Visualized Learning Design: The Challenges of transferring an innovation in the Cyprus educational system

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The adoption of a new Learning Design methodology, especially when it is related to Information and Communication Technologies (ICT), by teachers in Cyprus is a challenge. This paper describes and evaluates the process of transferring such a Learning Design innovation, as developed by the UK Open University, to elementary and secondary education teachers in Cyprus context, its impact on their practice, as well as barriers obstructing the transfer. Lastly, suggestions for future implementation are given in the conclusion's part.

Keywords: Visualized Learning Design, transfer of innovation, explicit and collaboration, Learning Design methodology, Information and Communication Technology

Introduction – Learning Design

Learning design is perhaps the most important step of the learning process. A successful lesson is often associated with an effective learning design (Richards, 1998). Thus, educational researchers always seek to develop effective learning design techniques to assist teachers in creating effective lessons. (see Goodyear and Retalis, 2010). Literature on this subject (see, for example, Agostinho, 2006 and Conole, 2008) refers to Learning Design (LD) both as a product and as a process. Specifically, LD is a *product* or artefact in which learning activities are being documented in a way to enable other teachers to understand and implement them in another context (Agostinho, 2006). LD is also considered to be the *process* that teachers go through, in order to develop their lessons, design learning activities and reform existing lesson plans (Conole, 2008; Masterman, 2008 and Donald et al., 2009). Donald et al. (2009) argue that viewing LD only as a product is a rather misleading perception which leads to failure in transferring and sharing common LD practices amongst educators. They move on to explain their argument by stating that teachers cannot just isolate a LD disregarding the audience (i.e. students), the resources, the designer and the context which is designed to be implemented in. Given the rapid digitalization of media, teachers are now encouraged to share their lesson plans and designs with other teachers through online communities and Communities of Practice (CoP) (Wegner, 1998). Thus, inevitably the question arises: how can LDs be transferred and shared amongst practitioners *successfully?*

Sharing good practice amongst teachers has become a necessity (Donald et al., 2009). However, LD is a process and a product which is formed and affected by teachers' prepositions, conceptions and pedagogical beliefs. The heterogeneity of teachers' background seems to obstruct effective sharing. (Velada et al., 2007). Therefore, research supports that there is a need to shift from implicit and personal beliefs towards explicit and design-based procedures, in order to facilitate sharing (Galley et al., 2010). Additionally, Waters & Gibbons (2004), Conole et al. (2008) and Agostinho (2008), focus on the need to use a common language when referring to LD, both as a product and as a process. This necessity emerged from the results of their research and it appears that teachers who want to share their LDs have to have something more in common, apart from their common profession as educators. Thus, many research projects such as LAMS, RELOAD and JISC were designed to develop common languages, tools and media in order to assist the designers' work and facilitate their sharing. The above emerged teacher needs initiated the project "Open University Learning Design Initiative" (OU LDI) by the Open University of the UK. This project has mainly two objectives: first, to capture and represent design practice through case studies and support LD process and second, to facilitate communication and sharing amongst teachers by developing tools that will assist the representation and sharing of their LDs (Brasher et al., 2008). This paper will focus on the latter initiative. Therefore, a more detailed description of the tools and procedures of this project ought to be presented now.

The OU LDI team developed a Visualized Learning Design (VLD) methodology using visualized LD tools in order to facilitate teacher design procedures, sharing, collaboration and evaluation of LDs, covering designs of short activities up to designs on a Curriculum level. The OU LDI team argues that VLD results to better communication between teachers and stimulates more challenges and issues to discuss while designing (Conole et al., 2008). Designers, who follow the OU LDI VLD procedure, go through three levels of design: macro level, meso level and micro level (Conole et al., 2008). According to the team, macro-level (Course Map View) is the level where teachers/designers discuss their initial rough ideas and get into a general discussion of their LD, similar to a Curriculum design. The meso level (Learning Outcomes View) is the second stage of the VLD methodology where teachers/designers group and refer to their LD's activities and explicitly set the learning outcomes and expected outputs of their LDs. Lastly, the third stage of the VLD methodology, the micro-level, is the more detailed level which includes specific tools, resources, methodologies and roles for each activity. Nevertheless, the levels described above are not isolated. Even though designers proceed from macro level to micro level, this procedure is more like a cycle rather than a linear path. Since LDs often need to be refined and redesigned, designers can move backwards and forwards through the levels according to their needs.

In order to develop the above levels, the OU LDI team developed tools, in respect to two important project parameters: the visualization and the sharing of the LDs. Thus, they created CompendiumLD (http://compendiumld.open.ac.uk)which is a visualization mapping tool and Cloudworks (http://cloudworks.ac.uk) , which is a networking website where users can find, share and discuss LDs and other pedagogical issues (Galley et al., 2010).

Leonardo da Vinci – Transfer of Innovation – Cyprus case

The Cyprus Pedagogical Institute (CPI) participated in a European teachers' training project (01/10/2009 – 29/09/2011) "Design Practice" under the Leonardo da Vinci – Transfer of Innovation program (http://www.design-practice.org). This project aimed at transferring expertise and innovation amongst the projects' partners. The transfer of innovation to teachers through in-service training workshops is a challenge because for the past three decades a great number of teachers show resistance to ideological and pedagogical change (Rodriguez, 2005; Hargreaves, 2005). In Cyprus, teachers rarely change their pedagogical ideologies and beliefs even after attending training programs (see Vrasidas and McIsaac, 2001). In order to help teachers to integrate ICT in their lessons, the Cyprus Pedagogical Institute (CPI) has trained 50 Primary education and 50 Secondary education teachers to be Trainer/Coaches (TCs) in their own school units, as from 2009. TCs main aim is to provide assistance to teachers in their school units who want to integrate ICT in their lessons. For the purposes of this project, the OU LDI VLD methodology and tools were transferred in the Cyprus' context. This transfer was conducted in three phases through workshops and TCs were employed as part of the transfer process.

During the first phase, the OU LDI team transferred the VLD methodology to members of the project partners and officers of the Cyprus Pedagogical Institute (CPI), in a workshop held in Cyprus with31 participants. In a second phase the CPI offered two seminars, in which 2 trainers transferred this methodology to 58 TCs of Primary and Secondary Education. For the third phase of the implementation, the CPI research team (authors) selected 10 TCs who had participated in the VLD workshops and asked them to transfer the VLD methodology to fellow teachers in their school unit as part of the CPI research. Eventually, 5 out of those 10 TCs expressed interest to participate in the research. These TCs attended a 4-hour follow-up workshop during which they applied the VLD approach in order to develop a lesson design for the implementation of the transfer of the VLD approach to school teachers in their school unit. They were also given printed supporting material as well as access to a Moodle module specifically designed to support this transfer (http://elearn.pi.ac.cy). Eventually, 18 school teachers were trained by the TCs.

Through the second and third phases, the CPI research team wanted to observe the transfer of the VLD methodology from the CPI to TCs and then from TCs to teachers and also evaluate the impact of the VLD methodology on teachers' practice. In this project, TCs were trained by the CPI to transfer the VLD approach to teachers in their school units and therefore the trainees were to become trainers. Thus, it was important to be able to transfer both knowledge and skills that they had acquired during their original training by the CPI. The current paper aims to report the major findings in respect to the success of the transfer and the way the VLD methodology affected participants' collaboration and design practice. For

the purposes of this paper the results from Phases 2 and 3 are to be discussed, in order to answer the following two research questions:

1. To what extent was the transfer of this methodology successful during the last two phases?
2. How does the adaptation of this VLD methodology affect the collaboration and design practice of the implicated teachers in Cyprus?

Methodology and data collection

Participants

The selection of the initial 10 participants in the third phase was done by using convenience sampling (Cohen et al., 2011). Nonetheless, participants had to fulfil the following criteria: to have participated in workshops and be familiar with the methodology, to come from schools located in different cities of Cyprus and to establish representation from both sexes and to be interested in participating. The following table (table 1) presents the participants of the third phase in more detail.

Table 1: Third Phase Participants

Teacher – Trainer/Coach	Teaching level	School teachers	City
TC1	Primary	2	Nicosia
TC2	Primary	2	Nicosia
TC3	Primary	5	Limassol
TC4	Primary	1	Limassol
TC5	Secondary	8 (A:2 / B:3 / C:3)	Limassol

Participants' Activity

TCs were asked to select teachers from their school unit, develop collaboratively a visualized learning design using the OU LDI methodology and tools and then implement their designs in a classroom. TCs were asked to follow the 7 activities described in table 2 in order to transfer the VLD methodology. These activities were the same activities used during Phases 1 and 2 workshops, but TCs had the flexibility to change the content of those activities according to their trainees' specific needs. The activities that participants went through are described in the following table 2:

Table 2: Participants' Activity

	Activity	Objectives
1.	Introduction to Learning Design (OU LDI)	To introduce Learning Design and the methodology of OU LDI
2.	How to ruin a lesson with ICT	To identify and manage risks that occur when using ICT in the classroom
3.	Interaction with 4 web2.0 tools	To identify and discuss affordances, limitations and added value of ICT tools
4.	CourseMapView	Macro level (OU LDI tool)
5.	Learning Outcomes View	Meso level (OU LDI tool) where learning outcomes, activities and learning outputs are aligned
6.	Activity View	Micro level where details regarding the design are discussed
7.	Implementation	Implementation and Reflection

In order to guide and support TCs, the CPI provided them with the following material: 1. a booklet (in Greek) with background information on the Learning Design and instructions for applying the methodology, 2. the presentation used by the CPI for their training, 3. Suggested macro, meso and micro levels of a VLD developed by the CPI researchers, 4. templates of Course Map View (macro) and the Learning Outcomes View (meso) in A3 papers, 5. a proposed timeline for their implementation,

6.notation guide and stickers of CompendiumLD in case school teachers were not familiar with technology and therefore could not interact with CompendiumLD during implementation. In addition, CPI created a course in the CPI Moodle environment (http://elearn.pi.ac.cy), where the TCs and their school teachers could download electronic copies of the printed material, find links to more information about the project, use the dictionary created by the CPI researchers to understand terminologies and communicate with other TC groups through forums and post questions. Support was given through personal and telephone contact, e-mails between TCs and the CPI team and Moodle forums.

Methodology

Data collection tools

Due to the nature of the research questions nature, data were collected using both qualitative and quantitative procedures (Taskakorri & Teddlie, 2003). The 5 groups of TCs and school teachers were different (Table 1), therefore they were treated as 5 individual Case Studies (Yin, 2003). Two CPI researchers (authors) were responsible for designing and monitoring data collection procedures. Data were collected via observations, semi-structured group interviews, questionnaire and through copies of the groups' Learning Designs (artefacts). Statistics were also derived from Moodle in order to have a descriptive account of participants' logins and contributions to the online communities. Additionally, TCs were asked to complete a reflective diary of each meeting right after it was held, in order to get their view of each meeting to compare it with the researchers' observation reports. Furthermore, the artefacts from groups' Learning Designs were also collected and analysed both during and at the end of the process. Lastly, reflective diaries were also recorded, after each classroom implementation.

The results reported in this paper derived mostly from data collected through the researchers' observations of groups' activities and the semi-structured group interviews conducted right after groups had gone through all the activities (TC1 group did not have time for classroom implementation). The questions of the semi-structured group interviews were designed in order to gain more insight to what each group did. Also, through the interviews the researchers had the opportunity to identify and clarify misconceptions and answer further questions regarding the VLD methodology. The group interviews were audio taped and then transcribed in great detail.

Researchers' roles

The two CPI researchers were present in almost all the TCs meetings with their teachers, being observers as participants in order to gain an insight to the groups' activities (Patton, 2002). This was done under participants' consent agreement. It was pre-decided that researchers would not intervene with the groups' work. Nevertheless, there were a few times where they had to intervene in order to resolve questions or to correct misconceptions that the TCs or the school teachers had. After each observation, researchers completed a pre-designed observation protocol separately in order to record their notes and reflections regarding the observation.

Data Analysis

Data from questionnaires were analyzed in Moodle using descriptive statistics of each question mean. Due to the small number of the questionnaires, SPSS or any other statistical package were not appropriate. Data from the semi-structured interviews were firstly transcribed in full detail and then were open coded (Strauss and Corbin, 1998) and categorized using nVivo software. Open codes resulting from all interviews were then grouped in order to answer the research questions. CPI's researchers analyzed TC1 Group interview independently and then compared their individual Open Codes to establish internal validity of the coding procedure (Cohen et al., 2011). CPI's observation reports and LD artifacts were used to enhance meanings of participants' activity.

Results and findings

The results and findings of the study are divided in three subsections; Success in transferring the methodology, barriers obstructing the transfer of the methodology and influence on TCs and teachers' collaboration and design practice.

Success in transferring the VLD methodology

Overall, we consider the transfer of this methodology to be successful, considering the fact that by the end of the project, all participants stated that they had understood the VLD approach and philosophy. However, we do not consider the transfer of this methodology *by* the TCs as trainers as completely

successful. This is because only two out of the five TCs managed to transfer the methodology without the CPI intervention. In our discussion we will elaborate on the role and understanding of TCs, the experiential and collaborative nature of the workshops and the visualized nature of the VLD tools.

TCs role and understanding
Even though TCs claimed to have understood the methodology by the end of the second phase, data indicate that in fact there were only two out of five groups (TC4 and TC5) which seemed to have understood the methodology without the CPI intervention. This appears to be as a result of TCs' understanding.TC4 and TC5 admitted that they began to understand the methodology after having read the material posted in Moodle, in their own time. Also, TC5 prepared an LD of her own because she wanted to go through the VLD levels before transferring it to her colleagues. TC1 and TC3 seemed detached while transferring the methodology (Researchers' observation diaries) which indicates that they did not comprehend their role in the transfer process. However, only TC1 explicitly admitted to Researcher 2 that: *"I learnt (the methodology) in the process, along with them (the teachers), there were things I didn't know"* (TC1 – Group interview). In one case where TC2 did not adequately understand the methodology, this had an impact on teachers' understanding as well. TC2 group admitted during the group interview that they had not completely understood the methodology but *"now (after Researcher 1 explained the methodology again) we understand it better"* (TC2 – group interview). During group interviews, all TCs stated that they felt insecure in transferring the methodology to other teachers because at the beginning they did not feel that they understood it well enough. Some of them admitted that it was after transferring it to teachers that they felt that they actually understood the VLD methodology (for example, TC2 and TC4).It was obvious from our implementation that TCs needed more time to acquire the VLD methodology in order to feel confident enough to transfer it to other teachers in the third phase. Perhaps this was one of the reasons why 3/5 TCs failed to transfer the LD approach without CPI's interventions.

Experiential and collaborative nature of workshops
Almost all participants stated that they enjoyed the fact that they worked collaboratively in groups to prepare their lessons and that they discussed and exchanged ideas with other teachers. All participants considered the experiential nature of the workshop very important and stated that if the workshop was in a form of a lecture they would not have participated in the training. The groups stated working on A3 structured papers for designing their lessons helpful because they had something common to work on for a common cause. One of them (TC4) mentioned that she particularly liked the fact that she and her fellow teacher were working on a big paper which was scaffolding their LD process, for example Course Map View and Learning outcomes View. Additionally, some of the teachers underlined the importance of designing a lesson that they were all interested in. One teacher in TC5's group, who seemed detached from the training workshop, admitted that this was because the subject of their group's VLD was not her area of practice.

VLD tools and Moodle course
Participants considered the CPI guidance and support to be sufficient. TCs found important and valuable the content of the Moodle course which assisted them when they needed references and reminders of the training process. Almost all participants appreciated the visualized nature of the VLD tools, highlighting particularly the meso and micro levels as the most helpful. According to both TCs and teachers, the mapping, visualization and horizontal alignment of their VLD's components helped them develop a clearer, more organized and more analytical VLD. Specifically, participants stated that the VLD methodology helped them because: *"It was more analytical. It makes you see the lesson in more depth, looking it from different angles and points of view"* (TC5 - Group interview). Another teacher in TC5 group interview stated that: *"The columns (meso view) were very helpful for me... we specified the objectives, what we want to do [...] because I am a bit disorganized, this helped me"*. In fact, all VLD classroom implementations were successful and were implemented according to plan. In one case, (TC3) not all activities were eventually done but the teacher admitted that this was a decision which she took consciously and more easily because she had the VLD (product) in front of her at the time she was teaching. The teacher who implemented the particular lesson that the TC3 group developed said that: *"Everything gets in order and they get in order in your mind as well. We do it a bit in our minds but it is not as clear"*. Even though almost all participants stated that they found the VLD tools time-consuming and a bit confusing (Course Map) at the beginning, they eventually recognized that they were helpful. A teacher in TC1 group stated: *"It connects each component with a result... it doesn't allow the teacher to*

make an error, because he knows that I want this medium, this source to do this activity, which fulfils this objective. I have everything there, I organize them from before and my chances of success are increased with this way" (TC1 – Group interview).

It seems that all participants appreciated the experiential and collaborative nature of the workshops as very important during their VLD process. Most participants valued the visualized nature of the VLD methodology's tools despite the time-consuming factor. Nevertheless, there were a few participants who viewed this methodology resembling procedures that they already follow while designing a lesson and claimed that the mapping is something they do in their minds. However, we believe that there were other factors obstructing the transfer and participants' acceptance of methodology.

Barriers obstructing the transfer of the VLD methodology

As mentioned earlier, Cypriot teachers show resistance to change. According to findings from a research regarding transfer of training, conducted by Velada et al. (2007, p.291) it is suggested that *"transfer of training is impacted by the training design, characteristics of the trainee and contextual factors"*. The results of this project indicate that there were barriers obstructing the transfer of the VLD methodology related to the training design, participants' beliefs and prepositions and Cyprus' context, which will be discussed next.

The training design and contextual factors
Training was designed by the CPI in order to ensure that the content of training activities would be the same throughout the Phases for all the participants. Thus, very few changes were made to the original training OU LDI team conducted in Cyprus during Phase 1. The CPI researchers went through the activities three times and TCs twice. After all, TCs were expected to be fully trained through their role as designers and also as trainers. However, 3 out of 5 TCs failed to transfer the content of the methodology to their teachers without CPI's interventions. Most TCs failed to distinguish Activities 2 and 3 (Table 2) as activities for ICT integration which aimed to train teachers with less or no experience with ICT. For example, only TC4 managed to explicitly relate Activity 2 to its objective. In addition, 3 out of 5 TCs (TC1, TC2 and TC3) implemented Activity 3 by demonstrating the web 2.0 tools instead of hands-on activity. Thus, teachers did not have the chance to explore the affordances of the web 2.0 tools on their own. Also, even though CPI gave TCs the opportunity to change the web 2.0 tools according to their teachers' needs, they all used those specific 4 tools to train them. Two of the 4 tools did not support Greek language and therefore teachers seemed reluctant in exploring them further. That was another indication of TCs failure to explicitly relate those activities to their objectives. We believe that the weakness in transferring Activities 2 and 3 successfully on behalf of the TCs was due to two reasons; Firstly, the training content and activities were pre-designed by CPI. During the follow-up training in Phase 2, TCs designed a vague training VLD without considering their teachers' needs and the context in which the training was to be implemented. It seems that they did not have enough time to fully explore and assimilate with the activities, even though the reminder training seemed to be successful at that time. Secondly, TCs were experienced in using ICT and had already gone through the activities. Therefore, they did not explicitly explain to their teachers the aim of each Activity during Phase 3 training workshops.

Characteristics of the trainees and teachers' beliefs
In several cases, teachers seemed to be hesitant adopting a new design methodology. From the observations of researchers and the discussions groups, it appears that teachers and TCs already follow a specific method to design their lessons that stems from their personal beliefs and teaching experiences. It seems that former methodologies were preventing some of them to appreciate and adopt new methodologies. For instance, TC2 group case is an example of personal and pedagogical beliefs hampering the acceptance of new methodologies. TC2 was the TC who appeared to have the most misconceptions regarding the VLD content and the training procedure she needed to follow as a TC. Even though she communicated with the CPI researchers asking for guidance, she did not appear to be particularly receptive of the clarifications and explanations given to her. In fact, during her group meetings she was disorienting rather than coordinating the training. TC2's lack of understanding resulted to weak transfer of the VLD methodology to the teachers and teachers' frustration while using it, especially when using Course Map View (macro level tool). Both TC2 and one of the two teachers of her group showed strong resistance in adopting this methodology and continuously referred to their traditional methods of designing a lesson. This is something Group A of TC5 groups similarly expressed.

The two teachers of that group argued that since their subject (Chemistry) involves experiments, the way they teach is more or less the same. Whilst they seemed positive and enthusiastic in adopting this methodology, the teacher of that group who implemented the lesson supported that the way she is used to design her lesson is the "correct" design method for her subject. Given that the rest of the TC5 groups seemed to have understood the methodology before the final group interview, we believe that the resistance this group demonstrated derived from other, more implicit factors, such as their personal prepositions and pedagogical beliefs. This reinforces Donald et al.'s (2009) argument of the necessity to focus on each teacher's prepositions and beliefs, because they affect the way they design and reuse designs for their own teaching practice.

VLD methodology's impact on participants

This methodology appeared to have an impact on TCs and teachers that got involved with it. This impact was twofold: impact due to VLD tools' visualized nature (product) and impact due to explicit collaboration and interaction while designing (process). Teachers were working collaboratively, discussing their VLD using common tools and a common base of understanding. The dialogic nature of the LD process helped participants establish that they were talking about the same thin. For example, in TC5 Group C discussion, TC5 stated that: *"This helped my team to better understand what each of us meant in some occasions. In many incidences, while aurally talking about something and thinking that we were talking about the same thing, indeed when we put it down on paper we discovered that we actually meant different things"*. During LD design, TCs and teachers said that they considered important components that they would have otherwise ignored, such as the teacher's role within the classroom while students are working collaboratively. They stated that their discourse while designing was helpful and that they discussed ideas, from which they selected the best for their design. VLD components were mapped, visualized and aligned horizontally. This mapping and visualization influenced their design process and the implementation of their design products while teaching. Even though there were teachers who considered this methodology time-consuming and seemed resistant during the transfer, they all appreciated the dialogic nature of their collaborative VLD. When participants described the way they are used to discuss and share their practice, most of them referred to a mere exchange of material without explaining the rationale behind the design. As a teacher in TC1group explained: *"viewing someone else's project you don't know how he worked to get there, what the objective is, for what lesson is for and of which subjects. This (VLD) is different. Is more specific, more guided, it is easier to explain to someone else, what you have designed"*. All participants mentioned that one of the strongest elements of this methodology was the way they collaborated. Even though they did not all explicitly connect this collaboration to the visualized nature of the tools of this methodology, it was implied by their activity while designing that these common tools assisted and enhanced their discussion and sharing. TC4 explicitly stated that: *"I felt that it had an impact on me, on the way I think. I included other issues along with the ones I usually have whenever I design something [...] and because this procedure took weeks to be completed, I saw that it had an impact on me [...] for example challenges. I never thought of challenges, I only thought of the objective"*

Conclusions
Teachers appreciated the role of their TCs as essential and valuable. Even though there were weaknesses identified while TCs were transferring this methodology, perhaps more support and guidance on behalf of the CPI in future implementations might resolve that issue. Overall, it seems that teachers appreciated the VLD training process that they went through, for three main reasons: first, they realized that by making their VLD decisions explicit helped them reflecting on their practice and second, second, they valued the visualized nature of the VLD product of their discussions using tools that scaffold their designs and third, they understood the value of sharing and interacting with other professionals as a process to reach to sound pedagogical decisions. It seems that the participants admitted to have understood the methodology better after going through the whole training process and they commented that they liked this sort of training approach. They also claimed that a second or third implementation of the VLD methodology will make it easier to follow and less time consuming. However, despite VLD acknowledged value, it appears that most of them are not ready to adopt such a process in their everyday practice because it is a time-consuming process which they do not need to go through because of their teaching experience. In some cases teachers did not realize the difference of the VLD methodology claiming that they have been going through a similar process "in their minds" without recording it down on paper. Moreover, they claimed that they were "unconsciously" considering different aspects while designing a lesson because

for them is like an automated process derived from the years of experience. Thus, further study investigating the way teachers' personal beliefs and attitudes as well as professional practice and experience influence the implementation of the VLD initiative, is needed. Lastly, this VLD methodology, as suggested by participants, can be used to train all teachers in Cyprus and especially the ones related to the development of learning designs for the new curriculum being released this year.

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