

Multimedia Educational Pills (MEPs) for corporate training

Methodology and cases

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Abstract

This paper describes the Multimedia Educational Pills (MEPs) model. MEPs are highly concentrated courses, designed to address a topic through multiple representations, following a recursive, non-cumulative, logic, as pointed out by the Cognitive Flexibility Theory (CFT) methodology.

MEPs have been designed to meet the educational challenges posed by the transition from an industrial to an information age. They focus on promoting the capacity to deal with uncertainties and solve problems in an adaptive way.

Variety is the key to the architecture and the main benefit of applying MEPS. In fact, MEPS are made up of multiple resources. Each learning object has its own particular shape, perspective and conceptual dimension. In addition, the MEPS are designed to be used in multiple ways, such as e-learning, classroom, blended learning, and to be accessible on multiple devices. MEPs can support multiple teaching strategies (such as self-training, cooperative learning) and multiple learning architectures. In particular MEPs - used before or as follow-up - can integrate and improve

traditional classrooms. Finally MEPs can be used in support of coaching paths or in support of outdoor training paths.

Multimedia Educational Pills; E-learning; Soft Skills; Visual Thinking; Cognitive Flexibility Theory; Blended Learning; Multimedia Learning; Corporate Training

I. INTRODUCTION TO THEORETICAL BACKGROUND AND METHODOLOGY

The transition from the industrial to the information age had led to deep social, economic and cultural changes [1]. In particular, said changes have led businesses and workers to challenge consolidated organizational models and strategies to face the emergence of new needs and skills [2].

Organizations and individuals operate in increasingly complex and ill-structured environments, where traditional approaches, based on knowledge simplification and standardization of procedures, show significant limits: rejection of cognitive complexity (ignoring the originality and complex nature of phenomena) and oversimplification (assigning a value of truth to partial representations) leads to transfer errors (persistently applying obsolete codes to new

situations) that cause failures in problem solving and cognitive blocks (not recognizing the failures and persevering in error) [3].

We need other ways to challenge complexity. In addition to technical and domain-specific skills, organizations should also, and especially, promote strategic skills, such as cognitive flexibility, which is “the ability to spontaneously restructure one’s knowledge, in many ways, in adaptive response to radically changing situational demands” and the ability to build knowledge ensemble from multiple sources, to address emerging situations and solve problems in an adaptive way [4].

This leads to a new conception of educational systems, which can go beyond directive models, focused on compartmentalized, linear, single-prospective, hierarchical, simply analogical and rigidly prepackaged cognitive organizations.

The Cognitive Flexibility Theory (CFT), developed by Rand J. Spiro and colleagues, supports a particular methodology, well represented by the criss-cross landscape metaphor, taken from Wittgenstein. This consists in crossing and recrossing the same knowledge domain in a non-linear and multidimensional manner, returning to the same place in the “conceptual landscape” several times and from different directions [5].

From the educational point of view, this means providing learning environments with multiple and varied resources and designing recursive fruition logics; so that the same subject can be represented by multiple rather than single representations, each of which with its own form, perspective and conceptual dimension.

Resources must be highly interconnected, so that the user is led to pass from one to another, following personal processes of construction and serendipitous learning, and returns to the already received with new awareness, driven by further goals and interests [6].

The application of CFT methodological recommendations, in particular aspects related to the criss-cross landscape concept, is one of the main characteristics of the model described in this article, called Multimedia Educational Pills (MEPs). MEPs are highly concentrated courses, designed to address a topic through a variety of representations, and based on a recursive, non-cumulative, logic.

Each MEPs resource - fiction, cartoons, tutorials, games, art and reading stimuli, techniques of self-improvement, etc. - is not designed to add new information to what has already been provided, but rather to revisit the topic with a different language and from a different perspective. In addition, the learner goes through, during his educational experience, different instructional dimensions, such as experience-based learning, convergent and divergent thinking, metacognition and self-improvement.

Moreover MEPS resources are aimed at involving participants in discursive interaction. In particular, fiction and cartoons can stimulate participant identification and initiate a debate, which starts from personal experiences. As participants are going through the different phases of discursive negotiation, they develop analytic, cognitive and

linguistic skills, enhancing conceptual change [7]. Learning advances through collaborative interaction and the circulation of narratives [8]. Forms of discourse become forms of thinking [9].

According to this perspective, MEPs resources can facilitate the development of virtual professional communities [10, 11], enhancing knowledge creation and sharing, cooperative learning, sensemaking and identification processes [12].

II. MULTIMEDIA EDUCATIONAL PILLS (MEPS)

Multimedia Educational Pills shape knowledge and introduce concepts to the learner by an innovative way. Pills permit the creation of main constructivism theories: learners can shape a unique learning process, in accordance with their training needs.

MEPs structure highlights main concepts (about soft skills or technical competencies) through different channels. Thanks to its hypertext structure, this model has many levels such as principle menu, covers, screen text and in-depth PDFs. The learner can proceed in a personal way, to achieve his/her learning objectives.

The exclusive MEPs format approaches contents in a complete, rigorous manner. The language of each Learning Object is simple, synthetic, visual, friendly. These are the main Learning Objects:

- Intro – the guiding character introduces the contents Pill. A nice picture intrigues learners.
- Post it skills – an interactive self-assessment activity. The learner identifies his/her strengths and improvement areas.
- Cartoon or fiction – real situations contextualize contents.
- Tutorial – a speech summarizes core competencies, key words appear into the screen (about 3 minutes running time).
- Game, Art, Literature – edutainment components sharpen lateral thinking, stimulate reflection, favour different points of view.
- Technique - card with practical hints.
- Book – all contents of the Pill in a PDF file.

Learning Objects can be used freely. The MEP menu suggests a logical order, but learners can play objects by their favorite way. Each object is complete and independent, even if an absolute connection still subsists.

The tutorial represents the Pill’s primary object. In fact it contains core competencies and useful tips. Thanks to visual strength of images and key work appearing in the screen window, the tutorial captures the learner’s attention and promotes content memorization. With the passing of time, the design of this object becomes valuable: the trend is to amplify images and interconnections. Textual parts only have a description role. Today the tutorial rises thanks to a specific project, following Visual Thinking guidelines [13].

“In fact – as we all know – Visual Thinking isn’t “new” at all. It’s the oldest problem-solving toolkit of all, predating

verbal communications in the evolutionary chain by eons, and leaving us as Kindergartners the ability to explore and explain our ideas long before we could read and write.” [14]

In addition, MEPs learning time is shorter than traditional training, but the didactic value is high. The MEP objective is to approach a training subject in a complete way, thanks to boosts and links that promote personal reflection and start proactive processes for continuous development. The vital needs of adults are protection of self-esteem. Participation and motivation increase when self-image is not denied and when people can choose an autonomous career [15].

In short, MEPs methodology features are:

- Light, friendly communication;
- short time fruition;
- focus on basic contents (low cognitive load);
- emotional participation to cross psychological barriers, typical of training adults.

These are the main advantages:

- links to real experience, through the use of cartoons and fiction showing concrete situations;
- reflection on personal experience and development of new points of view, through the use of edutainment objects (game, art and literature);
- self-awareness and personal development, through the use of post it skills, technique, and close examination.

III. PRACTICAL USE/APPLICATIONS

The instructional model of MEPs makes them flexible and suited to several methods of use, in which the roles of trainer and learner differ according to the case in question (whether it is more or less active).

1) *Just in e-learning* (Web Based Training - WBT): MEPs are basic learning tools in online courses; in this case the role of trainer is absent. MEPs are consulted in self-training through the Learning Management System (LMS) or the company intranet. MEPs are SCORM compatible and can be traced in the platform.

2) *Just in classroom*: trainer can use the multimedia resources of MEPs to support the traditional teaching method, to make it more experiential and concret.

3) *Blended learning* (face to face and e-learning): MEPs can also be used in mixed training; for example, to make a part of the pill (or the complete pill) available online before teaching in the classroom (pre-work) to standardize the level of knowledge of the subject and address the face to face lesson from a knowledge of the same; or to make the complete pill available online after classes as follow-up in the learning process and to review the concepts discussed in class.

MEPs can also be accessed by multiple devices: pc, notebook, interactive whiteboard, ipad, iPhone, blackberry and other mobile devices.

Just in e-learning MEPs can be used:

a) *In self-training*, following a program agreed with the trainer, for example after the assessment interview with a supervisor.

b) *In cooperative learning*: small MEPS study groups can be programmed, the ideal is from 2 to a maximum of 5 components, of specific content areas.

c) In interactive online environments, where assistance is provided by tutors, using chat rooms, forum, email and other interactive tools.

In classroom the trainer can use several Multimedia Learning Objects of the MEPs, to alternate classical training sessions (mostly theoretical) in a balanced way with greater learner involvement [16].

For example, the fiction is particularly suitable for use in the classroom. The trainer can show the movie to learners and engage them through analysis and understanding of the situation described in the movie; through experience-based learning and discussion.

The tutorial too, one of the most theoretical learning objects of the pill, explains the fundamental theoretical concepts of the subject in a few minutes. The trainer can use the tutorial to introduce the topics to be explored during the lesson, or can show the tutorial at the end of the lesson as synthesis or summary.

The trainer can use games and art during lessons, to stimulate reflection and links related to topics.

The technique, another operative resource of the pill, can be used as a starting point for creating small groups and practice.

In blended learning, the MEPs can be used:

a) *to integrate traditional classroom*, stimulating new learning processes, mixing pre-work, face to face lesson and post-work. MEPs are all assigned before the *face to face* lesson, in this way the lessons are shorter and experiential, or the MEPs are assigned progressively: a part as pre-work, a part during lesson, and the complete pill at the end, as post-work. Or simply the MEPs replace all teaching materials, given to learners to study and revise course topics.

b) *In support of the coaching paths*. The coaching paths can be enhanced and enriched through MEPs.

c) *In support of outdoor training paths*. In particular topics related to team building and self-development.

The MEPs are flexible in content: can be designed both for behavioral training (soft skills) and technical training (procedures, laws, technical topics).

IV. CASE HISTORIES

According to the learning design methodology described above, the MEPS can be combined in several blended paths.

A. *Blended and on the job*

One example is the “Knowledge Experience” project organized during March-October 2010 in the second Italian banking group. The project - addressed to managers (700 people) - was focused on the issues of innovation and initiative. The course consisted in two steps: *blended* phase and *on the job* phase. The blended phase provided face-to-face sessions (introductory seminars, classroom courses and training workshops) and online training. The MEPS - available in the intranet - were introduced at the beginning of the path, as a “warm up” step.

The on the job phase involved use of the MyProjectWork® application that guides participants in the formulation of a personal improvement project. Moreover, since the beginning of the project is made available to all participants myBookshelf®, a shared interactive library. At the end of the course participants selected one of the proposed workshops - 3 hours mini training events - in which the trainer was accompanied by experts from sports, culture, science, and arts. The project provided a complex learning architecture to scaffold learning and conceptual change.

B. On line pre-work and face to face training

Another example of a blended learning project involved one of the main Chilean telecommunications companies and concerned technical skills.

The course, addressed to Company's employees, was aimed at improving employee knowledge of Company products and services (mobile phone technology, personal computers and laptops, technological applications), trends and innovation in the telecommunications market, Company strategy to meet market needs.

The course consisted in on line training and face-to-face training sessions.

The MEPs, available in the intranet, were used in self-training as pre-work and introduction to the face-to-face sessions.

Moreover during the face-to-face sessions trainers used MEPs to stimulate discussion among participants and support their lesson.

Pill success and efficacy in this project was related to the use of a friendly, simple and mainly visual language to communicate technical contents.

C. Web Based Training

Beyond blended training solutions, another use of this methodology is Web Based Training. People can use the pills directly from a website (www.skilla.com) or from their own company's Intranet or e-learning platform where the products have been uploaded. These courses can concern behavioral or technical skills. Two short case studies are presented below.

For behavioral skills courses, a project in a big, international pharmaceutical company was carried out to develop a culture of diversity amongst its employees in Italy and worldwide (about 2,000 in Italy and a total of 90,000 employees around the world). In fact, *diversity management* is increasing in relevance in modern companies [17]. And training is by far the most common component of diversity programs [18, 19] to develop, especially in managers, what is called the "diversity competence" [20].

To this end, the company considered included 5 e-learning pills uploaded on its e-learning platform. In addition, interactive totems in the canteen were used in Italy. The pills dealt with the following issues: developing a culture of diversity, based on openness and acceptance of differences; developing gender inclusion, to overcome prejudices and guarantee equity; promoting work-life balance, to enhance motivation and satisfaction;

transforming parenthood into an opportunity; growing by supporting diversity for self-development. All employees could benefit from these training courses to incorporate a culture of diversity at all levels.

Another project involved a leading telecommunications company on the Italian market in 2006. The training program was implemented to provide management with the motivation and tools required to promote a culture of personal Accountability. The online training program was developed on a Moodle e-learning platform and designed for use with digital methodology and learning pills. The course involved 138 managers, of an average age of 44, from a variety of organizational areas. The multi-media training program experimented included sixty MEPs, each of which dealt with a specific theme relating to Accountability. The pills were classified in three different areas: self (20 pills for personal growth), team (20 pills to develop leadership skills) and company (20 pills to develop work methods and to share the basic values of a responsible company).

The final reports revealed that 62% of the population accessed the platform at least once, while 38% did not access it at all. The most viewed learning pills were those contained in the Self cluster (62%), followed by the Team cluster (23%) and finally the Company cluster (17%). The most "attended" session was the situational area: in fact cartoons and fictional stories were the most viewed learning objects (21%), followed by didactic games (15%) and multi-media lessons (14%). The structure of the course fitted with participants' learning expectations. In depth interviews showed that participants enjoyed both the friendly and creative aspects and open structure of the platform. Particularly, fictions, cartoons, and didactic games were considered positively.

Moreover interviews suggested that Learning Objects helped participants to reconsider their own behavior focusing on both positive and negative situations. Some interesting evidence regarded relational aspects. According to participants, attending the course allowed them to improve their relational skills: they became conscious of some negative traits of their behavior that hindered relations with coworkers [21].

V. CONCLUSIONS

This paper describes the MEPs model. This model is the result of multiple projects and experiences in many important Italian companies. Moreover, some specific aspects of this methodology were the subjects of 7 different Phd dissertations.

The strength of the proposed model seems to come from the combination of an effective educational product (MEP) with the innovation of the learning experience design.

According to our study, MEPs may offer great educational opportunities for constructivist-based courses based on participation, motivation, self-awareness, critical thinking and negotiation of meanings. These opportunities are not to be taken for granted, but should be pursued by all

stakeholders (management, designers, teachers, etc.) involved in training processes.

We argue that the more companies develop awareness of their needs and are open to understanding the opportunities provided by new training approaches, the greater the chances of success related to MEPs are.

Corporations and organizations are often dominated by instructivism and rigid decision-making mechanisms making it difficult to implement change processes. However, in order to survive in a complex, constantly changing environment (we might say liquid environment), enlightened managers should be able to take care of human resources by helping employees to develop strategic meta-skills, such as cognitive flexibility, allowing them to address different situations and unknown problems successfully.

Even project managers, like organizational decision-makers, are required to become leaders of innovation. Their task is to see and let others see. In other words, they should both have the ability to grasp the opportunities that emerge from new scenarios and propose alternative and new routes that overcome the limitations and rigidity of traditional tools and deal effectively with present and future complexity.

Franco Amicucci writes on this: “Designing managerial training for innovation means breaking mental habits that merely identify training with the traditional classroom, and introducing a new vision that includes self-training, innovative classroom, e-learning, outdoor training, and transformation of everyday working within an environment of lifelong learning. From rigid, top-down training plans following a school model, to the creation of opportunities for adult people [...] where innovative training creates new visions of the future, prefigures models and new skills, deals with the dreams of visionary leaders and works on possible advances, towards concrete, feasible, useful but also original training” [22].

Teachers are also asked to know how to use multiple teaching methods, and especially to know the characteristics of multimedia resources to be used properly according to the purpose required. The presence of the teacher is no longer limited to transmitting information. The teacher, in fact, is the one who gives life to the content, makes sure that the stimuli from the multimedia resources are collected, discussed and revised, encourages participation, interaction and negotiation and promotes metacognitive processes.

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