

E-LEARNING: THE DEPARTURE OF THE HUMAN FACTOR IN EDUCATION

Stuart Cunningham, Richard Hebblewhite, Vic Grout, & Denise Oram
*Centre for Applied Internet Research (CAIR), University of Wales, NEWI
Plas Coch Campus, Mold Road, Wrexham, LL11 2AW, Wales, UK
{s.cunningham /r.hebblewhite /v.grout /d.oram}@newi.ac.uk*

ABSTRACT

Electronic learning (e-learning) is a field that has undergone exceptional development in the last five years, and has received a considerable uptake amongst educational institutions at all levels, particularly in Further and Higher Education. This trend in utilisation of on-line and electronic resources has been increasing and has been coupled with the ability to promote distance and open learning, where the role of the tutor or teacher has become gradually remote and detached from the method of delivery used in education. Will on-line and electronic learning & teaching eventually eliminate the need for human teachers and lecturers? What effect, if any, will this have on students? This paper presents issues for discussion.

KEYWORDS

E-learning, AI, computing, learning, teaching

1. INTRODUCTION

Due to the widespread proliferation of computers, the Internet, and related technology amongst all educational areas, homes, and workplaces of everyday people, the trend for e-learning has grown exponentially. Electronic materials in all aspects of education have become the norm. This together with the development of new and innovative technologies in the provision of e-learning could mean that there are fewer requirements for a human factor, a person or expert, to be involved in the educational process, particularly in the area of delivery and assessment. The possible effects (strategic, technical, social and ethical) of removing the human factor from education, and replacing this with a system of pure electronic learning are discussed.

2. THE E-LEARNING ENVIRONMENT

The type of facilities provided by a system of e-learning will determine the degree of human interaction and intervention which is involved or required in the educational sphere. It is useful to define two types of e-learning, which are categorised by the style and delivery mechanisms they support:

1. **Supportive E-learning:** An environment where electronic and on-line learning materials and resources are used by students to reinforce and support the main teaching digest. This type of e-learning is perceived as an aid or activity which underpins traditional classroom activities, lecture, viva, and dialogue. The e-learning setting may merely be a medium for storing and distributing information, or could be used to collect submitted work or provide simulations and activities. It does not, however, attempt to take the place of the educator, or be the sole medium of education. In fact, it does the opposite of this, by fortifying the role of the human tutor.

2. **Pure E-learning:** This type of educational environment incorporates the supportive e-learning methodology, while also attempting to simulate or provide the background and delivery mechanisms which would normally be produced in a traditional educational situation. It is one where there is no real-life student-to-student or student-to-teacher interaction. All materials are presented, and all student work is submitted, electronically. In such an environment, a student may never be in the same room as the teacher or other students on the course. The most untainted of pure e-learning environments would theoretically not require a human tutor to be involved at all, and would be replaced by a system of AI.

3. INTELLIGENT TUTORING SYSTEMS

In both a pure and supportive e-learning environment, the implementation of intelligent, adaptive forms of tutoring support will doubtless be a growth area. Much research is devoted to the development of online Intelligent Tutoring Systems (ITS) that are capable of delivering adaptive source material in conjunction with a pedagogical style, whilst adapting to suit the learning styles of the perceived student. There is much debate regarding the effectiveness of such technology, along with the problems concerning the implementation and perceived benefits in terms of widening participation.

ITS generally provides a high level of guidance and control for interactive processes in great detail. Possible navigation decisions by the users are controlled by the system. Recently, ideas from both intelligent tutoring systems and from hypermedia have been brought together. This has led to interactive and adaptive hypermedia, which is used in many systems. This synthesis responds to the specific strengths and weaknesses of both approaches. A domain model representing all facts of the field to be learnt usually forms the background for a model of the learner's knowledge and knowledge acquisition. The Intelligent Tutoring System is essentially a development of the standard interpretation of computer-assisted learning, but has the benefits of several key advances in design.

With the ever-expanding number of worldwide Internet users, academic institutions now open their arms to larger audiences using advances in Internet and AI technology. The questions and problems concerning the implementation of such technologies are numerous. For example:

- How can adaptive hypermedia be used to effectively teach those who cannot physically 'meet' with a real tutor?
- How can such a system carry out the formative assessment of academic work? If not, does this mean that such technology can never become more than a mere teaching supplement?
- What is interesting and engaging for one person, may be exactly the opposite for another. Would a pure e-learning environment be able to adapt to the requirements of the individual while still maintaining the required level of content?

The main issue to rise from the inclusion of ITS and pure e-learning is:

- Will on-line and electronic learning & teaching eventually eliminate the need for human teachers and lecturers?

Other issues of importance are also diverse in such a system:

- Is there such a thing as a class or student cohort in a pure e-learning environment?
- How do you get an entire class or group interested in an educational activity?
- How do you motivate someone to *want* to learn in a purely electronic environment?

A final source of concern may be the complexity of such an adaptive system. Multiplicity of levels of operation and functionality often imply exponentially increasing code sizes and run-times. Although such calculations fall outside the scope of this paper, an awareness of potential complexity problems is advisable.

4. ETHICAL CONSIDERATIONS OF E-LEARNING

If we are to consider the departure of the human factor in education, then the use of ITSs imposes critical challenges that need to be addressed. There is a need for an understanding of the human, social and ethical implications, as well as the strategic and technical factors that are affected by the impact of these technologies.

If we are to address these issues in the future, we need to look at social issues such as student isolation, motivation, satisfaction and inspiration. To be successful, technology has to lend itself to the human element to relate to the human psyche and philosophy.

Educational issues have to be addressed in the development of ITSs in the representation of learning outcomes, and in adequate teaching and learning strategies to meet the diverse needs of all students, taking into consideration their individual cognitive abilities. Human elements such as 'praise' have to be included and these can impose difficulties when converting a set of rules to code. An ITS has to offer the student the same educational and pedagogical experience as human tutors Doukidis, Angelides, Harlow, (1989). It is crucial that the system incorporates a deep understanding of the student's needs if the ITS aims at replicating the way humans learn, as a false assumption in a system propagates further throughout the learning process.

For the future success of these systems perhaps there is a need to change the culture of the learning environment. At present learning is experienced via small screens; in the future these environments may include screens that are 'large as life'. Harel & Papert (1990) emphasise the importance of research into how microworlds and Intelligent Learning Environment (ILEs) will change the learning environment by making extensive changes to the physical layout of the classroom.

Failure to consider all these issues adequately can lead to problems. However, if they are addressed, the departure of the human factor in education may well become a reality.

5. CONCLUSIONS

Highly intelligent tutoring systems sound far fetched, but such approaches to e-learning are not beyond the bounds of current technology or capability. The challenge to the educational environment is to decide whether or not to reap the benefits of pure e-learning. Thereby opting for the easier, if somewhat more risky option of creating a perfect learning environment where a minimal amount of involvement is required. The alternative is to promote supportive e-learning, and continue with a traditional approach of teaching and learning, which is supported to the fullest extent by electronic resources and facilities, which do not fill the role of the tutor.

There are various ethical and sociological issues that surround this concept. Analysis of the humanist issues involved is also required, and these subjects are beyond the scope of this paper. Hopefully some pertinent points have been raised within this document, none the less.

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