COMPETENCE-ORIENTED COURSE DESIGN AND MONITORING: THE APPROACH OF ERASMUS PLUS PROJECT "BETTER E-LEARNING FOR ALL"

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FULL PAPER

ARGOMENTI: Competence-Based Course Design, E-Learning Retention Factors, Pedagogical Decision Support

Abstract

Erasmus Plus Project *Better e-Learning for All* aims at contributing to the reduction of the gap between the potential value of E-learning and the quality of design of online courses. Departing from research findings in dropout, motivation and retention factors, a conceptual approach to course design was developed and applied to the Better-e MOODLE environment. Better-e platform is designed to support teachers and trainers to overcome uncertainties about pedagogical choices, providing a Competence-oriented decision support environment and a selection of platform features customized to provide easiness of use, to support self-regulation, and to reduce the risks of incurring in common errors of course design that could have a negative impact on retention.

Keywords – E-learning, Competence, Learning Design, Retention, Pedagogy

1 INTRODUCTION

This case study presents and discusses the E-learning development dimensions that are addressed by the Erasmus Plus Project *Better e-Learning for All* (2015-1-TR01-KA204-021954), from now on referred as *Better-e*, which has among its goals the design of a pedagogical platform to facilitate the creation of e-learning courses by teachers and trainers in the field of adult education.

Despite the growing consensus about the potential value of E-learning to add flexibility to learning paths and promote social inclusion, the low perceived levels of self-efficacy remains a key concern in the design of courses and management of online classrooms. E-trainers beliefs about their capabilities to produce qualitative levels of performance can exercise influence over their choices in course design or in adopting innovative methodologies because "People avoid activities and situations they believe exceed their coping capabilities" (Brandura, 1994). Oversimplification of online course design through exclusively content-centered environments is reported to be connected, when resulting from choices of their authors, to their coping strategies instead of analysis of desired learning outcomes. However, the pragmatic results are frequently: the impoverishment of learning processes, and the consequent decrease in retention rates, due to the lack of interactivity and social engagement (Sun et al., 2008; Wang, 2003; Arbaugh & Duray, 2002; Thurmond, et al., 2002).

Project *Better e-learning For All* aims at contributing to the reduction of this gap between the potential value of E-learning and the quality of design of courses that are designed by teachers or trainers without full support of instructional designers. The present work illustrates the conceptual results applied to working samples implemented with the adoption of the Open-source learning environment MOODLE enhanced by a Pedagogical Decision Support self-guided activity.

2 SPECIFICITY OF *BETTER-E* APPROACH

The first international meetings of Better-E partners were dedicated mainly to the fine-tuning of the approaches that could guide the development of solutions coherent with e-learning in the field of Adult Education, and, at the same time, could be adopted by teachers and trainers providing a high degree of autonomy and low dependency on external resources. The group of *Better-e* partners is composed of 8 organizations with strong experience in Adult Education and E-learning form 5 different countries: Turkey, Portugal, Italy, Greece and United Kingdom.

The expertise shared by the partners indicated that there is a general improvement among practitioners and learners in terms of ICT competencies in Europe but it does not apply to all kinds of profiles of learners, especially among disadvantaged and older groups. On the other side, there is a shared concern about the risks of confounding transversal ICT capabilities with online Teaching and Learning capabilities. A third issue, addressed by the partners discussion, regards the acknowledgement that competence-based curriculum and course design recommendations are pervasive in European Policies (European Commission, 2011). In E-learning courses, however it is scarcely adopted. The major portion of the e-learning courses, according to the experiences shared, still consists of content e-publishing and readings.

The resulting *Better-E* approach to the development of the tools to support teachers and trainers in their e-learning projects and classroom management can be represented by 3 intertwined dimensions:

1. Support competence-oriented course development to promote coherence between soundly stated learning outcomes and the learning processes enacted;
2. Overcome barriers to both access and learning self-regulation by adoption of self-explanatory interfaces and appropriate representation of monitoring and tracking information;
3. Reduce the risk of common errors in e-learning design, by adoption of an interactive structured process of analysis which incorporates tips and optional contextual theoretical references, in order to reduce uncertainty at decisional level and thus maximize the “comfort-zone” of teachers and trainers.

3 RESEARCH ACTIONS THAT INFORM THE BETTER-E APPROACH

Other than the shared experience of the partners, the development of the e-learning environment and the decision support tool were also informed by the results of 2 research actions that investigated:

1. The impact of course design features on reducing dropout rates in e-learning;
2. Competence and motivational reasons perceived by students as drivers for dropping out;

3.1 The impact of course design features on reducing dropout rates in e-learning

The preliminary report about the state of the art in the recent literature about E-learning adopted as methodological approach the Systematic Review, which allows to synthesize the findings of several studies investigating the same questions (Gough, Oliver, & Thomas, 2012). We expected to obtain new inputs on the relationship between well-defined course design factors and dropout prevention as a response to the research question: “What’s the relationship between course design with attrition and dropouts in e-learning?”.

The research was limited to peer-reviewed scientific papers published since 2011 in English, excluding publications about massive online courses (MOOC). After the initial retrieval of 1826 references from scientific databases and 5 references suggested by experts, the title and abstract review reduced the collection of full papers to 35 publications that were finally assessed by 3 researchers. The final selection of publications was surprisingly small because of the heterogeneity of contexts, disciplines, goals and methods adopted by each study. Only 7 researches provided some discussion about relationships between Dropout factors and Course design factors.

The analysis of the content of the selected papers was coded following the categorization model designed by Lee and Jaeho (2011) in their review of empiric studies from 1999 to 2009. In that framework, “course design factors” comprehend the subcategories: course design, institutional support and interactions; “student factors” are: academic background, psychological attributes, relevant

(previous) experiences and (previous) personal and learning skills; “environmental factors” are distributed in 2 broad subcategories: supportive environments and work commitments.

The main lesson learned from the Systematic review was the profound interconnection between “course design factors”, related to interactivity, and psychological attributes and skills (student factors) such as: time management, self-regulation, and confidence in using technology. However, it was not possible to produce a meaningful shortlist of recommendations for design that could be generalized.

3.2 Competence and motivational reasons perceived by students as drivers for dropping out

Factors that influence persistence in e-learning courses were further investigated through a quantitative survey. The invitations to respond to the survey were distributed through the channels of the Universities partner of *Better-e* in Italy, Turkey and Portugal, reaching a total number of respondents of 208 adult e-learners.

The focus of the online questionnaire was on the motivational factors studied by Gonzales (2015) and students’ satisfaction studied by Sun & all (2008). Demographic data was analyzed with descriptive methods such as frequency and percentages. Correlations among factors were calculated adopting Pearson correlation coefficient, while for the comparison of two variables the preferred method was the one sample T-test.

Among the findings of the research, some meaningful correlation values indicate that, in the groups of respondents studied, the following factors have positive correlation with retention and motivation: learner attitude toward computers; learner self-efficacy; instructor response timeliness. Perceived course quality and technology quality, perceived usefulness and perceived ease of use have also positive and meaningful correlation with retention and motivation.

4 BETTER-E E-LEARNING DECISION SUPPORT TOOL

The Better-e e-learning environment was initially conceptualized as a flexible environment where the choices of setup could be designed by the teacher or the trainer with the support of an embedded automatized decision support tool. Wizard systems, for example, are based on a series of “known diagnostic options”, gradually excluded by the user, followed by a collection of possible solutions.

Working on a paper prototype, however, the designers found a highly relevant limit to this approach, since it would require the assumption of direct correlations, universally accepted, between intended learning outcomes and the efficacy of available learning tools. In fact, there is no universal standard that guarantees goal achieving simply by means of technology adoption. From a pedagogical point of view, instead, it is extremely relevant the accuracy of the problem setting, considering a wider range of variables that will allow the definition of the required learning processes to achieve the intended goal. Tools and resources can be considered thus enablers of learning processes but the appropriateness of choices derives from a coherent intentional modelling of their use by the purposed learning activities.

Following these path of reasoning the concept prototype was totally redesigned in order to provide support to the problem setting stage of course design, with a focus on the coherence between stated learning outcomes and the definition of learning processes. Instead of an automatized system of filters and recommendations, the new paper prototype adopted a recursive method of iterative revisions of statements for the analysis of desired learning outcomes, availability of resources, constraints. The decision support process presents progressively a set of variables to be considered in order to both fine tune the outcome statements and their connected learning processes.

The working prototype was developed after the approval of the general categories of analysis discussed by all partners and successively optimized through the testing of a simplified working prototype as a structured form in Goggle Forms platform (https://docs.google.com/forms/d/1Urkk9KMTowDPueJSaHN8srQ-ZJ0PiwqNFkk8mFpxFP8/viewform?edit_requested=true). The most challenging aspect of the revisions was the choice of pedagogical expressions used in the interface. Comprehension of some key concepts of pedagogy is necessary to obtain an effective result during analysis. Beta-tests of comprehension of requests and guidelines, simulating the interactions with real cases were carried on by the trainers of the partners institutions, both experts and non-experts in e-learning. Each one of the doubts produced the revision of the texts and concepts used in the interface, that was further reviewed by a proof-reader in English.

Some of the non-expert reviewers suggested the need for contextualized further readings, embedded in each Step, in order to allow teachers and trainers to solve their more theoretical doubts and overcome the need of external support. This feature was incorporated in the final version of the tool.

The groups of decisional factors are organized according to the following steps:

1. Defining framework references for competencies
2. Scenario analysis
3. Stating learning outcomes
4. Planning learning processes
5. Checklist of reminders for fine-tuning the hypothesis of learning activities

The final version of the environment was implemented in Better-e E-learning Platform, as a pedagogical self-standing Decision Support activity based upon the MOODLE plugin *Questionnaire* (https://moodle.org/plugins/mod_questionnaire). The plugin was chosen, among other plugins available in the Open Source repository, due to the possibility of dealing with:

1. Time management: all partial activities are saved. The author can organize dedicated time in multiple sessions.
2. Storage and retrieval: it is possible to modify inputs and projects previously saved.
3. Navigation: intuitive navigation can be organized by steps.
4. Integration: final projects can be setup to be automatically shared for approval or requests of feedback.

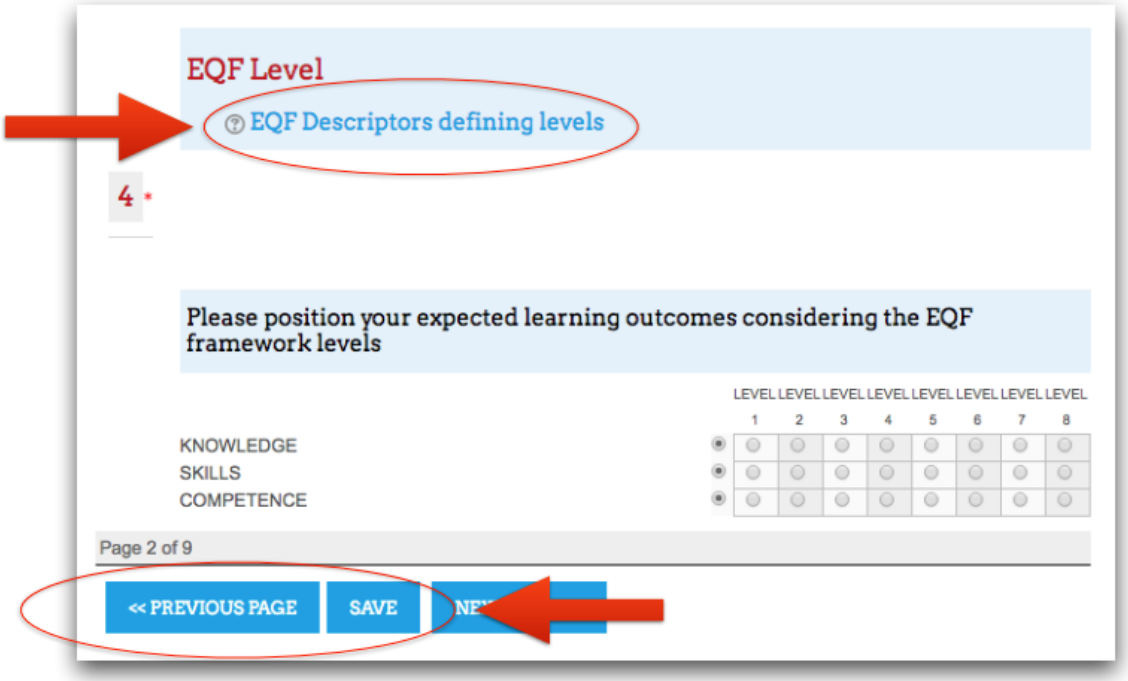

Figure 1 – Beter-e user friendly interface

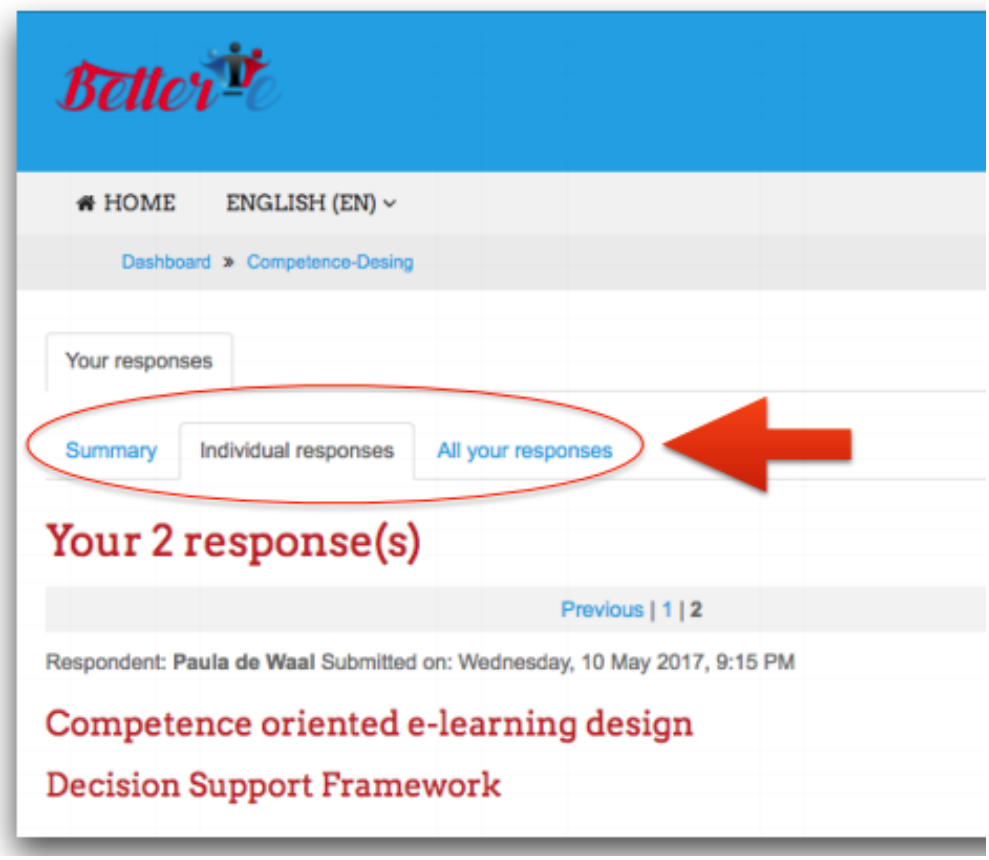

Figure 2 – Personal archives of projects with automatic saving functionalities

The decision support tool was adopted in the development of 2 courses by Better-e Partners and further analyzed by a panel of 5 experts, and a group of 7 beginners enrolled in an e-learning training course.

The feedback of the authors engaged in Better-e courses design confirmed that their experience of adoption of the tool was aligned with their following expectations:

1. Reduction of uncertainty about pedagogical choices (expanding the comfort zone)
2. Reduction of the risk of oversimplification (recursive path to problem setting)

All users ascertained that the tool is a useful environment if adopted early, as the first step of analysis. Beginners, however, perceived the analysis process (in simulation mode) as excessively time-consuming. Further investigation is recommended to verify if this feedback is related to the lack of previous experience in instructional design or if the tool mechanics needs optimization with the goal of reducing the time spent in navigation and/or manipulation.

5 OPTIONAL PLATFORM FEATURES

Decisions about learning design processes are normally included in the sphere of actions of teachers and trainers since it represents the strategic and organizational dimensions of teaching. The implementation of monitoring and feedback systems in platforms, instead, is rarely a decision at course level, since it has an impact on the entire platform adopted and its affordances.

Some of the factors relevant to retention and motivation described above are highly dependent on choices that are made by implementation teams and could be available to teachers and trainers. That is the case for monitoring reports and dashboards but also for the management and association of competency frameworks with courses, learning plans and activities. If an organization chooses to enable the Competence Based Education features in MOODLE platforms, an extra layer of course design will be required to map each activity and resource to the relevant item of the Competency Frameworks adopted at course or program level. This could require specialized instructional design support and implementation by technical assistants.

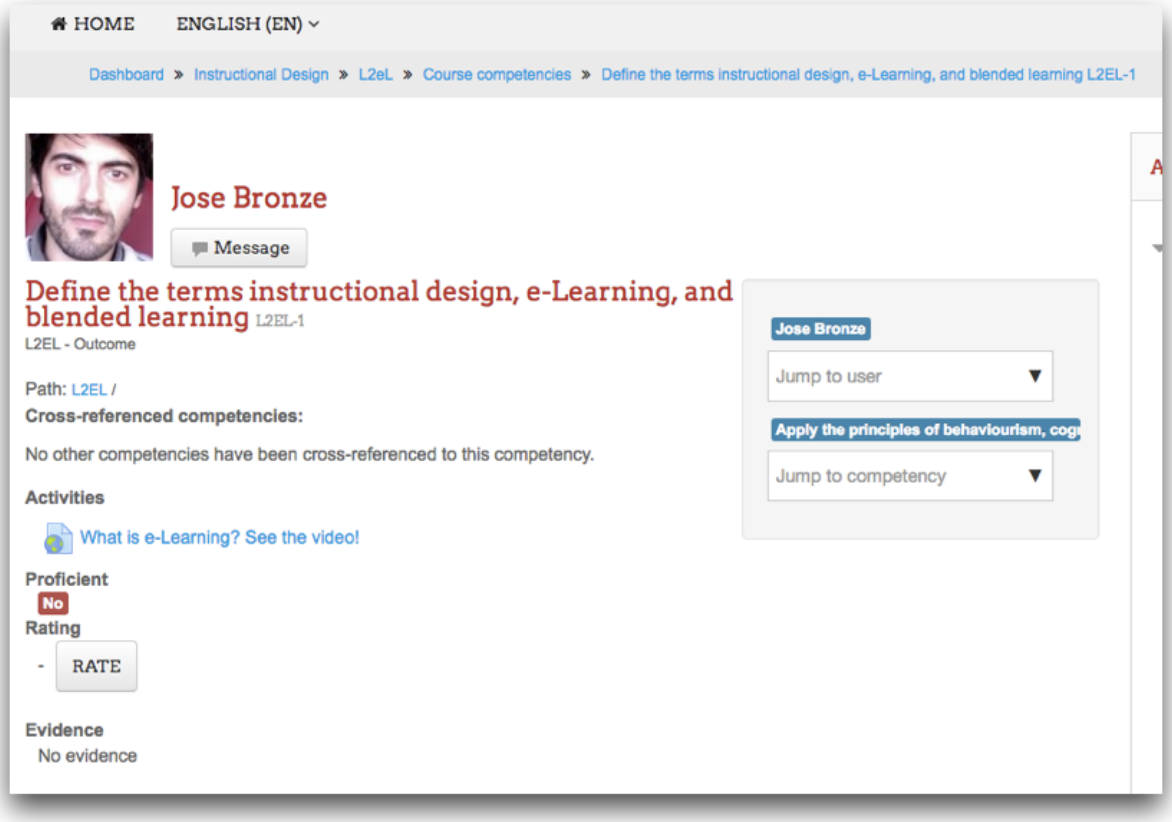

Figure 3 – Evidence of learning outcomes mapped to activities and competency frameworks

There are other valid plugins, already available also in Better-e platform, useful to improve monitoring of interaction, status of completion and time management. These plugins are specifically designed to support, through dashboards and/or alerts in their “quests” for timeliness and self-regulation. The 2 courses developed by E-better partners adopted the following additional plugins that provide quick visualizations of data gathered by the tracking system:

1. Completion Progress: Color-coded quick reference block visualized both on courses and dashboard pages. Activities are represented with a time management goal, indicating their status of completion (https://moodle.org/plugins/block_completion_progress).
2. Course Module Navigation: Interactive table of content generator that adds a green bullet to the completed activities (https://moodle.org/plugins/block_course_modulenavigation).

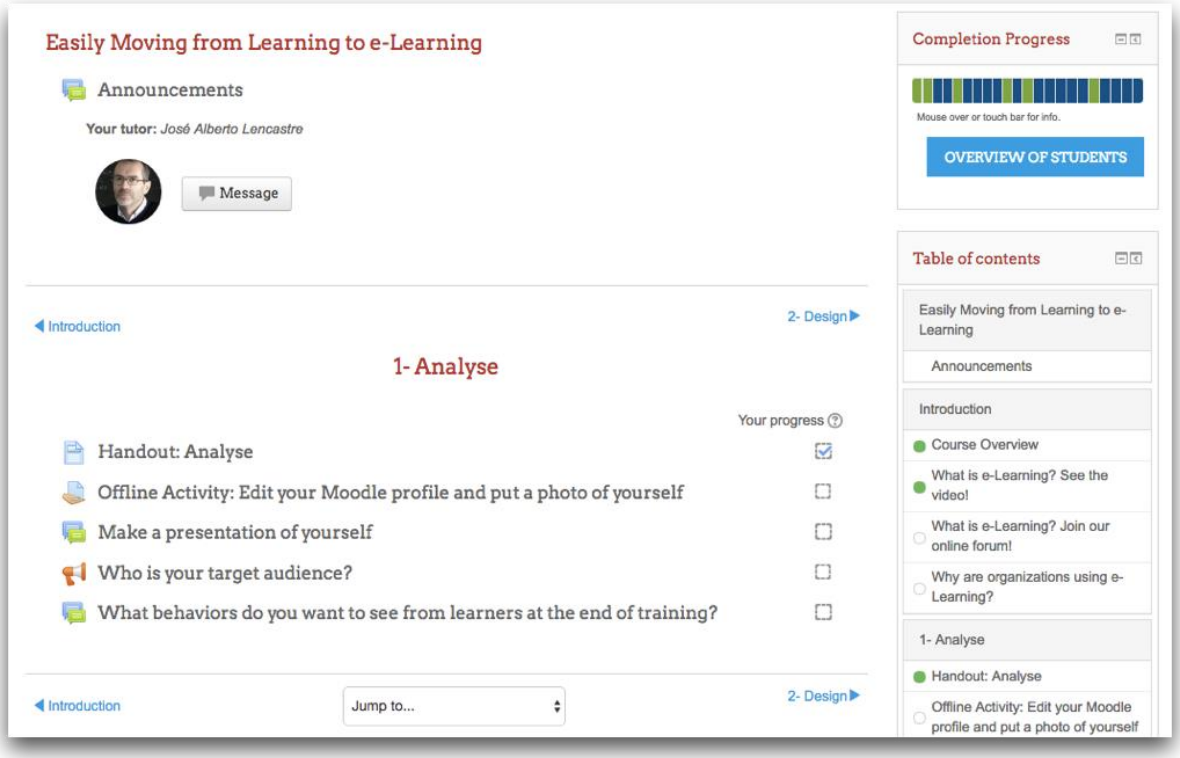

Figure 4 – Easy to use interface in courses developed by Better-e project present learning units in separate pages aiming to improve visualization in all kinds of viewers, including tablets and smartphones. Each resource is setup with completion criteria so that progress can be tracked and visualized by teachers, trainers and students.

6 CONCLUDING REMARKS

Learning design requires coherence in balancing learning outcomes and online learning activities. Coherence is the principle that enables educational effectiveness in all educational settings. However, teachers and trainers can perceive the design and orchestration of meaningful e-Learning activities and events as ill-structured problems with too many indefinable variables. Better-e platform is designed to support teachers and trainers to overcome these uncertainties about pedagogical choices providing a Competence-oriented decision support environment and a selection of platform features customized in order to provide easiness of use, to support self-regulation, and to reduce the risks of incurring in common errors of course design and management that could have a negative impact on retention.

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