evaluated, used and communicated, built on the history of the subjects in situated learning contexts" (Barbosa et al. 2010, p. 32) and, therefore (in an integrated and contextualised manner) the cognitive, procedural, attitudinal and social aspects of the competency.

Our starting point in relation to the development and application of the information competency was Kuhlthau's Information Search Process proposal, which initially (Kuhlthau, 1991) comprised six stages (Initiation, Selection, Exploration, Formulation, Collection and Presentation) but later incorporated a seventh and final stage: Evaluation of the process (Kuhlthau, 2013). Kuhlthau's proposal mainly focuses on initial processes, ignoring more cross-cutting competencies with a high cognitive level related to information management processes and the attribution of meanings, and directly related to the contextualised "transformation" of information into own knowledge.

We then compared Kuhlthau's proposal with that of the International Federation of Library Associations and Institutions (IFLA). This proposal focuses on the Development of Information Skills (DIS) for lifelong learning (Lau, 2007) and enjoys a high degree of international consensus. It comprises three core dimensions: access, evaluation and use of information. This library and information science approach includes clear references to the processing of information; specifically, the "Evaluation of the information" component includes, among others, the analysis, generalisation, interpretation, selection, synthesis and organisation of information.

Having analysed and compared these two proposals, and before opting for one of them, we also studied the proposal of the Society of College, National and University Libraries (SCONUL), which focuses specifically on higher education (SCONUL, 2011) and has served as the basis for many proposals of the CRAI (learning and research resource centres) of Spanish universities, and the proposal of the Inter-Sectoral Joint Committee of the ICT Sector of the Conference of Rectors of Spanish Universities (CRUE-TIC) and of the Network of Spanish University Libraries (REBIUN) (CRUE and REBIUN, n.d., n.p.).

After analysing and comparing each of them (see Table 1), we decided to use the IFLA's proposal of three core classification components in our study, together with some additional elements and details. Our proposal is entitled IFLA/GREAV-1:

- 1) **Access:** The user accesses the information effectively and efficiently (searches, locates, observes, analyses, selects, validates, retrieves, etc.).
- 2) **Evaluation:** The user evaluates and processes the information critically and competently (manages, classifies, organises, evaluates, reflects, connects, filters, etc.).
- 3) **Use:** The user applies the information accurately and creatively (uses, communicates, expresses, creates, shares, disseminates, etc.).

Information Search Process: Kuhlthau, 1999 and 2013.	Development of Information Skills of the IFLA: Lau, 2007.	The Seven Pillars of Information Literacy in Higher Education: SCONUL, 2011.	Information Competencies: CRUE and REBIUN, 2014.	Information Competencies, IFLA/GREAV-1.
<p><b>1. Initiation:</b> recognises the need for information.</p> <p><b>2. Selection:</b> selects or identifies the general topic.</p> <p><b>3. Exploration:</b> investigates information on the general topic.</p> <p><b>4. Formulation:</b> formulates objectives.</p>	<p><b>1. Access:</b> defines and articulates the need for information.</p>	<p><b>1. Identify:</b> identifies a personal need for information.</p> <p><b>2. Scope:</b> assesses current knowledge and identifies gaps.</p> <p><b>3. Plan:</b> constructs strategies for locating information and data.</p>		
<p><b>5. Collection:</b> gathers information on the objectives.</p>	<p><b>Locates</b> the information.</p>	<p><b>4. Gather:</b> locates and accesses the information and data needed.</p>	<p><b>1. Searches</b> for information.</p>	<p><b>1. Access:</b> the user accesses the information effectively and efficiently (searches, locates, observes, analyses, selects, validates, retrieves, etc.).</p>
	<p><b>2. Evaluation:</b> evaluates the information and <b>Organises</b> the information.</p>	<p><b>5. Evaluate:</b> reviews the research process and compares and evaluates information and data.</p> <p><b>6. Manage:</b> organises information professionally and ethically.</p>	<p><b>2. Evaluates</b> the information.</p> <p><b>3. Organises and manages</b> the information efficiently.</p>	<p><b>2. Evaluation:</b> the user evaluates and processes the information critically and competently (manages, classifies, organises, evaluates, reflects, connects, filters, etc.).</p>
<p><b>6. Presentation:</b> concludes search and presents the results.</p>	<p><b>3. Use:</b> uses the information and <b>Communicates</b> and makes ethical use of the information</p>	<p><b>7. Present</b> applies the knowledge gained, presenting the results of research, synthesising new and old information and data to create new knowledge and disseminating it in a variety of ways.</p>	<p><b>4. Uses, publishes and disseminates</b> the information, abiding by ethical and legal norms.</p> <p><b>5. Keeps up to date with and shares</b> networked information.</p>	<p><b>3. Use:</b> the user applies the information accurately and creatively (uses, communicates, expresses, creates, shares, disseminates, etc.).</p>
<p><b>7. Evaluation:</b> evaluates the process.</p>				

Table 1. Comparison of stages/phases of the Information Competency

## 2 Objectives, hypothesis and methodology

The objective of this study is to identify the composition of the information competency developed through the use of the e-portfolio/PLE in the university education environment. Specifically, given that the e-portfolio/PLE is an instructional tool which facilitates the regulatory acquisition of knowledge, we aim to explore the evidence of learner input in relation to the reflective acquisition of the information competency.

Consequently, the working hypothesis refers to richness in the process of acquiring the information competency through an e-portfolio/PLE, in such a way that students develop a variety of sub-competencies (not centred on an information dimension) corresponding to the different dimensions of which the competency is composed. Complementary to this, it is expected that through the use of the e-portfolio/PLE, students will incorporate reflective actions on information access, evaluation and use which constitute strategic behaviour in relation to the development of the information competency within the framework of higher education.

For this purpose we have developed a semi-structured interview (see Appendix 1) which we have conducted with social science students who use the university's own e-portfolio/PLE in their degree subjects. Ten students were selected for in-depth interviews, which were transcribed in full for analysis. The aforementioned students, who carry out their studies at the Faculty of Education at the Universidad Católica de Temuco, Chile, constitute an intentional representative sample of the work and approach of their colleagues, being students willing to collaborate in the research. The answers to the interview questions have been classified by three of the researchers and have been segmented according to core themes. The

internationally recognised system of the IFLA (Lau, 2007) for the classification of the information competency has been applied as an instrument of analysis.

The IFLA classification of the information competency enjoys a high degree of international consensus and comprises three basic dimensions: access, evaluation and use of information. The initial classification basically comprises the three aforementioned dimensions, with six categories and a total of 23 sub-categories, which constitute the basic codes of analysis in the present research. The classification is shown in detail in Appendix 2.

The analysis of the interview answers consisted of the attribution of the dimensions, categories and sub-categories by four different raters, in such a way that each interview was analysed by two raters in double-blind format who had to have the minimum possible number of matches as a rater pair in order to avoid possible bias in the analysis of the interviews.

Once the category attributions and their consistency had been checked, the researchers decided to share the analysis in order to check for limitations in the attribution of codes and to identify any emerging categories or sub-categories. As we progressed in our analysis of the interviews, we identified the need to include a stage prior to those listed by the IFLA and coinciding with the initial stages of Kuhlthau and the SCONUL (see Table 1), namely the planning of the search for information and its use. This stage was incorporated in a second review of the interviews. We formulated the identified stage as a new dimension, defined as dimension 0) Planning, which can be considered one of the contributions of our research. The user prepares the processes involved in the acquisition of information (preparation, specific details of the product, information organisers, etc.).

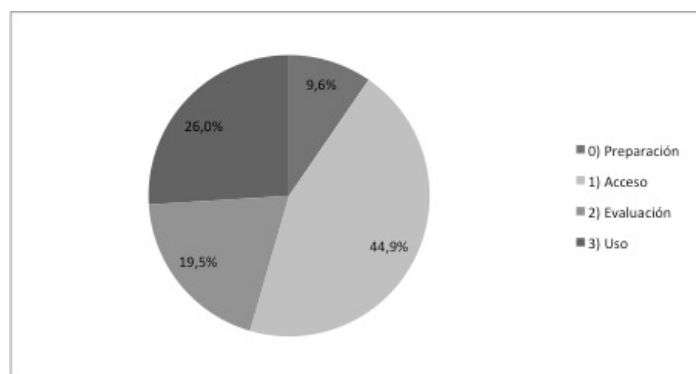
### 3 Results and discussion

The results presented below are taken from the ten semi-structured interviews conducted with students of the UCT, asking questions related to the topics which we wished to explore (objectives and resources for the task, information processes developed by the students and use of social software, mainly). The number of questions asked depended on each student's answers, varying between 132 and 300 questions ( $\bar{x} = 198$ ). The interviews yielded a total of 1978 answers.

In the detailed analysis of the interviews, carried out by two raters in each interview (there being four interviewers in total with the minimum possible number of matches in rater pairs, coding independently and separately), 194 answers were identified (9.8%) which were relevant to the area of information competencies. These were initially attributed to the three aforementioned dimensions (Access, Evaluation and Use, which we have called IFLA/GREAV-1 in Table 1), with a total of six categories (two each) and 23 sub-categories (8, 7 and 8, respectively). Furthermore, 323 concepts were identified within the 194 relevant answers provided by the students.

As we have explained above, over the course of the analysis of the interviews and the identification of the 323 concepts, a new stage gradually emerged, sequentially prior to the three stages of IFLA/GREAV-1, which we called stage 0. This new stage has generated a new dimension, related to Planning. As such, the classification basis for our study was modified to incorporate this fourth dimension, with the following configuration: 0) Planning; 1) Access; 2) Evaluation; and 3) Use. We called this modified basis IFLA/GREAV-2 (see Table 4). Following this incorporation, the analysis was carried out with four dimensions, nine categories and 23 subcategories (see Appendix 2).

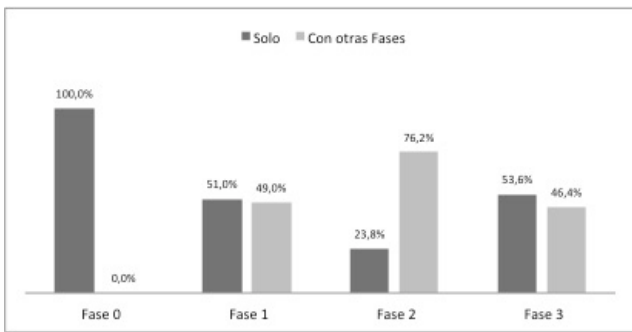
Of the 323 identified concepts related to the four aforementioned dimensions, 9.6% impact on Planning, 44.9% impact on Access, 19.5% impact on Evaluation and 26.0% impact on Use of information.



Graph 1. Impact of the e-portfolio/PLE on the four dimensions of the IFLA/GREAV Information Competency

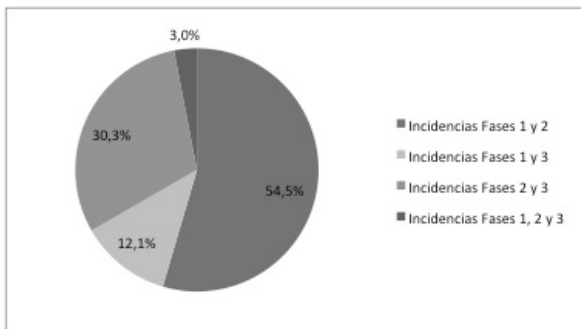
The predominant impact of the concepts on dimension 1) Access coincides, to a large extent, with the results of the study by Galván et al. (2015), in which the selection of information was one of the most relevant actions facilitated by the use of the e-portfolio/PLE.

In relation to whether these impacts were exclusive to one of the four dimensions or shared between them, we found that those related to 0) Planning are exclusive to this dimension and that those related to 2) Evaluation are mostly associated with other dimensions, while those related to 1) Access and 3) Use are reasonably well balanced.



Graph 2. Exclusive and shared impacts of the e-portfolio/PLE on the four dimensions of the IFLA/GREAV Information Competency

In Graph 1 we have shown that 9.6% of the answers were related to dimension 0) Planning. We can also affirm that they were exclusively related to the said dimension, whereas 10.2% of the answers combined more than one dimension (1 and 2; 1 and 3; 2 and 3; or 1, 2 and 3), as shown in the graph below:



Graph 3. Impacts of the IFLA/GREAV Information Competency shared between the four dimensions

The dimensions that are simultaneously referenced, with the greatest intensity, are 1) Access and 2) Evaluation, followed by 2) Evaluation and 3) Use, highlighting in both cases that they are dimensions related to correlative stages, and with justified sequential progression.

Some of the comments made by students in relation to Planning were based on the assertion of the importance of having beforehand a "learning guide" [Ca, Cr], preferably provided by teaching staff, or "guidelines" [Ca, Co, Na] to facilitate the tasks ("I always look at the guidelines because I tend to beat about the bush" [Co]). Meanwhile, others acknowledged the importance of keeping in mind the objectives of the tasks ("Because the objective of what you're going to do must always be present" [Ca]).

Another emerging element worth highlighting is the reliability of the sources of information used by the students, which is associated both with dimension 1) Access (Sub-category: Identifies and evaluates potential sources of information), and with 2) Evaluation (Subcategory: Determines which is the best and most useful), which some students refer to when answering the question of where they search for the information they need, how they select it and why they view certain kinds of pages rather than others, these being:

Google	34
Internet articles	16
YouTube	16
Scielo	12
Wikipedia	11
Google Scholar	9
Bibliography	7
Internet	6
Google Books	4
Ministry pages	4

Redalyc	1
Scopus	1
Scientific articles	1

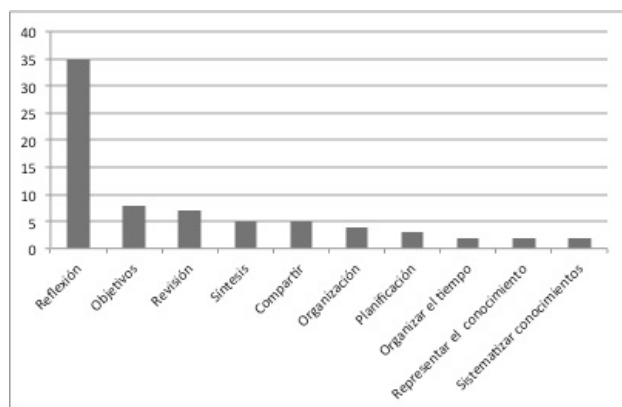
Table 2. Reliability of the information

Although the data extracted from the answers of the ten students is interesting, especially the place occupied by the Scientific Electronic Library Online (SciELO), Wikipedia or Google Scholar, we consider that direct online searches or "Googling", as the students call it, highlights a lack of planning and a failure to employ strategic information search techniques.

As regards processes related to the organisation, management and processing of information, also included in dimension 2) Evaluation, some students explain, on the basis of reflection, how they incorporate and use the selected information. By way of example, we find the following comments: "I hardly ever use exact quotes. Look, I always make an interpretation of what I read. And I cite it by paraphrasing" [Ab]; "I paraphrase what the authors says" [Be]; "I paraphrase rather than copy" [Al]; "I would read it and include the main idea to make clear I'd read it and that the idea came from there, but trying to mix it with my own words" [Al]; "I would cite quotes by the teacher as well and try to reflect too, making comparisons about... I would make a sort of comparison" [Ca]. We can argue that in these cases the appropriation of information is carried out through a cognitive comparison between what is already known and what the new information contributes, as well as through the connection between the two levels by combining the information in a meaningful and conceptual way, gradually turning it into own knowledge. This appropriation process is basically carried out through rewriting, intertextuality and mashups, combining own knowledge with the information of written and audiovisual information that has been searched for, located, selected and retrieved.

As far as dimension 3) Use is concerned, students generally (70%) state that they include references or bibliographies in their tasks, while one of the ten interviewed students cites sources in line with the rules of APA Style. Furthermore, six students (60%) state that they have shared the tasks carried out using the e-portfolio/PLE with their colleagues.

It is also important to take into account the concepts that gradually emerged over the course of the analysis of the interviews. Of these, the most prominent is Reflection, which is associated with the four dimensions, although with a smaller impact on 0) Planning, despite being an important strategic action. This category encompasses reflection on the task and the search for information that must be carried out, reflection on the validity and relevance of the located, selected and retrieved information, reflection on the use and possible sharing of the newly processed, integrated and/or created information, and reflection on the process carried out throughout the task, coinciding with stage seven of Kuhlthau's process (2013).



Graph 4. Emerging concepts associated with Information Competencies

## Conclusions

In relation to showing the development of information competencies facilitated by the use of an e-portfolio understood as a PLE, we have clearly shown the usefulness of including a dimension with different characteristics from those listed in previous classification systems, indicating a comprehensive approach and incorporating decision making about the elements involved in the development of these competencies. In this case, the aim should be to include a more reflective competency capable of simultaneously representing and stimulating the way in which the said categories are approached. In this educational framework, a new dimension clearly emerges, sequentially prior to the existing ones, aimed specifically at information search preparation processes associated with students' planning behaviour.

In addition to the proposal made on information competencies and their classification in the study of the e-portfolio, we broaden the field to include Personal Learning Environments (PLEs), given the evolution and progressive expansion of the portfolio platform used in this case (*Digital Folder*) towards what we have called an "e-portfolio/PLE hybrid environment" (Rodríguez, Rubio, Galván y Barberà, 2014). For this purpose we examine the proposal of Adell and Castañeda (2013), in relation to the components or parts of a PLE (and the strategies and tools associated with each of them) and to the cognitive procedures which, according to Barberà (2005), are involved in the building of portfolios and closely linked to high cognitive level competencies, in particular organisation, self-regulation and metacognition.

Information Competencies, IFLA/GREAV-2.	The elements of the PLE (Castañeda and Adell, 2013: 15-19).	Cognitive procedures in the construction of portfolios (Barberà, 2005: 498)
0) Planning: the user prepares the processes		

involved in the acquisition of information (preparation, specific details of the product, information organisers, etc.).		
<b>1) Access:</b> the user <b>accesses the information</b> effectively and efficiently (searches, locates, <b>observes, analyses</b> , selects, validates, retrieves, etc.).	<b>Read/Access the information. Reading tools and strategies:</b> the <b>information sources</b> I access which provide me with the said information in the form of an object or artefact.	<b>Understanding of the phenomenon</b> ( <b>observation</b> , decoding, <b>analysis</b> and synthesis skills).
<b>2) Evaluation:</b> the user evaluates and processes the information critically and competently (manages, classifies, organises, <b>evaluates, reflects</b> , connects, filters, etc.).	<b>Act/Reflection in action. Reflection tools and strategies:</b> the environments or services in which I can <b>transform information</b> .	<b>Relevant selection</b> ( <b>discrimination and evaluation</b> skills).
<b>3) Use:</b> the user applies the information accurately and creatively (uses, <b>communicates</b> , expresses, creates, <b>shares</b> , disseminates, etc.).	<b>Share/Personal Learning Network (PLN). Engagement strategies and tools:</b> environments in which I <b>engage with</b> other people from/with whom I learn.	<b>Explanatory justification</b> ( <b>writing and reasoning</b> skills).

Table 4. Competencies, Information Competencies, cognitive procedures and e-portfolio/PLE

In the adaptation and extension of the IFLA standards carried out in this research, the PLE components listed by Castañeda and Adell (2013), the cognitive procedures associated with the construction of portfolios highlighted by Barberà (2005) and the parallels shown in Table 4, we can identify four totally parallel and complementary contexts or dimensions in relation to the development and specification of these competencies: the instrumental one; the cognitive and metacognitive one; the social, communicational and ethics-related one; and the emotional and motivational one.

In the adaptation and extension of the IFLA standards carried out in this research (IFLA/GREAV-2), the PLE components listed by Castañeda and Adell (2013), the cognitive procedures associated with the construction of portfolios highlighted by Barberà (2005) and the parallels shown in Table 4, we can identify four complementary aspects or planes that are totally intersected in their development and application: the procedural and instrumental one (dimension 1 of IFLA/GREAV-2); the cognitive and metacognitive one (dimensions 0, 1, 2 and 3); the social, communicational and ethics-related one (dimension 3); and the emotional and motivational one (dimensions 0 and 3).

The development of strategic processes associated with the acquisition of cross-cutting disciplinary knowledge and with the development of the information competency is based, in a balanced and weighted manner, on these four planes or aspects, which are at the same time the basis and context of the associated actions.

We must mention the added interest that these results have for a greater connection between the field of education and that of advanced information literacy. The use of e-portfolios and PLEs in the university environment, still only partially integrated, constitutes a means to visualise and better understand many processes of information practices which take place outside educational institutions and outside libraries, learned reciprocally with friends or through self-learning by trial and error, which on many occasions are opaque to us.

## Notes:

<sup>1</sup> \*We are grateful for the funding provided for this study by Project EDU2012-37897 of the Spanish Ministry of Economy and Competitiveness: "Analysis and improvement of cross-cutting university competencies in an e-portfolio/PLE hybrid environment". We are grateful to Mónica Kaechele and Jorge Miranda, both lecturers at the Universidad Católica de Temuco (Chile), for facilitating data collection.

## Appendix 1

- 1 Do you know the objectives of the tasks?
- 2 Do you know what kind of information (documents, books, concepts, etc.) you need to carry out the tasks?
- 3 Do you select the information you find? With what criteria?
- 4 How do you incorporate the information? Do you copy it? Do you incorporate it in the development of the text? References?
- 5 Do you know how to search for information (apart from Google searches)?
- 6 Have you used the RSS space and social networks? Explain the use.

## Appendix 2

List of the core dimensions (4), categories (6) and subcategories for the analysis of the conducted interviews, in line with the standards proposed by the IFLA on the development of information skills (Lau, 2007), to which we have added a Planning dimension 0 (IFLA/GREAV-2) and some notes (both prior to and during the analysis), which have facilitated the classification process.

### 0. PLANNING

- 0.1. Definition of the product
- 0.2. Information organisers
- 0.3. Work plan

### 1. ACCESS

#### 1.1. Definition and articulation of the need for information. The user:

- 1.1.1. Defines or recognises the need for information;

- 1.1.2. Decides to do something to find the information;
- 1.1.3. Expresses and defines the need for information;
- 1.1.4. Initiates the search process. [Note: pre-selected by the teacher or freely on user's initiative]

**1.2. Location of information. The user:**

- 1.2.1. Identifies and evaluates potential sources of information; [Note: on authors or recognised institutions]
- 1.2.2. Develops search strategies;
- 1.2.3. Accesses the selected information sources;
- 1.2.4. Selects and retrieves the located information.

**2. EVALUATION [Note: Processing]**

**2.1. Evaluation of information. The user:**

- 2.1.1. Analyses, examines and extracts information;
- 2.1.2. Generalises and interprets information;
- 2.1.3. Selects and synthesises information;
- 2.1.4. Evaluates accuracy and relevance of the retrieved information.

**2.2. Organisation of information. The user:**

- 2.2.1. Arranges and classifies information;
- 2.2.2. Groups and organises the retrieved information;
- 2.2.3. Determines which is the best and most useful information.

**3. USE**

**3.1. Use of information. The user:**

- 3.1.1. Finds new ways to communicate, present and use information [Note: expresses, shares...]
- 3.1.2. Applies the retrieved information;
- 3.1.3. Learns or internalises information as personal knowledge;
- 3.1.4. Presents the information product. [Note: disseminates]

**3.2. Communication and ethical use of information. The user:**

- 3.2.1. Understands the ethical use of the information;
- 3.2.2. Respects the legal use of the information;
- 3.2.3. Communicates the product of the information with acknowledgement of intellectual property; [Note: cites correctly]
- 3.2.4. Uses the correct styles for the acknowledgement of the information. [Note: uses (CC)...]

---

**Recommended citation**

Barberà, Elena; Quintana, Jordi; Galván, Cristina; Rodríguez Illera, José Luis (2016). "The e-portfolio as a facilitator of a diversified and reflective information competence". *BiD: textos universitaris de biblioteconomia i documentació*, núm. 36 (juny) . <<http://bid.ub.edu/en/36/barbera.htm>>. DOI: <http://dx.doi.org/10.1344/BiD2016.36.7> [Consulta: 07-07-2016].

**DOI:** <http://dx.doi.org/10.1344/BiD2016.36.7> (<http://dx.doi.org/10.1344/BiD2016.36.7>)