
Closing the “Learning Design Life-Cycle” with the Pedagogical Planner

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Abstract

In the last few years, a number of approaches and tools have been proposed in the Learning Design (LD) research area, with the aim to support teachers in the complex process of conceiving and planning innovative educational activities. Most of the available tools support one or two stages of the whole learning design cycle and this has caused a certain variety of the available tools. Even if some researchers suggest such variety is positive, as teachers are free to pick up from the shell tools depending on the specific needs, others claim that this is too much disorienting, especially for those teachers who are not familiar with the LD field. To contribute to this still open discussion, we have developed a tool, able to cover the whole learning design cycle and have started studying its impact on teachers' LD practices. The paper illustrates such a tool, called Pedagogical Planner (PP), which is able to support the three main phases of the learning design cycle, namely Conceptualization, Authoring and Implementation. The PP so far has been used by teachers to support innovative educational interventions in the field of intangible cultural heritage education and has proved to present a number of advantages and innovative aspects in respect to other existing tools, which are discussed in the paper.

Abstract in Italian

Negli ultimi anni nel settore di ricerca del Learning Design (LD), sono stati proposti diversi metodi e strumenti, con l'obiettivo di supportare i docenti nel complesso compito di ideare e pianificare attività educative innovative. La maggior parte degli strumenti oggi a disposizione supportano una o due fasi del ciclo di vita del learning design e questo causa una certa varietà negli strumenti a disposizione. Mentre alcuni ricercatori vedono tale varietà come positiva, poiché consente ai docenti di scegliere liberamente quali strumenti utilizzare a seconda delle

specifiche esigenze, altri lamentano che questo possa risultare disorientante, specialmente per quei docenti che non sono esperti del learning design. Per contribuire a questa discussione ancora aperta, è stato sviluppato uno strumento, capace di coprire l'intero ciclo di vita del LD, per studiare l'impatto che questo ha sulle pratiche di progettazione dei docenti. L'articolo descrive lo strumento, chiamato Pedagogical Planner (PP), che supporta appunto le tre fasi principali del ciclo di vita del LD, cioè: la Concettualizzazione, la Pianificazione e l'Implementazione. Il PP al momento è stato usato da dei docenti nell'ambito di interventi educativi nel campo del patrimonio culturale intangibile ed ha mostrato una serie di vantaggi rispetto agli strumenti esistenti, che vengono discussi nell'articolo.

Keywords: learning design, intangible cultural heritage, pedagogical planning, conceptualization, authoring, implementation.

Introduction and Background

One of the main aims of the learning design research field (LD) is to provide teachers and educators with methods and tools able to support them in the delicate phases of (re-)designing and planning innovative educational activities. This should address the evident and urgent need of innovating the educational systems. The field has been quite active in the past few decades, with researchers striving to find effective ways to support teachers for the complex task of conceiving teaching and learning activities that can be enacted, shared and repurposed (Conole, 2012; Mor & Craft, 2012; Persico & Pozzi, 2015).

Through the years, researchers have proposed and tested a range of different methods and technological tools, with different aims and with varying degrees of success (Prieto et al., 2013a; Persico et al., 2013): for example, some tools are more oriented to support pedagogical reflection, others are aimed to foster teachers' creativity in conceiving new educational solutions, others are used to make teachers' design knowledge explicit (and thus potentially sharable and reusable), along the whole process of going from design ideas to delivery (Muñoz-Cristóbal et al., 2012; Earp et al., 2013; Pozzi et al., 2015a; Persico & Pozzi, 2015).

Clearly, there is not a unique way for going from teachers' abstract learning design ideas to their delivery with actual students; on the contrary, the learning design process is quite complex in nature, at some stage it is systematic, at others it is creative and in any case it is hardly reducible to a number of predefined steps (Winograd, 1996;

Masterman et al., 2013). This has basically caused the variety of tools that are presently available.

Just to provide some examples, among the tools aimed to support the conceptualization of new activities, we can mention the Course Map (Conole, 2012), the 4SPPIces approach (Pérez-Sanagustín et al., 2012), the 4Ts model (Pozzi & Persico, 2013), Persona Cards (Chacón-Perez et al., 2015), etc. Among the tools aimed to author the design, we can mention WebCollage (Villasclaras-Fernández et al., 2013), CADMOS (Katsamani & Retalis, 2012), OpenGLM, (De Liddo et al., 2011), LAMS (Dalziel, 2003), CeLS (Ronen et al., 2006), etc. A more exhaustive overview of the existing tools, along with a discussion about their main characteristics, can be found in Prieto et al. (2013a). In this same work, the same authors claim the field is too much fragmented.

In front of such variety, some researchers suggest to take advantage of this richness, by using various tools, instead of striving to find one single tool that fits for all purposes (Mor, Craft, & Maina, 2015; Masterman & Manton, 2011). In our recent experience, instead, especially developed within the METIS project (www.metis-project.org) (funded under the LLP Programme), this runs the risk to disorient teachers, especially if they are novice to the LD field.

As opposed to this position, other researchers (Pozzi et al., 2015b) suggest to provide ‘unique, tools’, each one being able to support the whole design life-cycle, starting from the first steps of conceptualizing the design idea (defining the learning objectives, identifying the contents to be addressed and choosing the most adequate pedagogical strategies), down to planning the flow of activities, associating the educational resources and tools to be used by students, and finally delivering the resulting design (being it a single activity or a whole course) to students through a Learning Management System (LMS).

In order to contribute to the LD field, the present paper illustrates a tool, which is called “Pedagogical Planner (PP)” (Bottino et al., 2008). One of the main assets of the PP (and its distinctive feature in respect to all the other tools) is its ability to support – alone – the whole design cycle, in such a way that it allows a smoother and more organic design approach. This makes the PP unique in the LD research field, as it bridges and integrates all the main phases of the design process.

In this paper, one particular instance of the PP is described, as it has been proposed within the i-Treasures project (Ott et al., 2015). The tool has been used by designers of innovative educational interventions in the field of intangible cultural heritage education; after illustrating the tool, the paper provides preliminary data coming from experience of use within the project, thus showing strong points and weaknesses of the PP and paving the way for further work in the field.

Context of the Study

As already mentioned, the instance of the Pedagogical Planner (PP) described in this paper has been proposed and tested within the i-Treasures project (funded under the FP7). The project is about fostering innovation in the field of intangible cultural heritage education, i.e. creating conditions for supporting the “passing down” of rare and traditional artistic expressions (such as traditional dancing, singing, etc.) to new generations through the use of technologies. Thus, i-Treasures represents a genuine novelty in a field where educational practices are usually not yet well consolidated (Ott & Pozzi, 2011) and where technologies definitely represent a disruptive innovation (Ott et al., 2015). An exhaustive description of the project is out of the scope of this paper; here it is enough to underline that in such context, there is obviously a serious need of pedagogical reflections and the learning design phase is essential to make the most of the available cutting-edge technologies, especially because most of them have never been used in these domains (Ott et al., 2015).

Teachers in i-Treasures need to be supported at the different stages of the design process and to reflect on the various elements at play and on the interactions between them, so as to ensure that these form a coherent, manageable whole that responds effectively to learners’ needs – insofar as this can be determined a priori (Jonassen et al., 1997). For this reason, within the project, the Pedagogical Planner has been proposed, with the aim to support the teachers/ designers of pilot teaching/learning experiences in the various intangible cultural heritage domains addressed.

The Pedagogical Planner refers to the Learning Design Life-cycle model, described in Asensio-Pérez et al. (2014) that is based on three main phases: Conceptualization, Authoring and Implementation.

During the Conceptualization phase, educators make a rough design, define the learning objectives to be reached, the contents to be addressed, and consider the target population and the context. As to the Authoring phase, detailed activities are planned and their flow fixed; besides, teachers need to associate to each activity the related

educational resources, etc. As a final stage, during Implementation, courses in a Learning Management System (LMS) are created, according to the design done in the previous phases.

In the following, the paper illustrates how the PP is able to support the three phases of the cycle.

Conceptualizing, Authoring and Delivering with the Pedagogical Planner

In this section, the Pedagogical Planner (PP) is described, as it has been proposed and used within the i-Treasures project.

The PP is a scalable cross-browser web-based application developed in PHP, MySQL and JavaScript. As already mentioned, it is intended to cover the three learning design phases. Consequently, the tool can be conceptually seen as subdivided into three areas:

1. the Conceptualization area;
2. the Authoring area;
3. the Implementation area (which takes the form of the LMS).

In the Conceptualization area (Figure 1), the designer is guided through the definition of a number of aspects, namely:

- the target *Population*: here the designer can reflect and then make it explicit the main characteristic of the population, their age, their pre-requisites (if any), etc.;
- the learning *Context*: here the designer can define the learning situation/environment where the educational intervention will be carried out. In particular, type of context, constraints (if any), timing and setting;
- the *Content domain*: the designer defines the main aim of the intervention and can build a map of the content to be addressed (see Figure 1);
- the *Objectives and Metrics*: here the designer is supported in defining the main learning goals the intervention is meant to reach, plus the criteria to monitor and evaluate the teaching/learning process (during and after the enactment);
- the *Tools*: here the designer can tentatively define the innovative tools and the features s/he is planning to use during the enactment phase with learners.

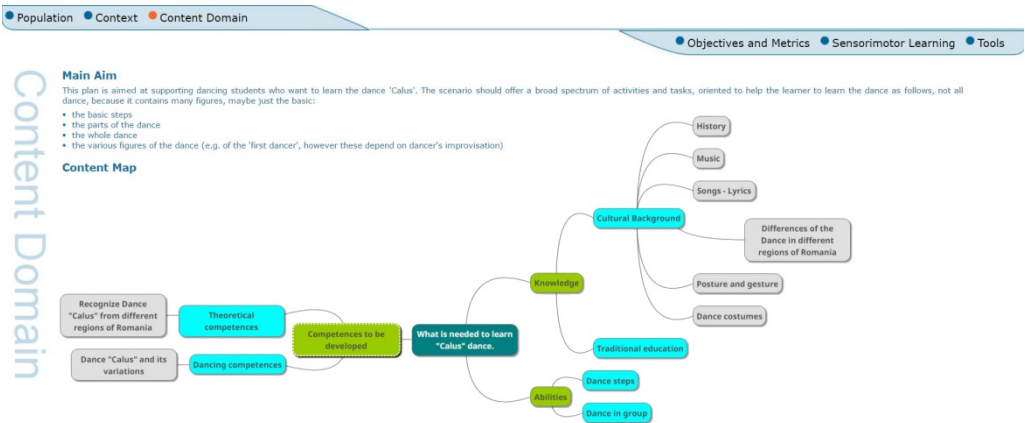


Figure 1. The Conceptualization area – Content map

In the Conceptualization area, textual fields are available, but also content maps can be used (see Figure 1), as this is the most creative stage of the LD process, where these kinds of diagrams might help. In this area of the tool, as in any other area, no field is mandatory and everything can be compiled partially and with no pre-defined order: this is to guarantee a total flexibility to the learning design process, as teachers should be free to use the parts of the tool they mostly need; at the same time, in case the teacher is a novice designer, s/he can follow the suggested structure of the PP, thus being guided in the process.

In the Authoring area of the PP (see Figure 2), the designer is supported in the definition of the activity flow, i.e. the sequence of activities to be proposed to learners (left side of Figure 2), which should then lead them to reach the learning objectives.

Each activity is specified in terms of: Objectives (where specific learning objectives of the single activities are defined); Orchestration (where the required setting is described and the instructions for students are provided); Tools and Resources (educational resources and tools to be used by learners during the enactment phase are provided); Evaluation Criteria (criteria to be adopted in order to evaluate the effectiveness of the activity are defined) (see right side of Figure 2).

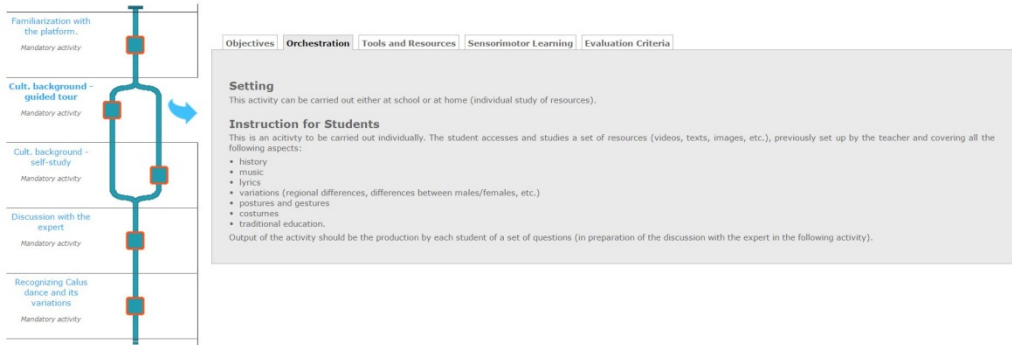







Figure 2. The Authoring area

In the PP, in addition to fashioning a simple step-by-step sequence for (all) learners to follow, the designer can also introduce different kinds of variation and these are represented graphically in the flow chart: authors can designate individual activities as mandatory or optional, and can indicate whether the order in which certain activities are to be tackled will be up to learners. They can also design flows with branching (multiple pathways) in cases where the plan is to include a certain degree of personalization, e.g. by proposing different activities to different learners (or groups of learners) who are ultimately pursuing the same overall learning objectives (see Table 1 containing the main activity options in the PP).

Once the Conceptualization and the Authoring phases are completed, the PP is ready to support the Implementation phase (button “Send to the LMS” in Figure 1), i.e. the automatic configuration of the LMS. In i-Treasures the LMS adopted is Chamilo (<https://chamilo.org>): once the first two design phases are done, all the design knowledge contained in the PP is automatically migrated into Chamilo, where a new course is created, which contains all the basic information about the educational intervention (objectives, contents, etc.), as well as the activity flow, already filled in with the educational resources and tools provided by the designer in the previous phases (see Figure 3).

Table 1: Main activity sequencing options in the PP

Activity sequence options	Representations
<p>Single activity The simplest option. This is to be designated either as mandatory (square symbol) or optional (diamond).</p>	
<p>Ordered sequence of activities Two or more activities that are placed in a sequence, which learners are to carry out in the specified order. There is no limit to the number of activities the designer can add.</p>	
<p>Non-ordered sequence of activities (cloud) The same as above, but in this case no sequencing is imposed. Consequently, learners will be free to choose in what order they wish to tackle these activities. Graphically these are clustered together in a cloud. There is no limit to the number of activities the designer can add.</p>	
<p>Path branching This option allows the designer to split the activity flow into two (or more) separate threads that propose different activities but nevertheless lead towards the same overarching learning objective. Learners will be free to choose which path they wish to take.</p>	
<p>Group branching The same as above, except that the purpose for the branching is to assign specific sub-groups of learners to the respective threads, thus allowing the designer to run differentiated, group-based learning.</p>	

The screenshot shows the Chamilo LMS interface. On the left, a user profile is visible with a 6% progress indicator. Below it, a sidebar menu for the course 'Cultural Background' lists various sections like 'Before you Start', 'Tsamiko', and 'Cultural background - self study'. The main content area is titled 'Tsamiko' and features a lesson 'GREEKS FIRST RELATING TO DANCE'. The lesson text states: 'Greeks since the early years of their history were directly related to dance. Their metaphysical distress was cured by religion, which was manifested by hymns, worship dances and ceremonies. The marriage was accompanied with dance and music and, when life came to its end, the funeral ceremony was accompanied with music and lamentations. From the spontaneous and instinctive need of human for artistic expression, the conscious art of dance was born, expressed mostly by professionals.' Below the text are three images: a classical painting of a dance lesson, an ancient Greek vase, and an Attic red figure kylix. The interface includes navigation buttons for 'PREV' and 'NEXT'.

Figure 3. Implementation in Chamilo (LMS)

From a technical point of view, in order to allow the migration from the PP to the LMS, once the design is ready, an XML is produced. The XML document, conveniently encrypted, is then sent through a POST form to the LMS, which elaborates the request and use the received information to create and properly populate a new course in Chamilo.

Discussion and Conclusions

So far, the PP has been used by the teachers involved in the i-Treasures project, to conceptualize, author and implement pilot innovative interventions in various intangible cultural heritage contexts, and addressing a variety of different populations having different backgrounds, interests and potentialities.

During the experience, we have collected qualitative feedback from the teachers/users, thanks to a continuous dialogue with them during actual use, as well as through final individual interviews. The teachers have been positive regarding both ease of use and usefulness of the PP.

The tool has proven to adequately support the three main phases of the learning design process, thus providing full coverage of the whole learning design cycle. This is an innovative feature in the Technology Enhanced Learning field; even if other tools exist, usually these are able to bridge Authoring and Implementation (i.e. Prieto et al.,

2013a) rather than Conceptualization, and managing the whole cycle within one single tool, remains – to our knowledge – a novelty.

Furthermore, the PP offers other advantages, in respect to the other existing tools: for example, it allows multiple forms of representations of the design knowledge (textual representations, as well as graphical representations, such as the content map and the activity flow); representations in the LD field are one of the most debated topic and allowing multiple representations, is certainly an asset of the PP (Pozzi et al., 2015a), which enhances its flexibility.

Flexibility, which is one of the most advocated requirements for LD tools (Masterman et al., 2013), is also achieved by allowing partial usage of the tool (nothing is mandatory) and allowing to jump from one section to the other. At the same time, if teachers need guidance, they can follow the embedded structure of the tool. From this point of view, the PP can be a good candidate in teacher training contexts, where teachers often need to be supported in re-designing and/or re-planning their traditional teaching/learning activities.

Regarding the Conceptualization function, the PP embeds a ‘neutral’ pedagogical approach, i.e. it can be used to design any activity, independently on the intended pedagogical models behind it; it thus well fits the need for differentiating educational interventions, by offering not only a variety of different contents, but also by envisaging the adoption of different educational approaches, strategies and methods. This “neutral” approach is different from the one adopted by other tools, such as for example the 4Ts (Pozzi & Persico, 2013) or the 4SPPIces (Pérez-Sanagustín et al., 2012), which are exclusively intended to support the design of collaborative or problem-based learning activities respectively.

Furthermore, the PP has proved to be particularly easy to use, which is one of the most critical aspects often raised by teachers in similar experiences. For example, it has been recognized that the tool does not require any particular technological skills from the teacher to manage both the Authoring, as well as the Implementation phase, which in other tools are far more complex and require high digital skills.

The ability of the tool to support the design of learning paths together with their “multiple variations” to accommodate differences in the target population needs, has clearly emerged from the initial testing in the field of cultural heritage and suggests

that the PP can be seen as a suitable tool for fostering personalization of learning interventions (Meyer et al., 2006).

Regarding the present drawback of the tool, we must acknowledge that the LMS used in i-Treasures for Implementation (i.e. Chamilo) is very user-friendly, but for sure this is not the most popular LMS and this makes the PP not very much transferrable to other contexts, at least as far as Implementation is concerned. Nonetheless, this experience has proven the feasibility of the approach and it is already in the developers' plans to develop the Implementation functions using other LMS (such as for example Moodle). As a matter of fact, experimentations in this direction have already started and other data will be soon made available to the scientific community.

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