Errata-Corrige: Laia Albó and Davinia Hernández-Leo
Co-creating a web-based visual representation model for authoring blended learning designs - Appendix
Interaction Design and Architecture(s) Journal - IxD&A, N.42, 2019, pp. 227 - 231

Appendix

Table 1 Participants' demographics: gender, age, teaching experience and teaching subjects.

		School #1 (N=11)		School #2 (N=13)		Both (N =24)	
		N	%	N	%	N	%
Gender	Female	7	64	9	69	16	67
	Male	4	36	4	31	8	33
Age	20-34	3	27	2	22	5	25
	35-44	4	36	1	11	5	25
	45-54	4	36	6	67	10	50
Teaching experience	5 or fewer	2	18	0	0	2	9
	6-10	4	36	2	18	6	27
	11-15	2	18	1	9	3	14
	16-20	1	9	2	18	3	14
	21-25	0	0	4	36	4	18
	> 25	2	18	2	18	4	18
Teaching subjects	Arts/Music	0	0	1	14	1	5
	Language	0	0	1	14	1	5
	Foreign Language	0	0	1	14	1	5
	Social stud. /History	1	9	2	29	3	15
	Maths	0	0	1	14	1	5
	Science	5	45	2	29	7	35
	Other	5	45	1	14	6	30

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Interaction Design and Architecture(s) Journal - IxD&A, N.42, 2019, pp. 227 - 231

Table 2 Difficulties found during the design process in the development workshops 1 as well as their related improvements to consider. Results extracted from the questionnaire responses (n=14).

#	Topics	Frequency Sch.#1	Sch.#2	Excerpts from the research questionnaire	Improvement ID
1	Slow edition (activities & tasks)	4	1	"I have progressed very little since I have to constantly repeat aspects that in my case are constant…" (U1-7) "…when creating an activity on a specific day, the duration of the activity by default is 1 day, so you always have to change the day and the end time of the activity" (U1-8) "Lack of flexibility in some aspects, to copy tasks, add links to tasks, etc." (U1-8) "The tasks could not be copied, dragged or changed." (U1-3) "be able to repeat the activities of the classes" (U2-3)	Imp1, Imp2, Imp3
2	Timeline management	1	1	"It's a bit difficult to move around the timeline. You have to invest too much time in deciding which day, and at what times, each task must be done." (U1-9) "mark the calendar and the days of school holidays for control the work sessions" (U2-3)	Imp4, Imp5
3	Tool inputs & outputs	2	0	"You cannot download a summary document of the design." (U1-3) "You cannot upload already prepared documents to associate them with a task." (U1-3)	Imp6, Imp7
4	Activities' types visualization awareness	0	2	"I find it difficult to visualize when I am working with the work in the classroom and at home…" (U2-2) "…know where you are in the line of work (school / house)" (U2-3)	Imp8, Imp 9
5	Designs representation	1	0	"It does not give the possibility to indicate that an activity is done with a group of groups" (U1-9)	Imp10
6	Goals edition	0	1	"I found that the goals could not be edited…" (U2-4)	Imp11
7	Web navigator	0	1	"… did not go well with the safari browser." (U2-4)	Imp12
8	Saving work	0	1	"go back without erasing" (U2-3)	Imp13, Imp14

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Interaction Design and Architecture(s) Journal - IxD&A, N.42, 2019, pp. 227 - 231

Table 3 Main strengths of the web-based prototype (versions 0 and 0.1). Indicating the main topics extracted from the qualitative analysis (VR: visual representation; O/P: organization and planning; R/A: reflection and awareness; S/G: support and guidance).

#	Excerpts from the Q1-2 question's answers	VR	O/P	R/A	S/G
1	The sequencing of all phases of the learning process. (U1-5)	x			
2	Easy to collect any idea and reflect it in a design material. (U1-2)	x		x	
3	It allows you to have a lot of information about each designed activity. It gives a complete and accurate view of the activities. It helps and guidesduring the design. (UD1)	x			x
4	Make the teachers aware of the objectives of the activities and also the way in which they will carry them out in class. (U1-10)		x	x	
5	The degree of specification of the different activities throughout the design and the incorporation of tools to support this design. (U1-6)	x			
6	Leave a pretty complete record, with the most important points of PBL. It is easily registered the grouping of students, the tasks to be performed, etc. (U1-8)	x			
7	It allows you to structure the sessions very well and design them by carrying out a very necessary reflective process. (U1-3)		x	x	
8	It is all collected in one place only and helps you plan all sessions without forgetting any information. (U1-9)		x	x	
9	The possibility of planning in a very visual way. (U2-1)	x	x		
10	The possibility of systematically guiding and organizing teaching-learning activities. (U2-2)		x		x
11	the general view at a glance, the control of time and activities inside and outside the classroom, the possibility of having the tools / activities resources, the teacher's performance, … (U2-3)	x			x
12	It is an application that facilitates the organization of activities inside and outside the classroom to make FC. (U2-4)		x		
13	The previous organization and the obligatory organization. (U2-5)		x		
14	It allows to order and clarify the whole process avoiding improvisations. (U2-6)		x	x	
	Total frequencies	**8**	**8**	**4**	**3**
	Total percentages	**35**	**35**	**17**	**13**

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Interaction Design and Architecture(s) Journal - IxD&A, N.42, 2019, pp. 227 - 231

Table 4 Main weaknesses of the web-based prototype (versions 0 and 0.1). Indicating the main topics extracted from the qualitative analysis (TdL: tool's development limitations; HtI: High time investment; NoS: Need of support; Ep: Educational polices).

#	Excerpts from the Q1-3 question's answers	TdL	HtI	NoS	Ep
1	The calendar of the tasks. (U1-1)	x			
2	A bit difficult do it without receiving support, I think it will cost me to do it alone. (U1-10)			x	
3	Apart from the difficulties mentioned above, perhaps a very high investment of planning time. (U1-8)	x	x		
4	If the PBL is long, you have to devote much time to designing all the sessions. However, and as always, it is work that we can take advantage of for other courses. (U1-3)		x		
5	Those mentioned in question 1. (U1-9)	x			
6	It is not connected to other tools that may be of more everyday use, such as Google Calendar or other types of notices that can reach students more directly. It also gives a lot of work and it will be necessary to see if it compensates in practice. (U2-1)	x	x		
7	I do not know yet, but what is an advantage (systematization) can be an inconvenience (bureaucratization). (U2-2)				x
8	I think it's a tool that can be very powerful if you fix the little details. (U2-4)	x			
9	I think that the options already set have to be better configured. For example, when defining a session, it would be good to define them by default of 60 or 55 minutes. (U2-5)	x			
	Total frequencies	**6**	**3**	**1**	**1**
	Total percentages	**55**	**27**	**9**	**9**

Table 5 Direct suggestions from the participants to improve the tool collected from the research questionnaire.

#	Topics	Excerpts from the research questionnaire	Improvement ID
1	Platform config.	Maybe add direct links to ILDE to go from one place to another. (U1-1)	Out of scope
		Do not have to remember more of a user and a password. (U1-5)	
2	Tool inputs and outputs	It would be positive that the tool itself could be used in class. ... there was a "class mode" that allowed displaying links, extracting explanations that could be projected, integrating applications and centralizing the results. (U1-8)	Imp16
		Be able to download a summary document of the design. (U1-3)	Imp 6
		Generate a document with all the information presented. (U1-2)	
		Upload documents already elaborated to associate them with a task. (U1-3)	Imp 7
3	Timeline management	Improve viewing of activities in the timeline to better understand in which point I am in the design, activities done, and activities I have pending. (U1-6)	Imp17
		It would be nice to see all PBL sessions on a single screen (such as PBL's planning for sessions at a glance only). (U1-9)	Imp18
4	Tool inter-operability	Be able to connect the design with our Google account or ClickEdu, to the forms of organization that we already have integrated. (U2-1)	Imp19
		Security copy to a compatible document with other formats. (U1-2)	
5	Slow edition (activities)	Be able to copy the tasks and / or sessions. (U1-3)	Imp 1, Imp3
		Would like to copy the activities (U1-2)	
		That you can copy / paste session designs. (U1-7)	
		Be able to drag or change tasks in order. (U1-3)	Imp20
		The possibility of changing if an activity is done at home or in the classroom once edited. (U2-5)	Imp21

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Table 6 Improvements to consider. Indicating their source (Q: questionnaires 1 and 2; FG: focus groups; I: interviews, O: observations), the state (i: implemented; ni: not implemented) and the version readiness (tool's version in which the improvement has been implemented).

ID	Description of the improvement to consider	Source	State	Version readiness
Imp1	Repetitive activities creation needs to be optimized.	Q, FG, I, O	i	0.3 (duplicate activities)
Imp2	Allow to configure pre-setting of the activities (i.e. time duration) and tasks.	Q, FG	i	0.4
Imp3	Allow to duplicate tasks (within an activity and between activities).	Q	ni	-
Imp4	Timeline improvements Import/export calendar (VLE, online calendar…).	Q, FG, I	ni	-
Imp5	Import holidays from an external calendar.	Q	ni	-
Imp6	Allow to generate and download a summary document about the design (syllabus).	Q, FG	i	1.0
Imp7	Allow to upload documents attached to a certain task within an activity.	Q	i	0.3
Imp8	Indicate better the type of activity when they are editing (icons).	Q, O	i	0.2
Imp 9	Highlight in a more effective way the activity selected on the timeline (which the user is editing it on a specific moment).	Q	i	0.2
Imp10	'Dynamic groups' category in the students' type of task descriptor.	Q	ni	-
Imp11	Add the possibility of editing the objectives once they have created.	Q, O	i	0.3
Imp12	Only works in Chrome. Extend for other browsers.	Q, O	ni	-
Imp13	Automatically save the changes user has done in the editor.	Q, O	i	1.0
Imp14	Undo (Ctrl + Z) and Redo editing commands.	Q, O	ni	-
Imp15	Instantiate an LDshake platform only for the authoring tool.	Q	i	1.0
Imp16	Class mode interactive visualization	Q, FG	ni	-
Imp17	Allow users to mark/visualize on the timeline which sessions have been already done.	Q	ni	-
Imp18	Provide a 'all-sessions' view on the timeline (hiding the time between the sessions).	Q, FG	i	0.2
Imp19	Connect with the VLE/platforms being used by the institution.	Q	ni	-
Imp20	Be able to change the order of the tasks within an activity, once they have created.	Q, FG	ni	-
Imp21	The possibility of changing if an activity is done at home or in the classroom once edited.	Q	ni	-
Imp22	Automatic tab selection in visualizing the graphs whereas users are editing.	Q	i	0.2
Imp23	Video tutorials as well as pop-up tips and messages embedded in the editor for providing help during the edition.	Q	i	1.0
Imp24	Community analytics.	Q, FG, I	i	1.0
Imp25	Add titles of the activities in the timeline/or visualization.	FG	i	0.4
Imp26	Editor's sections flexible display (hide-show buttons).	FG	i	0.3
Imp 27	Improve the flexibility of the activities changes on the timeline.	I	ni	-
Imp 28	To be able to add a flexible time range for the out-of-class activities.	O	ni	-