The Impact of E-Learning in Education

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Abstract: - It is evident that information and communication technologies (ICT) have transformed our lives and reshaped the nature of everyday activities and contemporary times are often called the ‘information age’ or the ‘knowledge society’. In today's day and age, education plays a big role in which we are and what we can achieve in our lifetime. Planning and implementing courses – no matter whether done for face-to-face education or within e-learning environments – deal a lot with pedagogical issues. Learning is influenced by a couple of factors such as attention, motivation, emotions, etc. as well as by learner characteristics like prior knowledge, cognitive and learning styles, intellectual capabilities, constitutional states and the forth. E-learning is the unifying term to describe the fields of online learning, web-based training and technology-delivered instruction. Nothing is changing as fast as all the terms related to E-learning. In E-learning environments learners interact with learning materials, their instructors and other learners from various locations and often at various times using network technologies.

Key-Words: - E-learning, Pedagogical aspects of e-learning, Factors influencing learning, Learner characteristics, Distance Education, Collaborative Learning, Collaborative E-learning

1 Introduction

E-learning or e-learning, is a word used to describe a particular pedagogical approach to the delivery of education using modern technology. E-learning has in recent times become a "catch-all" phrase for just about any educational resource uploaded and accessible on the internet.

Technological and pedagogical innovation has enabled the development of virtual environments that bring about the possibility of learning with others at a distance. The development of these virtual environments is nowadays an expanding field of research. Continuous training of teachers is a highly suitable field of application for these new ways of promoting learning. Despite the indefinite nature of these new ways of learning, which is but typical of new environments, collaborative learning is being recognized as quite important within professional contexts as means of answering educational needs of the information society. The development of these environments based on the creation of virtual learning communities and their collaborative activities must be the object of further study to guarantee the success of its inclusion in professional development, therefore to improve teacher practice.

Pedagogy and didactic are important aspects for all facets of e-learning, reaching from the creation of the courseware and the application of an e-learning system to the evaluation of the learning progress. An online course for a certain topic may be implemented in various ways and each method differs from each other with respect to aspects of the teaching process, such as the instructional design, the effort for the teacher, the effectiveness of the teaching strategy, or the applicability of an e-learning platform.

2 Collaborative Learning

Collaborative learning (CL) is any kind of group learning where at least some meaningful learning interactions take place among the learners.

Collaborative learning is based on the idea that learning is a natural social act in which the participants talk to each other. It is through talking that learning occurs. Groups are working together on a task, solve a problem or even generate a new product. A collaborative learning scenario makes it possible that learners can discuss and exchange various views with colleagues. Collaborative learning can take place as follows:
- Via mail, phone or other traditional distance learning media.
- By means of virtual environments (e-mail, newsgroups, discussion boards, chat, audio
conferencing, video conferencing, application sharing).
- A combination of the possibilities mentioned above.

Traditional frontal teaching is a learning process where essential learning interactions only take place between the trainer and the learners.

The traditional learning group compared to a cooperative one.

<table>
<thead>
<tr>
<th>Traditional Learning Group</th>
<th>Cooperative Learning Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>No interdependence</td>
<td>Positive interdependence</td>
</tr>
<tr>
<td>No individual accountability</td>
<td>Individual accountability</td>
</tr>
<tr>
<td>Homogeneous membership</td>
<td>Heterogeneous membership</td>
</tr>
<tr>
<td>One leader</td>
<td>Shared leadership</td>
</tr>
<tr>
<td>Responsible only for him-/herself</td>
<td>Responsible for each other</td>
</tr>
<tr>
<td>Only task emphasized</td>
<td>Task and maintenance emphasized</td>
</tr>
<tr>
<td>Social skills assumed or ignored</td>
<td>Social skills taught directly</td>
</tr>
<tr>
<td>Trainer ignores groups</td>
<td>Trainer observes and intervenes</td>
</tr>
<tr>
<td>No group processing takes place</td>
<td>Group processing occurs</td>
</tr>
</tbody>
</table>

By comparing these two scenarios it is obvious that the aim of collaborative learning is to displace learning from a trainer-centered model to a learner-centered model.

2.1 Advantages and Disadvantages of Collaborative Learning

The main advantages of collaborative learning may be as follows:
- Better results in a shorter time.
- Different views can extend the horizon of the learners.
- Problems can be solved more efficiently when people cooperate.
- Experts of various topics can work together and exchange their knowledge.
- Groups can help to understand and explain different circumstances.
- Learners can relate to the colleagues more easily than to the trainer.
- Working together on a task is usually more pleasant than working alone.

Possible disadvantages of collaborative learning may be as follows:
- Learners work at different speed.
- Learning experience/outcome is different for each learner (different roles).
- Group dynamics may have a negative impact on the learning outcome, e.g. one person takes over the group or quiet people miss out.
- Group members might work inefficiently, e.g. discuss irrelevant topics, etc.

2.2 Collaborative Learning: Challenges and Opportunities

Creating a collaborative classroom can be a wonderfully rewarding opportunity but it is also full of challenges and dilemmas.

Teaching in collaborative settings puts front and center the tension between the process of student learning and content coverage.

Collaborative learning goes to the roots of long-held assumptions about teaching and learning. Classroom roles change: both teachers and students take on more complex roles and responsibilities.

The classroom is no longer solo teacher and individual students - it becomes more an interdependent community with all the joys and tensions and difficulties that attend all communities. This degree of involvement often questions and reshapes assumed power relationships between teachers and students, (and between students and students), a process that at first can be confusing and disorienting.

Challenges to collaborative learning at the classroom level are compounded by the traditional structures and culture of the academy, which continue to perpetuate the teacher-centered, transmission – of -information model of teaching and learning.

The lecture-centered model is reinforced (both subtly and blatantly) by institutional reward systems that favor limited engagement in teaching, and give greater recognition to research. Achievement for teachers and students alike is assumed to be a scarce honor, which one works for alone, in competition with peers.

All kinds of teaching, designing and guiding group work takes time to learn and practice. And for students, learning to learn well in groups doesn’t happen overnight.

Most teachers start with modest efforts. Many work with colleagues, designing, trying and observing each other’s approaches.

Collaborative classrooms stimulate both students and teachers. In the most authentic of ways, the collaborative learning process models what it means to question, learn and understand in concert with others. Learning collaboratively demands responsibility, persistence and
sensitivity, but the result can be a community of learners in which everyone is welcome to join, participate and grow.

3 Collaborative e-Learning

Collaborative e-Learning is any kind of group learning that takes place mainly in virtual environments. It can be specified as follows: Modern communication tools enable an active horizontal communication flow between the learners. The basis of this learning scenario is communication, the coordination of the objectives and the quick exchange of data.

If the objectives are quite similar, the activities in a collaborative e-Learning scenario will be much more actively.

Virtual groups can be built up by using e-mail, chat, bulletin board, audio conferencing and video conferencing. Within this virtual group the participants can discuss the project/task and bring in different points of view.

The trainer and the learners can work together without being bound to a common place.

Moreover the timing can be defined individually if no real-time technologies are used.

Among current web-based collaborative learning tools, enumerate the following:
- E-mail is mainly suitable for small-sized groups.
- A public conference, e.g. a stored transcript of a discussion by a group in an easily accessible format is suitable both for instructor-learner collaboration and learner collaboration.
- A private conference – a public conference limited to the subset of the class specific to the current project – is suitable for a multi-task lesson.
- A gated conference which is also described as a question and answer protocol allows learners to re-read all the previous answers before giving their own opinion. According to Clark it is a powerful tool that is rarely implemented.
- Video-conferencing can be exchanged through the Internet by learners to emulate a discussion or conference. It is rarely used and it is more likely that public conference items may contain much more attached audio and video to augment the content.

3.1 Advantages and Disadvantages of Collaborative e-Learning

The main advantages of collaborative e-Learning may be as follows:
- Increased flexibility of time and location.
- Enhanced motivation because of new learning scenarios.
- Improvement of informal communication via e-mail, chat etc.
- Easy and concise access to the online-Learning material by using platforms.
- Support of traditional teaching and learning methods.

Possible disadvantages of collaborative e-learning may be as follows:
- If new learning environments are implemented technical problems might occur, e.g. complications with the access or a loss of data.
- If there is no adequate infrastructure, the motivation of the learners will be decreased.
- If the learners have no or only little experience in using collaborative e-Learning.
- Some learners don’t have either the willingness or the competence to learn individually or in groups.

Collaborative e-Learning can be implemented as follows:
- Choose a collaborative learning technique.
- Prepare problems/questions for learners well.
- Provide a clear work-plan for the learners.
- Test all equipment and programs you want to use.
- Be prepared for technical problems during the starting phase.
- Insist on individual accountability.
- Provide regularly tutoring.
- Supervise the progress and get learners back on track, when they get off topic.
- Keep their attention at a high level during the whole e-Learning time!
- Call people on the phone, if necessary.

4 Pedagogical Aspects of Learning and Implications for E-Learning

The majority of lecturers surveyed used e-learning in their teaching practice, most commonly to research, access and create teaching materials and prepare lesson plans. E-learning was used less frequently to communicate with learners, track learners’ progress and provide one-to one attention. Few lecturers used e-learning all the time for any task, while those using it over a wide range of tasks were also in the minority.

Use by learners showed some similarities to lecturers’ use: overall learners were commonly reported to use e-learning to undertake research, present work and work independently, but less to catch up missed
work, contact the lecturer out of class, or work collaboratively with peers out of class.

These similarities appeared to be partly the result of a link between learners’ and lecturers’ use. For example, learners were said to use e-learning more to develop their understanding where their lecturers used it more in this way.

Lecturers reported themselves to be effective in planning, preparation and sharing materials. Fewer felt that they were more effective in meeting learners’ needs, tracking progress or being more efficient.

Education can be understood as “activity undertaken or initiated by one or more agents that is designed to effect changes in the knowledge, skill, and attitudes of individuals, groups, or communities”. In contrary, the term “learning” emphasises the person in whom the change occurs or is expected to occur. Thus, learning comprises “the act or process by which behavioural change, knowledge, skills, and attitudes are acquired”.

Four factors can be outlined as significantly important for the learning process:
- **Focus of attention** determine if a student mentally follows a lecture and, therefore, if the intended behavioural change affects a learner at all. E-learning particularly requires a strategy for getting and keeping the learner’s attention
- **Motivation states** of students are of importance when questioning how the stimuli given by the teacher promotes the learning process.
- **Emotions** have, similarly to motivation, a strong impact on the learning process.
- **Experiences of the learner**. Learners can construct new understandings by tying up to previous experiences, which may not have been activated yet. In this way, learners become capable of understanding conceptual changes, adopt knowledge regarding their culture or everyday life, and even improve meta-cognitive abilities.

**Learner characteristics:**
- **intellectual capabilities**, each learner has a unique profile of intellectual capabilities;
- **learning preferences** usually result from predispositions or orientations to learning and can be seen as influences by the context;
- **cognitive and learning styles** which are somehow related to intellectual capabilities and preferences
- **constitutional attributes and states of learners**, which may deal with physical properties of the body like disability, age, etc. as well as with short-term states of students, such as tiredness, concentration, emotional and motivational states and the like.
- **self-efficacy and meta-cognition influence the learner’s achievement in the learning process**. Self-efficacy comprises a student’s evaluation of the ability to perform a given task through different senses.
- **the background knowledge of a learner comprising language and computer skills as well as experience on a related situation by means of a familiar context** may also have an impact on learning.
- **the user’s prior knowledge and experience in the domain**. Experience determines the user’s model of a knowledge space, the way of browsing through and mastering tasks in a domain.

These seven classes of learner characteristics, it can be said that the result of learning is highly dependent of the learner itself. Teachers as well as e-learning content creators and online instructors have to know very much about pedagogical aspects and provide a large set of methods to support different kind of learners by means of the characteristics depicted above.

It has to be pointed out that the issues depicted so far comprise just the most relevant and learner-centred factors of the learning process. A full overview about the complexity of learning can be read somewhere else. Nevertheless, it can be stated that the most critical factor for successful learning is the learner. The most important difference between the classroom situation and e-learning can be outlined with the statement that a teacher can adapt the learning process much more effectively by holding a lecture in the class, since communication in both directions – from the teacher to the learners and vice versa – is faster and more effective. In contrary, it is much harder to evaluate a factor of the learning process or learner characteristic and react to it via e-learning platform. Research mainstreams such as adaptive instructional systems or adaptive e-learning deal with aspects of adaptation in e-learning environments to improve the learning process.

**Factors associated with the impact of e-learning:**

Lecturers’ use of e-learning was associated more with their own attitudes and confidence than with their personal background characteristics or the context of their institution. In addition, the extent to which lecturers felt that they had sufficient access to e-learning resources, and support, were associated with having a positive attitude. These are not proven causal relationships but it seems likely that the interrelationships between use, confidence, attitude and access operate multi-directionally, working to reinforce one another, either positively or negatively.

**Impact of e-learning on teaching**

There were strong similarities between the areas where lecturers used e-learning and where they perceived it to be effective, with the most commonly reported impacts being on planning, preparation and sharing materials with lesser effects on aspects of the
teaching-learning interface and the smallest impacts on administration and management or efficiency. For instance, around three-quarters of lecturers considered that they were able to prepare for teaching, through researching and creating materials, more effectively as a result of e-learning. A smaller proportion (around two-thirds) felt that they were more effective in presenting information in front of the class and in making course materials available to learners due to e-learning use, with around a half believing they were more effective at developing learners’ understanding. However, just over a quarter felt they were more effective at tracking learners’ progress, and only one third felt that e-learning had assisted them to save time.

**Impact of e-learning on learners**

There were also similarities between lecturers’ use of e-learning and their perceptions of its impact on learners. The majority felt that e-learning had helped learners become more effective at creating visual presentations, presenting written work and researching topics. Seven out of ten thought e-learning had helped make learners more effective at reinforcing their knowledge, half felt that learners engaged more effectively with the subject in the classroom and nearly half felt that learner motivation had increased because of e-learning use.

The classification of ‘presentational use’:
- e-learning as a medium for facilitating and managing learning:
  - make course materials available to learners;
  - share course materials with colleagues;
  - communicate with learners outside the classroom;
  - manage individual target setting;
  - test learners’ understanding;
  - track learners’ progress.
- e-learning as a preparation and presentational tool:
  - prepare schemes of work;
  - research and access teaching materials;
  - create teaching materials;
  - present information in front of the class.
- e-learning as a learning tool:
  - provide one-to-one attention;
  - develop understanding;
  - deliver differentiated lessons.

**Factors associated with the impact of e-learning**

There was limited evidence of a direct relationship between lecturers’ and learners’ reported use of e-learning for a range of purposes, and the end-point achievement, retention and quality of teaching outcomes in the institutions as a whole. Although such outcomes were more closely associated with background and contextual factors at college level, there was evidence that achievement in a college was higher where lecturers used e-learning more frequently for preparation and research for teaching.

The extent and nature of learners’ reported use of e-learning was associated more with their lecturers’ attitudes and use of e-learning than with background and contextual factors. The evidence suggested that there was an association between the way in which lecturers used e-learning and their learners reportedly using it in a similar way. More specifically, lecturers who used e-learning to support a learner-centered approach tended to consider that learners used e-learning more for independent learning and were more effective as independent learners as a result of e-learning.

There appeared to be a close inter-relationship between lecturers’ confidence in, and attitudes towards, e-learning. Lecturers’ confidence and attitudes were associated with their use of e-learning and perceptions of the outcomes for their learners. The evidence suggests that there is a complex inter-relationship between these factors and, therefore, that a change in any one could be associated with a change in a number of others.

Having sufficient access was also positively associated with the extent to which lecturers used e-learning when teaching to develop understanding and for sharing materials, suggesting that lecturers may use e-learning more in these ways where they have sufficient access.

**5 Conclusion**

Collaborative learning at Web-based environment may give as good results as classroom learning or even better. Although existing integrated software packages provide the ability for collaborative learning and cooperation among users, an individual student and group of students who involved in the collaborative learning environment has to be motivated and intend to active participate, share the ideas and provide the leadership. The collaboration and the interaction among students-instructor and students-peers are the keys and can be conducted via the synchronous chat or asynchronous forum board. It takes a lot more time than regular teaching.

In a context of overall positive attitudes, on the part of lecturers, towards e-learning, the research findings indicated that there were some possible barriers and enablers to e-learning use in further education. These included:
- Having an ethos and environment within an institution through which lecturers can improve their confidence, see the potential for e-learning, and have a positive attitude towards its use, could
contribute to increasing its use among lecturers and, in turn, learners.

- Ensuring that lecturers have sufficient access to e-learning resources to use in the classroom, in addition to outside class, could be a key enabler in developing lecturers’ confidence in the use of e-learning and increasing its use at the teaching and learning interface. In turn, increased use by lecturers could lead to an increase in the use of e-learning in this way by learners.

- Providing sufficient support for lecturers, particularly in terms of providing enough time for them to develop and embed their use of e-learning in their everyday teaching practice, could be a key enabler for increasing the use of e-learning in further education and supporting the achievement of intermediate outcomes, such as the development of learner understanding and independent learning.

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