

Are we Ready for a CME eLearning Readiness Index (eCMERI)? A map and a literature review

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Abstract. Continuing Medical Education (CME) is necessary to allow healthcare professionals (like doctors and nurses, but also administrators) to be constantly up to date with new knowledge and technologies. The introduction of eLearning in this field raises numerous issues, this research aims to analyze one aspect by answering the following question: “What are the critical strategies to ensure a high acceptance of eLearning in CME activities in hospitals?”. Based on a previous research that identified the prevalent aspects for eLearning adoption in the corporate context (CeLeRI), a literature review was carried out to create a provisory eLearning Readiness Index for the hospital sector (eCMERI). This index could help CME managers to organize and promote eLearning activities and improve the learners’ satisfaction.

Keywords: Acceptance, Continuing Medical Education, Dropout, eLearning.

I. INTRODUCTION

Continuing Medical Education (CME) is one of the most effective answers to the question of how to offer high quality health services in a continually changing field, in which knowledge and procedures are being constantly refined, challenged and changed. Due to this context, eLearning may play a major role, addressing the needs of training a high number of operators without breaking the continuity of the health service. At the same time, the initial expectation related to the use of eLearning seems to be substituted by a delusion, due to difficulties in adopting and implementing it by organizations and health professionals, and in the high rate of observed abandonment [1].

Other researches discuss the implementation of eLearning in Europe and the USA [2] and have examined the various models for international educational programs [3]. The authors consider eLearning a key tool to offer continuing education to professionals in the medical field. This article analyzes the above-mentioned issues directly addressing the research question: “What are the critical

strategies to ensure a high acceptance of eLearning in CME activities in hospitals?”

The authors consider the findings useful in supporting CME managers to achieve better results in the introduction of eLearning activities.

II. A LITERATURE REVIEW AND A FIRST TENTATIVE eLEARNING CME READINESS INDEX (ECMERI)

In this paragraph the research question, “What are the main strategies to ensure a high acceptance of eLearning in CME activities in hospitals?” is introduced, discussed and answered. First, the eLearning acceptance map (MeLa) is outlined, and the connected eLearning Readiness Index, developed for the corporate sector (CELERI), is introduced. Then, an extensive literature review has been conducted, to identify the main aspects which impact onto eLearning acceptance in the healthcare field, yielding to a first tentative eLearning CME Readiness Index (ECMERI).

eLearning acceptance map (MeLa)

This paragraph briefly explains the work prior to this study. The research is based on a theory of eLearning acceptance called eLearning Acceptance Map (MeLA), proposed by Succi C. and Cantoni L. [4], which aims at understanding the phenomena of acceptance and abandonment of eLearning activities. MeLA is based on the Diffusion Theories, the Technology Acceptance Model, and Learner Acceptance. The map is composed of three levels:

- The **components** (knowledge and commitment), which correspond to the information learners receive before the eLearning activity starts, and the first opinions they collect about the activity.
- The **phases** of the eLearning acceptance process (preparation, action/start, persistence), which go from the first information spread to promote the activity, to the decision of the learner to accept the event, attend, and participate throughout the whole activity.

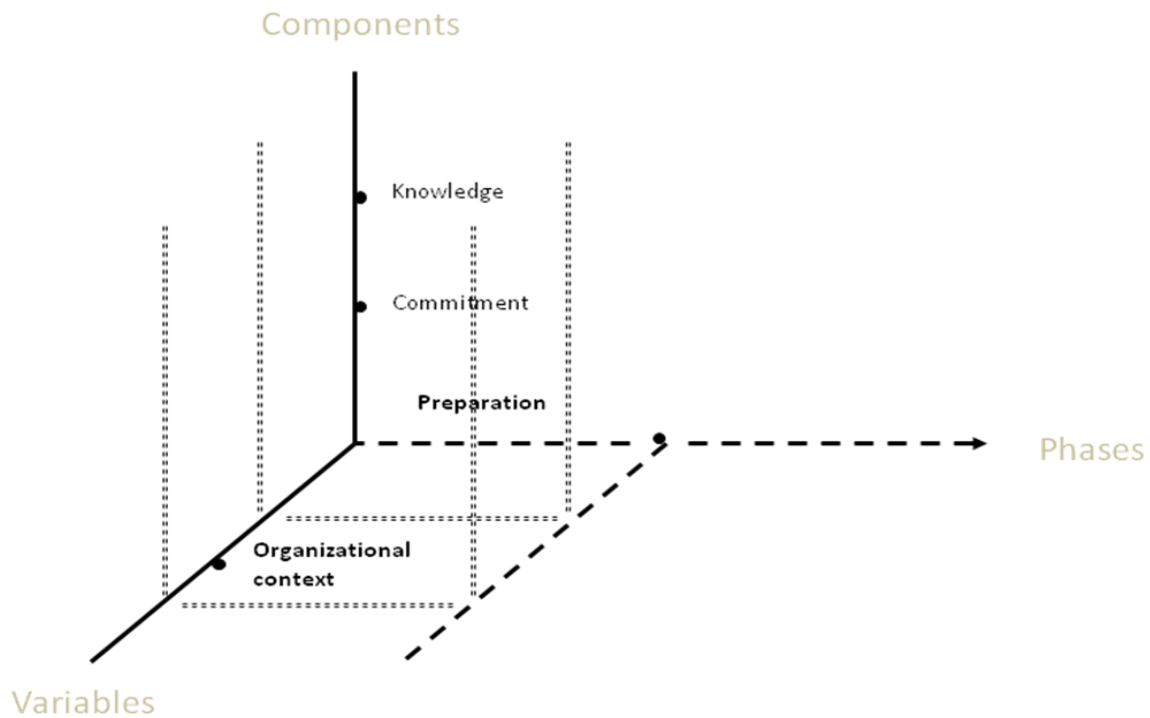


Fig. 1: Scope area of the research to build an eLearning Readiness Index ([4] Succi and Cantoni 2008: 42)

- The relevant **variables** (the eLearner, the organizational context, and the asset), which correspond to the learner's characteristics, the context that can influence participation, and the way the contents are delivered.

To increase eLearning acceptance in an organizational setting, Succi and Cantoni [4] concentrate on the above mentioned preparation phase, organizational context variable, and knowledge and commitment components (see Figure 1). As a result, the authors propose a Corporate eLearning Readiness Index (CeLeRI) that reveals 17 eLearning acceptance enabling actions. The index aims at helping educators in the organization and promotion of eLearning activities. The research tests the parameters to clarify if they are applicable in hospitals.

In order to further study corporate eLearning acceptance in the hospitals' context, this research focuses on the identical research area Succi and Cantoni [4] selected: knowledge and commitment within the "Components" axis, in the Organizational context.

*E*Learning Readiness Index

Corporate acceptance of eLearning has been thoroughly studied by Succi and Cantoni [4] who propose Corporate eLearning Readiness Index (CeLeRI) based on data retrieved from organizations. The study revealed the following 17 enabling factors affecting eLearning acceptance and their consequent entailed actions to achieve acceptance CeLeRI ([4] Succi and Cantoni 2008: 45):

1. *Perceived Usefulness*: build a connection between the eLearning activity and the learner's job.
2. *Corporate Motivation*: to enlist managers in supporting and involving in eLearning activities.
3. *Support*: to provide technical and content support during the eLearning activity.
4. *Goal Commitment*: to specify the behavioral/performance goals of the eLearning activity.
5. *Preparation*: to specify details of the eLearning activity (start date, due date, content, objectives, outputs, requirements, assignments, evaluation procedures, etc.).
6. *Institutional Commitment*: to specify the organization's business goals for the eLearning activity.
7. *Culture*: to align eLearning activities with other training activities and with the organization's values, processes and practices.
8. *Communication Behaviour*: to use communication or internal marketing channels to promote the eLearning activity (direct communication, intranet, posters, newsletters, sponsoring activities, etc.).
9. *Voluntariness*: to specify a target audience and/or the degree to which the activity is compulsory or voluntary.
10. *Time*: to set specific time restrictions/deadlines for the eLearning activity.

11. *Peer Communication*: to place “champions” in the different locations to support activities.

12. *Training*: to prepare/train eLearners about relevant issues and skills in order to attend successfully an eLearning experience (i.e. time management, self-directed learning, etc.).

13. *Perceived Relative Advantage*: to clarify the advantage(s) of eLearning (as compared with other training solutions).

14. *Incentives*: to create incentives and/or a recognition system for eLearning results.

15. *Experience and Expectations*: to track eLearners’ expectations and/or their previous experiences with eLearning.

16. *Perceived Observability*: to provide eLearners with the opportunity to try technologies/tools before actually starting the eLearning activity.

17. *Place*: to set guidelines for the physical environment where eLearning takes place (e.g., space, noise, interruptions, etc.).

CeLeRI aims at helping eLearning managers make choices on organizing and promoting eLearning activities and at improving eLearners’ satisfaction. These parameters are used in the research in order to clarify if they are applicable in the Continuing Medical Education field.

An extensive literature review, toward a first tentative eLearning CME Readiness Index (ECMERI)

An extensive literature review on healthcare education has been done, in order to verify if the CeLeRI parameters have been discussed also for the CME field. Where it was the case, a description of the criterion according to the authors was given, and an example found in the literature was written to better explain the description. Some parameters belonging to CeLeRI were not found in the CME literature, while others have been added, hence defining a first list of 22 relevant parameters.

In order to identify the criteria in the literature, a thorough research through search engines and medical journals was performed to find relevant articles. The following search engines have been used: Google, MedNet, SCIRUS (for scientific information only), Science direct, and Elearningeuropa.info. The following medical journals were studied: Jmir (Journal of Medical Internet Research, www.jmir.org, the articles from 1999-2007 were analyzed), MedEdOnline (Medical Education Online, www.med-ed-online.org, the articles from 1996 – 2008 were analyzed) and the Journal of Continuing Education in the Health Professions (the articles from 1999-2007 were analyzed). A combination of the following keywords was used to find

relevant texts in the eCME context: eLearning, Distance learning, Online, Dropout, success, eCME, CME, e-learning, Electronic learning.

Hereafter the final list of 22 enabling factors, listing reference items, parameters’ description and an example.

1 - *Underline the relevance between the eLearning activity and the learner’s specialty or activity in the job* [Perceived Usefulness, CeLeRI parameter n. 1]

Main author(s): Valenzano D.P. et alii 2000 [5], Del Favero et alii 2006 [6], Ungaro F. et alii 2006 [7]

Description: Healthcare professionals can belong to various disciplines or professions (physicians, surgeons, dentists, psychologists, nurses...); therefore eLearning activities might be directed to different targets. The acceptance of online courses can be compromised if the target is uncertain.

Example: Different learning modules are available for learners with various professional backgrounds.

2 - *Encourage managers in supporting and getting involved in eLearning activities* [Corporate Motivation, CeLeRI parameter n. 2]

Author : Curran V. et alii 2003 [8], Del Favero et alii 2006 [6]

Description: Managerial or supervisor involvement in eLearning activities promotes user participation.

Example: The participation of managers or supervisors in online discussion influences the use of the online discussion area by participants.

3 - *Provide technical and content support during the eLearning activity* [Support, CeLeRI parameter n. 3]

Author : McClennen S. et alii 2003 [9], Fordis M. et alii 2005 [10], Bachmann et alii 2004 [11], Parry D. et alii 2001 [12], Del Favero A. et alii 2006 [6], Rosignoli G. et alii 2006 [13]

Description: The presence of expert feedback about the contents or a technical support can favor eLearning acceptance.

Example: Direct feedback from the course’s authors is available. Users who provide an e-mail address and submit questions or disagreements are promptly answered.

4 - *Specify the expected changes in the medical practice or the behavioural/performance goals of the eLearning activity* [Goal Commitment, CeLeRI parameter n. 4]

Author : McClennen S. et alii 2003 [9], Bachmann et alii 2004 [11], Linetti M. 2006 [14]

Description: Describe the impact the eLearning course is expected to have on the activities performed in the profession.

Example: Develop and maintain electrocardiography reading proficiency.

5 - *Specify the details of the eLearning activity (starting date, due date, contents, objectives, outputs, requirements, assignments, evaluation procedures, etc.)* [Preparation, CeLeRI parameter n. 5]

Author : Curran V. et alii 2003 [8], Langille et alii 1998 [15], Parry D. et alii 2001 [12], Bachmann et alii 2004 [11], Linetti M. 2006 [14]

Description: The eLearners have been informed about the organizational details of the eLearning activities.

Example: The participants are informed about the contents, appointments and duration of the course, and a list with the components of the web-based learning system is available.

6 - *Specify the goals the hospital wants to achieve by proposing the eLearning activity* [Institutional Commitment, CeLeRI parameter n. 6]

Author : Parry D. et alii 2001 [12], Ungaro F. et alii 2006 [7]

Description: The goals the hospital wants to achieve are perceived as important.

Example: Raising health professionals' understanding of health informatics and computer technology, including: the effective use of common software, communication tools, and some of the concepts underlying the use of computers in health care.

7 - *Line up eLearning activities with other training activities, with the profession's and the hospital's values, processes and practices* [Culture, CeLeRI parameter n. 7]

Author: Linetti M. 2006 [14]

Description: ELearning acceptance is influenced by specific cultural beliefs or the tradition of a company.

Example: The effort put into CE must not compromise other professional activities, even though CME increments the participant's skills and increases the value of the company.

8 - *Use communication/internal marketing channels to promote the eLearning activity (direct communication, intranet, posters, newsletters, sponsoring activities, etc.)* [Communication Behaviour, CeLeRI parameter n. 8]

Author : Valenzano D.P. et alii 2000 [5], Holtrop J.S. 2001 [16], Langille et alii 1998 [15], Fordis M. et alii 2005 [10], Colombo F. 2006 [17]

Description: ELearning activities are promoted through communication channels.

Example: Promotion through emails sent to mailing list of professionals interested in the topic.

9 - *Specify a target audience and/or the degree to which the activity is compulsory or voluntary* [Voluntariness, CeLeRI parameter n. 9]

Author : Fordis M. et alii 2005 [10]

Description: Voluntariness influences eLearning acceptance and the way eLearners study.

Example: To be eligible for the study, physicians were required to work full-time or part-time in a primary care setting. Physicians who were unwilling to participate in the assigned educational program were excluded.

10 - *Set specific time restrictions/deadlines for the eLearning activity* [Time, CeLeRI parameter n. 10]

Author : Curran V. et alii 2003 [8], Dobida D. 2005 [18], Del Favero et alii 2006 [6]

Description: Time scheduling might help eLearners participating to the activities.

Example: Online videoconferences are scheduled (one weekly appointment) and the duration of the online course has been set to two semesters.

11 - *Identify persons who support the activities in the different branches/locations* [Peer Communication, CeLeRI parameter n. 11]

Author: Not found in the literature

Description: Peer communication helps eLearners to understand eLearning.

Example: A physicians attends an eLearning event s/he liked and talks positively about it to her/his colleagues.

Comment: Was be maintained in the research: it is an important factor which was not found in the literature but might have an important impact on eLearning acceptance.

12 - *Prepare/train eLearners about relevant issues and skills needed in order to successfully attend an eLearning experience (i.e. time management, self-directed learning, etc.)* [Training, CeLeRI parameter n. 12]

Author: Langille et alii 1998 [15]

Description: Information on the eLearning activities and on the required skills necessary to participate is given to prepare the eLearners to attend the course.

Example: A letter is sent to explain the contents and the activities that will take place.

13 - *Clarify the possible advantage(s) of eLearning (compared to other training solutions)* [Perceived Relative Advantage, CeLeRI parameter n. 13]

Author : Rogers M. E. 2003 [19], Valenzano D.P. et alii 1999 [5], Drahi E. 2006 [20], Curran V. et alii

2003 [8], Langille et alii 1998 [15], Dobida D. 2005 [18]

Description: ELearning must be perceived at least as effective and efficient as other training solutions.

Examples: Students can learn the material at their own time and pace and in the order that makes the most sense to them.

Participation to face-to-face CME is problematic for several physicians due to the difficulties in arranging practice or hospital coverage, spending time away from family, and the cost of travel and attendance.

14 - Create incentives and/or a recognition system for eLearning [Incentives, CeLeRI parameter n. 14]

Author: Rosset A. 2006 [21], Fordis M. et alii 2005 [10]

Description: Incentive systems associated to eLearning activities can increase acceptance.

Example: Bonuses paid to physicians who follow a strategy of error reduction and improvement of care.

15 - Track eLearners' expectations and/or their previous experiences with eLearning [Experience and Expectations, CeLeRI parameter n. 15]

Author: Curran V. et alii 2003 [8]

Description: Elearners' prior experience with eLearning courses influences their attitude towards new computer-assisted activities.

Example: Professionals with bigger knowledge in computer and online services, and with previous experience with computer-assisted CME, give higher evaluations to this type of activity than counterparts with less computer experience.

16 - Provide eLearners with the opportunity to try technologies/tools before starting the eLearning activity [Perceived Observability, CeLeRI parameter n. 16]

Author: Rogers 2003 [19], Allen M. et alii 2003 [22], Bachmann et alii 2004 [11], Gnocato V. 2006 [23], Rosignoli G. et alii 2006 [13]

Description: The eLearning tools are observable before the activities start.

Example: Possibility to participate to a 1-hour orientation session before the eLearning activity starts.

17 - Set guidelines to create the correct environment where the eLearning activity should take place (e.g., space, noise, interruptions, participation from home/office, etc.) [Place, CeLeRI parameter n. 17]

Author: Curran V. et alii 2003 [8]

Description: The necessary environmental conditions are created in order to facilitate the participation to eLearning activities.

Example: Internet connectivity should be available in the same room the teleconferencing activities take place.

New Parameters:

18 - Specify how many CME credits the activity will be worth for the official credit collection

Authors: Allen M. et alii 2003 [22], Fordis M. et alii 2005 [10], Del Favero et alii 2006 [6]

Description: Information is available on the CME credits the course offers.

Example: One CME credit is assigned for every completed module.

19 - Emphasize the possibility of being part of a community of practice

Authors: Drahi E. 2006 [20], Rossett A. et alii 2006 [21], Ferrari M. 2006 [24]

Description: The creation of communities of practice can increase eLearning acceptance.

Example: Information on the possibility (or in certain cases the obligation) of participating to in-presence meetings, chats, forums, etc. that will allow interaction, exchange of ideas and clarifications.

20 - Provide a list of courses that describes contents (activities, course authors and teachers) and number of credits (self-service model)

Authors: Ferrari M. 2006 [24], Linetti M. 2006 [14]

Description: A list of all the available courses (and topics) can facilitate the selection and as a consequence the participation to eCME events.

Example: A list of eLearning products is available for healthcare professionals to choose the most appropriate event to participate to.

Reviewed parameters:

21 - Identify the educational needs the healthcare professionals might have [NEEDS]

Author: Rogers M.E. 2003 [19], Langille et alii 1998 [15]

Description: Learners' needs and problems can be identified to create appropriate eLearning activities.

Example: Focus groups techniques can be used to identify areas of learning that would meet the participant's needs.

22 - A quality output is given to the participants (e.g. a diploma) [QUALITY OUTPUT]

Author: Parry D. et alii 2001 [12], Dobida D. 2005 [18]

Description: E-Learners perceive that eLearning offers them a quality output.

Example: A diploma on the studied topic is offered by a known University.

While parameters 1-10 and 12-17 are the same in CeLeRI and eCMERI, parameter 11 was not confirmed in the literature review, and parameters 18-22, which did not belong in the CeLeRI Index, were newly introduced in the list. The identification of these parameters will allow the development of an eLearning Readiness Index for hospitals; the results will be based on a survey, its first steps are described in the next paragraph.

III. FURTHER RESEARCH STEPS

In order to verify the eCMERI parameters, a questionnaire was created with the intention of answering the research question. The survey will be tested on CME managers working in hospitals in order to examine the questionnaire and modify it according to managers' needs. The questionnaire (Table 1) was based on the CeLeRI parameters. Part I analyzes whether the parameters are being carried out by the hospitals or not and wants to identify their importance. Part II wants to reveal general information about the hospitals.

TABLE 1 : PILOT PHASE QUESTIONNAIRE

PART I

1. Please select the activities your hospital performs before starting an eLearning activity (*select the correspondent checkbox next to each activity*).
2. Please indicate your opinion on the importance of the following activities
(1 = *not at all important*;
2 = *slightly important*;
3 = *moderately important*;
4 = *quite important*;
5 = *particularly important*)

List of Actions:

ACTION 1: Underline the relevance between the eLearning activity and the learner's specialty or activity in the job.

ACTION 2: Encourage managers in supporting and getting involved in eLearning activities.

ACTION 3: Provide technical and content support during the eLearning activity.

ACTION 4: Specify the expected changes in the professional practice.

ACTION 5: Specify the details of the eLearning activity (starting/due date, contents, objectives, requirements, assignments, evaluation procedures, etc.).

ACTION 6: Set specific time restrictions/deadlines for the eLearning activity.

ACTION 7: Specify the goals the hospital wants to achieve by proposing the eLearning activity.

ACTION 8: Line up eLearning activities with other training activities, with the profession's and the hospital's values, processes and practices.

ACTION 9: Use communication/internal marketing channels to promote the eLearning activity (direct communication, intranet, posters, newsletters, etc.).

ACTION 10: Specify a target audience and/or the degree to which the activity is compulsory or voluntary.

ACTION 11: Identify persons who like eLearning activities and positively talk about them to their peers, and involve them in the process.

ACTION 12: Prepare/train eLearners about relevant skills needed in order to successfully attend an eLearning experience (e.g.: time management, self-directed learning, etc.).

ACTION 13: Clarify the possible advantage(s) of eLearning (compared to other training solutions).

ACTION 14: Create incentives and/or a recognition system for eLearning results (other than CME credits).

ACTION 15: Analyze eLearners' expectations and/or their previous experiences with eLearning.

ACTION 16: Provide eLearners with the opportunity to try technologies/tools before starting the eLearning activity.

ACTION 17: Set guidelines to create the correct environment where the eLearning activity should take place (e.g.: space, noise, interruptions, participation from home/office, etc.).

ACTION 18: Specify how many CME credits the activity will be worth for the official credit collection

ACTION 19: Emphasize the possibility of being part of an online community of practice.

ACTION 20: Provide a list of courses with a detailed description of the contents (activities, course authors and teachers) and number of credits.

ACTION 21: Identify educational needs the healthcare professionals might have.

ACTION 22: Giving a formal diploma (or similar) to participants.

PART II

1. What type of eLearning activities does your hospital offer?
2. How many employees work in the hospital?
3. When did your hospital start offering eLearning activities?
4. Which is your role in the organization?
5. Please specify your name
6. Please specify your email address

Expected Results

The interviews should identify problems and weaknesses of the questionnaire and therefore should allow preparing the final version of the survey. The obtained version will be tested on a sample of 200 hospitals and the final version will be sent to about 3000 hospitals in Europe and in the USA to determine if the extended CeLeRI index can be applied to the medical field in order to obtain an eLearning Readiness Index for the medical field.

IV. CONCLUSIONS

The authors consider the list of eCMERI parameters described in paragraph II as a first result of the research. The expected partial overlap with indicators proposed in CeLeRI seems to confirm our hypothesis of special characteristics related to the medical field. The project is ongoing: next steps are composed of testing and validating of the identified parameters through an extensive survey of eCME managers in hospitals. The effort will be devoted to confirming or disproving every dimension and finding a rank between the single voices in order to yield to the final eCMERI. The first step in this process has been done with the definition of a sample of EU and USA hospitals to contact in order to collect the data. We consider that due to the importance of CME and eLearning eCMERI is expected to provide not only a relevant research insight into the field, but also to help CME managers implement eCME programs more effectively and efficiently. This could be achieved considering eCMERI in a dual way, as a tool to guide CME managers in this new area, but also as a set of guidelines, which can foster eLearning acceptance in the healthcare field.

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