INTERACTION IN THE LEARNING ENVIRONMENT TAKES PLACE IN THREE WAYS: WITH THE COURSE MATERIAL, WITH OTHER STUDENTS AND WITH TUTOR.

INTRODUCTION

Interaction is a fundamental term which is always present in debates on Distance Education. This essay proposes to approach it from the conceptual and application aspects, in order to show how interaction has been understood by educators and businessmen, and how course designers have been using technology to develop courses which aim to be interactive.

The concepts and arguments put forth herein originate from two sources available within the H802 course. One of them consists of the ideas and experiences of several authors drawn from the material of this course throughout 1998. The other consists of my own experience as a student, interacting with conventional and online material, with my tutor and my colleagues.

INTERACTION AND INTERACTIVITY

Conceptual Aspects

For Wagner (1989) Interaction and Interactivity are two different things. She is of the opinion that while Interaction is an attribute of the educational process (pedagogical function), Interactivity is an attribute of some systems for delivering teaching to learners (technological function). For other authors, such as Hawkridge and Edirisingha (1998), there is no distinction between interaction and interactivity, thereby making these two terms interchangeable. Their view is that interaction is the noun and interactive is the adjective from which one forms the noun interactivity, and both terms are used indiscriminately to describe something that happens between two or more entities. However, they say, one cannot confuse ‘reaction’ (one entity acts on the other but the second entity does not act on the first) with ‘interaction’ (each entity acts on the other in a reciprocal action).

In fact, depending on how one views interaction, it can either be understood as a form of two-way communication, in which there are exchanges between the entities present in the environment, or a one-way relation which triggers stimuli-responses. Durbridge (1997a), for example, says “someone who conceives of learning as a process essentially dependant upon effective social interaction will probably be particularly interested in analysing a range of communicative acts within a particular social setting and noticing or deducing the influences of this context upon the understandings negotiated. Someone particularly interested in independent learning however, might focus more deliberately on the notion of individual learning, and analyse interaction as a closed system – action, effect, next action – in this light”.

Although many people deem as interactivity the one-way relation between a user and a computer, e.g., switching on, mouse manipulation, keyboard work versus a screen lights up, symbols and noises appear, this does not seem to be sufficient to explain a learning and subject-matter interaction. For Durbridge (1997b), Reciprocity – the observable or deducible effects of one action upon another - is a key feature of Interaction, although it is still not well known "how a person's consciousness …is changed or how any such change is influenced by an action … how the material and mental worlds might be related so that they can interact, yet this is what is needed if the effect of an action can be nourishing of thought and vice versa."

Technological Aspects

The discussion of interactivity in education, particularly in distance education, is not new in the western world. Several lines of research have sought to understand how different technologies and media can contribute to improve the student's interaction with the course material, with the tutor, with the colleagues and with the staff in the teaching-learning environment. In a way, one can say that there is already a store of accumulated experience in this regard. However, after the appearance of the hypertext environment, which allows both communication among people through a network and random access to the course material, the discussion on interactivity has received a new stimulus. In addition to the interaction between the student and the study material, research has begun on the interaction with the computer.

The 'reciprocity' factor mentioned above must also be taken into account in the human-computer interaction. This prevents a team developing a computer course from falling into the trap of using the action-reaction principles (one-way) in the illusion that it is promoting inter-action (two-way). Durbridge (1997c) says that what has been called interaction "can be explained in material terms: visible and audible, but not in mental terms, i.e., …the crucial but invisible influences upon human action (cognitive and affective events such as interpretation and judgement) are thus neatly sandwiched between visible actions and visible effects on a screen"

By means of a broader analysis of interaction and technologies, this same author shows how the concept of Interactivity has been used to sell computer technologies. Within an academic scope, the 'learning by doing' and 'by being active' discourse is used as if it were Interactivity, to sell the myth that interaction is, per se, a 'good thing' and that multimedia offers the best opportunities for interaction. Within an industrial scope, interactive games have sold the illusion that a person is active within a real three-dimensional space. Interactivity then becomes the 'thing' responsible for selling games. This way the commercial appeal of the potential offered by the computer for interaction seems to support the academic debate on activity-interactivity in learning, and vice-versa.

INTERACTING WITH THE MATERIALS

In open and distance education, a considerable amount of research has been carried out on materials, in view of their importance as learning mediators. In this paper, two types of educational material will be discussed: print and hypertext environment.

Print material

Traditionally print is seen as a powerful resource in the teaching-learning environment due to its capacity to develop in students the skills which education considers essential, i.e., the ability to understand principles and concepts and to think critically about the ideas which are presented.

This is still the most commonly used medium in distance education due to its accessibility, portability and standardisation. Any student, whatever his/her location or destination, can easily get in touch with the contents of a course through print material. The same is not true, for example, when the contents are conveyed through video, audiocassette or computer, which require standardisation and special equipment. Cost is another factor which explains the success of this type of material. According to Bates (1995a), print, next to pre-recorded instructional television (lectures), appears to be the least expensive one-way technology.

Print material basically consists of a written text, accompanied or not by diagrams and pictures, in black and white or colour. In an educational environment, it is presented in different forms, such as text books, papers, study guides, and is delivered to the study via mail or computer. Each type of print material requires suitable technology in order to be written and transmitted, and this affects the type of interaction the student has with the study material. Depending on the type of learning the tutor deems important, print can be used in several ways: ranging from using highly structured and controlled texts (reflecting a behaviourist approach), to using texts with little structuring and guidance.

Whatever the form, print always presents weaknesses. Bates (1995b) says “the major weakness of print is the difficulty it has in assisting students who have failed to understand parts of the text. There will always be occasions where alternative explanations or a different approach are required for those students who have difficulties … and this is often where an intervention from a tutor is most necessary. Another weakness of print is its difficulty in providing feedback for questions that have a variety of acceptable responses, or which require complex or elaborate responses, or for challenging and ‘discussing’ the appropriateness of students’ responses to in-text questions. Furthermore, students can easily go to the printed feedback, where answers or ‘discussion’ of the activity are provided, without actively engaging in the exercise”

In addition to the above-mentioned weaknesses outlined by Bates, one can add another weakness of the use of print material in distance education - actually not of the material itself but of its conveyance when done via mail. My experience in H 802, for example, shows that no matter how organised the material delivery system may be, there is always a chance that the student may not receive it, or receive it with a delay, hindering his/her studies. This can be due to an error on the part of the student for not having informed his/her address correctly, or on the part of the teaching institution which, for any number of reasons, can be sending the material using a wrong address, or on the part of the postal service itself.

Hypertext environment

Hypertext can be understood as any type of material, such as text, graphics and video, designed to be read non-sequentially or in a non-linear way. A hypertext environment offers tutors and students new and different forms of teaching-learning. Landow (1992), upon analysing the use of this technology in learning, points out several advantages of hypertext over other conventional means. Among them he mentions reutilization of material, linkage between materials and subject matters, student-material interaction.

The hypertext environment works as a container of information which can serve various purposes, either simultaneously or not. Good educational material which has been written by a tutor for a course can be rapidly reused in another context. A good example of this is my experience with the use of a 'Tool box'- repository of knowledge originating in Physics and Mathematics – serving as a common basis for different online engineering courses.

The possibility of accessing information easily and quickly, as well as being able to combine it in different forms, makes hypertext an unexcelled technology when compared to any other conventional technology. Good libraries always have a lot of information stored in different books, but the access to and combination of this information offer far less agility and efficiency than can be achieved through hypertext.

The interaction of the student with the course material is another aspect which distinguishes hypertext from any other type of learning, due to the alternatives it offers. A student can be interacting with the material, for example, while navigating through the site choosing his/her own learning paths, making simulations or doing exercises, receiving feedback. However, none of this ensures an effective two-way communication or learning on the part of the student.

INTERACTION AMONG STUDENTS

Promoting interaction among students who are geographically dispersed is not an easy matter. Traditionally this interaction was quite limited, and had to be handled through letters, phone calls or fax
messages. With the appearance of personal computers and the Web, communication (whether synchronous or not) among colleagues has become efficient and fast, through the use of E-mail, Listserv and computer conferencing. Some authors such as Harasim (1989) say that online education based on computer conferencing stands out as a new learning domain on account of its particular characteristics in teacher-student and student-student communication.

Email and Listserv

Email and Listserv brings the information to the students, directly to their mailbox, without their needing to access the course site to seek the information. If on one hand this is an advantage, mainly because sometimes students have difficulty in accessing the site, on the other hand there is the disadvantage of the student, at any given time, receiving a large quantity of messages regardless of his/her desire or control. The fact that Listserv is organised by order of arrival of the messages, and not by threaded-topic, also does not make learning any easier. The student receives the data but is unable to visualise the linkage among them. For these reasons, this technology would appear to be appropriate for the exchange of urgent messages or an exchange of ideas when structuring is not important.

Computer mediated communication

For Romiszowski (1997), CMC has a wider range of application than computer conferencing. It includes any form of organised interaction between people, utilising computer networks as the medium for communication. The attractions of CMC for future educational systems are many. First of all, it is yet one more and particularly versatile approach to the delivery of 'distance education'. Second, it is asynchronous, allowing the students to read the messages and respond at their convenience. CMC, pursuant to this author, seems to be the fastest growing area of educational technology research and development at the moment.

Unlike Listserv, the student must access the site to participate in CMC. The threaded-topic format typically used in CMC, such as used in H802, organises information by subject matter and makes available functions such as 'history', 'jump', 'new replies' and 'all in one page', which contribute enormously to the smooth unfolding of conferencing. However, this type of communication still presents some weaknesses. In the discussions of the H 802 course, one can observe that the same messages were sent twice (e. g. msgs # 330/331 and # 332/333). This occurs because the system does not

allow posted messages to be erased causing undesirable consequences such as feelings of hopelessness on the part of message senders who may wish to correct any errors immediately but cannot do so; feelings of 'time wasted' on the part of message readers who have to read part of the messages before realising that an error has been made; the unnecessary information that overloads the database; and the lack of accurate information generated for statistical purposes (amount of existing messages).

Also in the discussions of H 802 the asynchronous aspect which in most cases is considered a strength in computer conferencing may, in other instances, cause frustrations to participants. Sarah Kirk, in one of her messages replying to one a coleague's complaints, writes "The key benefit of this kind of distance learning is that we can all fit it in with our other lives - we don't have to get together in the same place at the same time in order to work together. However, as you point out, this can be a major obstacle sometimes - you don't get answers when you need them." <Sarah-k, msg #384>

Collaborative Learning

Interaction among students is a type of communication which is associated with collaborative learning or group learning. The idea of collaborative learning is that the acquisition of knowledge, skills or attitudes is an inherently individual process but which is also influenced by the group and by interpersonal interactions. Collaborative learning stems from the supposition that each participant has individual knowledge and experience to offer and share with the other members of the group and that, when they work together as a team, one helps the other to learn. This interactive interchange among participants generates group synergy where 'the whole is bigger than the sum of its parts'. But collaborative learning benefits are not always achieved, and in some circumstances, unequal collaboration by group members may lead to disincentive, conformity, lack of initiative, misunderstandings or conflict, impairing group interaction.

With regard to my personal experience with learning through interaction among students, I would remark that many students are still shy in participating in group discussions. This could occur for a variety of reasons, such as being afraid of exposure to the group (virtual discussion seems to be able to mitigate but not eliminate this fear), and difficulty in dealing with the medium interface. In one of the discussions in H 802, Brian Joyce states that H801 participants made fewer contributions while the number of observers was larger than that of active participants. He attributes this fact to the lack of external control, inasmuch as active participation in the H801 debate was not compulsory, and the material for discussion did not constitute an input for the TMA, as was the case in H802 <brian-j msgs # 308 and #322> In fact, it seems that the structuring of students in small groups and the assigning of roles, as used in H 802, are resources which significantly contribute to teach and facilitate the students to work in a group.

INTERACTION WITH THE TUTOR

Interaction between students and the tutor at a distance can take place on a one-to-one basis (email, telephone, fax) or collectively (BBS). In the individual interaction, the communication is initiated by the student and directed to the tutor, normally in the form of a request for assistance; or else addressed by the tutor to the student in the form of providing help or feedback.

Individual interaction with the tutor

This type of interaction has distinguished distance education and independent learning. Helping the student has a positive influence on learning, and the communication media increasingly facilitate the search for and the supply of help. However, this communication facility also brings a disadvantage. Even when able to ask course peers for help, some students seek out the tutor more often than strictly required, resulting in a work overload for the tutor. Some of the underlying reasons for this behaviour are: the belief that the tutor can teach better than the colleagues, and, in the private space (student-tutor) the student is more willing to show his/her weaknesses than in the public space (student-computer conferencing). Another important aspect in a distance education environment is the interaction originated by the teacher to provide guidance or feedback to the student. A student can learn a lot from the comments of the tutor in his/her assessments. Points which are reinforced or criticised by the tutor serve as a guide for the student in the continuance of his/her studies.

Currently technology allows "virtual tutors" to play the role of real tutors in providing guidance and feedback to the student. However, the design of a course capable of providing a learning environment which would allow the interaction of learners with the tutor's ideas seems more important that the technology itself. A good course transmitted through print material can promote better interaction than a poorly designed online course.

Interaction with the tutor in computer conferencing

In computer conferencing attention focus is shifted from the teacher to the student-student communication. The teacher provides the topics and serves as a facilitator, and the students engage in debate among themselves. A point to be brought out is the importance of tutors' actions in structuring group activities in order to facilitate debate among participants. Many believe that if topics, debate threads, and the roles for group

members were not determined by tutors, the majority of students would never participate in conferencing, and those who began to do so would eventually give it up. Sara Kirk, in discussing this in H 802, thinks that control is necessary to get the group started but once discussions proceed swimmingly there is no need for further control. <Sara-k msg # 430>

The interventions of the tutor in the debate should serve, for example, to clarify misunderstandings, or delve deeper into matters that are being debated superficially. The tutor has to portion out his participation in the conferences so that the students feel that he/she is present and attentive. Harasim (1998) proposes the assignment of a moderator to stimulate small groups and, in this case, the tutor, instead of working directly with the group, would work with the moderator, orienting him/her on how to stimulate the group.

CONCLUSION

A lot of research has been done on interaction in distance learning environments, either analysing the potential of the conventional technologies and educational means, or the potential of the hypertext environment. This essay shows the results of the work of some researchers from which some conclusions can be drawn, as presented below:

1) Technologies and media are not interactive per se, but interaction in the learning environment depends largely on good course designs.

2) There are no good or bad technologies or educational media. Their strength depends on the context in which they are to be used.

3) A relation of exchange between the student and the course material (print, computer, etc.) does not necessarily mean that there is a two-way interaction.

4) The fact of interaction between student and course material is not sufficient to assure the student's learning. Many other factors are involved, such as assistance from the teacher or colleagues.

5) New information technologies should be used as learning resources and not as technologies which have arrived to address all the old problems of the teaching-learning process.

6) New information technologies should be used critically by the decision makers and course designers. Before buying a technology, it is necessary to have a clear idea of what one wants and what it can offer.

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