The Evaluation of Online Courses

Draft of:


Abstract

*Given the special characteristics of online courses, their quantitative/qualitative evaluation calls for the adoption of specific procedures to assess both the learning process and the participant performance. This paper will seek to shed light on the aspects and issues involved in the evaluation of online courses, focusing on the peculiarities that distinguish such evaluation from that of traditional distance education. Subsequently, a methodological approach will be proposed that was developed and tested during evaluation of online courses for in-service teacher training and for training of staff in small and medium-sized enterprises.*

While online education processes share a number of common characteristics with face-to-face courses, the very fact that they are delivered from a distance means that there are new variables to assess, especially where evaluation of the entire process is concerned. For example, when dealing with online education, the concept of the learning environment needs to be re-examined. There is no longer any physical site where participants gather periodically, but rather a host of different learning environments, each built around an individual remote participant. This situation calls for tools that can monitor what goes on inside these environments, so that the most suitable educational strategy may be put into action.

Clearly, identifying and understanding the elements to evaluate is more complex in distance education, no matter whether they are macro - or general - elements (evaluation of the technology, of the course and materials, of the cost/benefits ratio), or micro - or specific - ones (evaluation of participation, goal achievement, evaluation of individual learning, etc).

Without doubt, there are more elements to take into account in the evaluation of distance education with respect to face-to-face learning. This is due to the greater flexibility of distance education, along with the wider range of stimuli and resources offered to the participants (Thorpe, 1998). Consequently, it is much harder to find criteria by which to evaluate the performance of participants, given the greater freedom they enjoy in determining their own learning path, using the available learning material, participating in online workshops, etc.

What is more, the variables at play increase when ICT (Information and Communication Technology) is used to support and run the course. It is worth remembering that CMC (Computer Mediated Communication) has given an enormous boost to the development of innovative education systems, both by creating new opportunities for ‘traditional’ distance education, and by giving rise to new distance education models based on online collaborative learning strategies. It is the latter development that has had a particularly strong impact on approaches to the evaluation of online courses.

In traditional distance education, the interpersonal communication channel (where one exists) is usually of a one-to-many type (teacher to students) or one-to-one (student to teacher); in most cases evaluation is done via a questionnaire or by assessing student products. By contrast, online courses are largely based on collaborative learning models, where many-to-many communication channels make evaluation possible through observation of participant interaction, collaboration and learning.

The aim of this paper is to describe a particular approach to online course evaluation that has been developed and tested in various environments, from in-service teacher training (Briano *et al*, 1997; Trentin, 1997) to distance training for small and medium-sized enterprises (Trentin, 1996).

Evaluation of Online Education

The factor that distinguishes *third-generation* distance education (online education) from previous forms is that the learning process is social rather than individual (Nipper, 1989). This has been brought about by
the use of computer conferencing systems, which allow the creation of virtual environments that foster interpersonal communication and collaborative learning.

When it comes to deciding the criteria for online course evaluation, most evaluators adopt the same ones used to analyse computer conferencing. This comes as little surprise, given that the learning process in such courses largely takes place within the computer conferencing environment.

Furthermore, because the key element in online courses is participant interaction, course evaluation entails some of the indicators typically adopted for evaluation of face-to-face courses, indicators that are strictly linked to the sociality of the process (participant interaction, tutor-participant interaction, participation and collaboration levels in course activities, etc).

Without doubt, CMC has contributed to the enrichment of distance education processes: interactivity yields benefits for learning and asynchronicity stimulates deeper reflection about contents.

As Kerr and Hiltz (1982) state, computer conferencing encourages cognitive and psycho-social development. Text-based messages call for rigorously organised thinking and considerable coherence, which not only brings cognitive skills into play but also develops metacognitive skills in the management of learning processes (Henri, 1992).

Given the richness and complexity of online courses based on intensive CMC use, their evaluation will inevitably entail very specific characteristics that need to be taken into consideration (Mason, 1992).

**Evaluation through message analysis**

In the view of many experts (Henri, 1992; De Vries *et al.*, 1995), message analysis yields information on areas like the course participants themselves, their learning styles, the strategies they put into practice when tackling problems, and so on. Each message bears particular meaning, both as an individual contribution and in relationship to those of other participants.

Nevertheless, it is not possible to analyse computer conferencing messages using the same criteria adopted for other forms of text. It is for this reason that, for example, France Henri (1992) proposes a particular method for message analysis based on three key elements:

- a *framework* defining the dimension of the analysis;
- an *analytical model* corresponding to each of these dimensions;
- a *technique* for the analysis of message content.

The *framework* comprises five dimensions: participative, social, interactive, cognitive and metacognitive. Each of these is associated to an *analytical model*, as shown in Table 1.

<table>
<thead>
<tr>
<th>dimension</th>
<th>analytical model</th>
</tr>
</thead>
<tbody>
<tr>
<td>participative</td>
<td>This refers to two kinds of quantiative data: the sum total of messages sent by</td>
</tr>
<tr>
<td></td>
<td>all participants, and the number of messages sent by each individual.</td>
</tr>
<tr>
<td>social</td>
<td>This relates to group cohesion and the sense of belonging, i.e. aspects not</td>
</tr>
<tr>
<td></td>
<td>strictly related to conference content.</td>
</tr>
<tr>
<td>interactive</td>
<td>This concerns the way each individual message is linked to and/or generates</td>
</tr>
<tr>
<td></td>
<td>others.</td>
</tr>
<tr>
<td>cognitive</td>
<td>This analyses the ways in which cognitive skills develop during the learning</td>
</tr>
<tr>
<td></td>
<td>process.</td>
</tr>
<tr>
<td>metacognitive</td>
<td>This is divided into metacognitive <em>knowledge</em> and metacognitive <em>skills</em>: the</td>
</tr>
<tr>
<td></td>
<td>former analyses the relationships between knowledge, tasks and strategies</td>
</tr>
<tr>
<td></td>
<td>employed, while the latter examines the capacity to plan, evaluate, reflect, etc.</td>
</tr>
</tbody>
</table>

Table 1 – The dimensions involved in message analysis

**Analysis of individual message content** is conducted at three separate levels: what was said, regarding discussion content; how it was said; and what processes and strategies were adopted dealing with the contents. Obviously, the first level concerns the results of learning, while the second and third relate to the process that generated that results.

It is important to note that Henri’s approach has been and still is accepted by other researchers. De Vries *et al.* (1995) retain these three levels for their analysis of individual message content, but suggest a number of further developments. For example, at the first level of content analysis (what was said) they suggest breaking down each message in the discussion into so-called *units of meaning*. Each *unit of meaning* represents a separate idea or part of information contained in a message, one held to be relevant and correct in relation to the moderator’s question or to the messages sent by other participants. This breakdown is also
used to understand whether participants have correctly followed the discussion path traced out by the tutors or trainers.

The idea of breaking down messages into units of meaning and then dealing with these rather than with whole messages arises from the belief that electronic messages vary considerably in nature: some may contain a single concept, while others convey a wealth of information and ideas.

Many more examples could be given of research into the analysis of computer conferencing communication, but the studies described thus far provide an adequately clear picture. Nevertheless, it ought to be added that while proposals gleaned from previous efforts are undoubtedly useful and scientifically sound, they apply to situations where there are adequate human resources on hand to guarantee meticulous and detailed classification of message content. This is a complex task requiring wide-ranging skills in the areas of classification methods, contents, communication dynamics, etc. In short, classification-based evaluation seems to be feasible mainly at a research level, where scientific interest dominates, there are sufficient human resources on hand and/or purposely-designed tools can be devised.

Such an effort would appear to be beyond the means of bodies operating outside the research sector; classification would demand an inordinately large share of the overall training budget and tutors could not possibly be expected to add it to their already heavy workload. This is the reason why an effort has been made here to outline an evaluation scheme based not so much on sophisticated instruments/procedures for analysing online procedures, but rather on an approach that can be easily integrated into tutors’ normal online activity.

A proposal for monitoring and evaluating online courses

Evaluating online courses poses a series of issues at various levels. Two aspects are of particular significance: the first is evaluation of learning, and the second is evaluation of the participants’ performance, both in terms of time spent online and activities effectively carried out at a distance, either individually or during computer conferencing. Indeed, it is thanks to computer conferencing that online courses have a lot more feedback information to draw on than do traditional distance courses. Consider the possibility of analysing course messages (number and content), automatically compiled log files, and the periodic production required of participants (reports, short essays on the contents of course modules, projects, etc).

Course monitoring is usually assigned to the tutors, who are required to gauge the participation level of individual students and to determine whether (and to what extent) they are getting to grips with the various issues that content experts consider central to a given topic. In addition, course monitoring entails determining to what level collaborative strategies are being employed in task performance.

In our approach, the key elements taken into consideration (in other words what is to be evaluated) are:
• the participants’ individual characteristics (initial competence, expectations, learning, etc);
• the learning environment, in terms of its various components, whether they be local (learning centre, home, etc), virtual (the network), or social;
• the participation dimension (quantitative analysis of the messages exchanged in the computer conference);
• qualitative analysis of messages in terms of content and contribution to collaborative work;
• analysis of communication (interaction dynamics, the relationship between the actions of tutors and experts, teaching and/or operational strategies adopted by tutors and experts, etc);
• learning material used (books, articles, software, etc);
• communication technology (ease of use, effectiveness for online collaboration, etc);
• the return on investment compared with similar face-to-face courses.

Now let us take a look at how and when an online course is to be evaluated according to the approach proposed.

Evaluation framework

The courses referred to in this study are primarily designed for adults. The evaluation process focuses mainly on gauging participation in the various group activities rather than fully fledged (formal) evaluation of learning. It is therefore taken for granted that satisfactory participation (accurately demonstrated by the

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1 Files in which the computer conferencing system automatically records each individual action that participants perform online: reading/writing messages, chatting activity, connection times, etc.
participant’s regular productions and contributions to online activity) will in any case lead to individual learning of course topics.

Verifying learning is an extremely difficult task, all the more so when the course involves a very particular content area such as a methodology. Ideally, it should be done by observing how the participants actually apply their learning in the post-training phase.

**Submission of entry questionnaire**

When running a course of any type, it is essential to start out with a reasonably homogeneous student group, especially in terms of pre-knowledge. And when it comes to online courses, this is particularly true. The course announcement should therefore include clearly defined participation prerequisites to help filter applicants if a selection process proves necessary.

To gain more precise information about applicants, a simple entry questionnaire can be submitted, whose purpose is to provide an outline of the participant profile. In this way, information can be gained about:

- participants’ pre-knowledge and any experience they may have gained in the topic areas covered in the course;
- previous experience in distance/online courses;
- reason for joining the course and expectations;
- participation logistics (learning environment conditions);
- know-how in ICT.

This is a self-evaluation questionnaire, which, as is commonly known, can never be entirely objective no matter how well it is designed. Nevertheless, such a questionnaire often proves to be extremely useful for tutors when carrying out initial course tuning.

One of the most important findings to come out of the entry questionnaire is the nature of the learning environment (physical setting) where the student will participate in the distance course. Indeed, the tutors often need to “picture” the student operating online, studying the course material and working on the tasks that have been set.

**The influence of the learning environment**

Numerous research studies have examined the relationship between learning processes and the environment in which they unfold. Jegede, Fraser and Fisher (1995) defined the **learning environment** as a series of elements that influence (both positively and negatively) the acquisition of new knowledge and skills. These range from the climate created among the participants (students, tutors, experts, etc.) to the physical setting where study is undertaken, and a whole series of other factors that make the individual student's situation unique.

The learning environment has been used as a predictive variable in establishing the relationship between the environment itself and the cognitive and affective results produced. This assumes great importance in online courses, which are based on frequent interaction among all the actors in the process.

Distinguishing between **social interaction** and **individual interaction**, Bates (1991) reveals how in traditional distance education the former tends to smother the latter when it comes to the one-to-one relationship between the individual student and the learning material (guides, books, video recordings, courseware, etc). This situation is reversed where online courses are concerned.

Evaluating learning environments in distance education is therefore a demanding task, especially in view of the range of different conditions that can affect the way individual students participate.

**Monitoring of exercise activities**

Online courses can draw on a range of different educational strategies and it obviously follows that different modes and tools can be employed for monitoring/evaluating student activities.

Where an exercise strategy is adopted, monitoring is chiefly based on evaluating the outcome of those activities. In order to achieve objective evaluation, the exercises must be designed in such a way as to produce a result that is easy to measure, of the kind true/false, found/not found, multiple choice, etc.

**Quantitative monitoring of participation**

During exercise activities, communication between tutors and students is based on a one-to-many channel (tutor-students) for setting tasks and one-to-one (student-tutor) for handing in results and/or seeking help in case of difficulty. But what happens when the activities entail online discussion and collaborative production based on many-to-many interaction?
Clearly, in this case the monitoring process is more complicated than simply verifying whether exercise answers are correct or not. Different strategies are called for, ones based on qualitative/quantitative analysis of messages exchanged in the various conferences and on the participation levels of the whole group.

As to this latter aspect, tutors can use simple grids, analysed automatically using special algorithms, such as those for calculating the participation index (Mackenzie, 1966a) and the centrality index (Mackenzie, 1966b). The purpose of these procedures is to produce a so-called incidence table with sender/receiver (S/R) double entry. This is used to record interactions among participants in a discussion group (Table 2).

<table>
<thead>
<tr>
<th></th>
<th>S 1</th>
<th>S 2</th>
<th>……</th>
<th>Sn</th>
<th>Total R</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1</td>
<td>1</td>
<td></td>
<td></td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>R2</td>
<td>2</td>
<td></td>
<td></td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>……</td>
<td>……</td>
<td>……</td>
<td>……</td>
<td>……</td>
<td>12</td>
</tr>
<tr>
<td>Rn</td>
<td>3</td>
<td>2</td>
<td></td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Total S</td>
<td>15</td>
<td>8</td>
<td>4</td>
<td>11</td>
<td></td>
</tr>
</tbody>
</table>

Table 2 - An incidence table used for calculating the centrality index.

Supposing that there are n students, the table will measure n by n, and each cell will represent the number of times that each participant has interacted with another group member. The sub-totals of each column represent the number of message emissions, and the sub-totals of each row the number of receptions. The table’s overall total represents the number of communications\(^2\) that have taken place within the group.

Applying two different algorithms to the incidence table yields two different values: the centrality and participation indexes. Roughly speaking, the former measures the extent to which communication centres around one or more participants, while the latter gauges the extent of communication distribution within the group.

That said, it must be recognised that although statistical analysis may prove useful in evaluating group dynamics, caution ought to be exercised, and the same goes for similar analysis of log files. In the next section an alternative evaluation approach is presented which, although certainly less scientific, is possibly more practical, especially in view of the complexities already inherent in online tutoring.

The above considerations about monitoring participation in online exercises and conferences hold if, and only if, all the participants are remote from one another and must therefore communicate via ICT. If, however, the student community is organised in a group-of-groups, namely a series of local groups linked up in a network, evaluation needs to be conducted by other means. Indeed, monitoring the performance of individual group members is very difficult in this context, given that observation of online activity is based solely on what is exchanged on the network – in this case the final results of work carried out by the local group as a whole.

The solution to this problem is to set tasks every now and again for virtual groups made up of members from different local groups, who will thus be forced to communicate exclusively online. This is a fairly effective method for singling out the performance of individual local group members. What is more, it is worth remembering that breaking down local groups also serves to create situations in which each member may try his/her hand at computer conferencing and tackle the course contents on an individual basis.

**Qualitative monitoring of participation**

While quantitative analysis of messages can be performed using clearly defined algorithms derived from sociometric techniques, qualitative analysis of online course participation cannot. The problem, it might be said, is one of “quantifying quality” by drawing on analysis of message content. However, this analysis must go beyond verifying whether and how each participant has dealt with the course contents (*Have they tackled the main topics in that particular part of the course?*) to include general observation of learning group performance along the entire study path dedicated to a certain content area (*Was interaction constructive?).*

In a previous section mention was made of the proposals put forward by several researchers for evaluation based on the detailed breakdown and analysis of messages. These methods are particularly interesting but, as already stated, call for expertise not always possessed by the staff running the online course.

\(^2\) The total number of communications does not necessarily correspond to the total number of messages exchanged in the computer conference, given that a message may contain information addressed to more than one receiver.
Recognising both the validity of these methods and the difficulties they pose, it has been decided in the present work to draw on the results of the aforementioned research and develop monitoring tools that are decidedly less sophisticated but perhaps more manageable for tutors.

In their role as facilitators, tutors actually read most of the messages exchanged in the various computer conferences. This gives them a good basis for estimating participation quality both of individual students and of the learning group as a whole.

However, personal impressions do not provide an adequate basis for analysing what is going on. What is more, these impressions can be influenced by the effect of deferred communication, with the result that tutors often feel the need to qualify their observations.

One solution is to prepare a qualitative measurement grid that meets two requirements, namely that it is quick and easy to fill in and is seen by the tutors themselves as a useful tool in their work. These two conditions, however, are not perfectly in line with the idea of a rigorously scientific tool (see those developed by Henri et al) and indeed this grid does not pretend to be one.

Four basic elements have been taken into consideration:
- number of messages sent by each individual student;
- interactivity characteristics of the messages;
- extent to which the message covers the topics that the course experts have identified as significant;
- depth (granularity) to which the topics have been explored.

The first two elements cover participation quality from the viewpoint of presence and interaction with other students (accordingly, they might provide an alternative to the tools described in the previous section). The second two do so from the viewpoint of the contents being studied.

With particular respect to the last point, it has to be said that the list of topics (a sort of check-list) must be compiled during the course design phase by the experts in the subject area (Scimeca & Trentin, 1999).

Compiling a brief progress report

In the evaluation method proposed, participants are expected to send their reference tutor regular progress reports (at the end of each module), briefly stating what they have done and noting any problems they may have encountered during their activities: difficulties in tackling particular topics, technological problems, personal or professional commitments that have prevented course activity for one or more weeks, etc.

This report is aimed at providing the tutoring staff with all the information necessary for calibrating parts of the course, reinforcing them, allowing greater flexibility for individual students, etc. It may have an open format but ideally the structure should be predetermined by the tutor, in the form of a brief questionnaire containing explicit questions on points that the tutoring staff consider important. This can help to avoid disparate reports that are difficult to compare when seeking to get an overview of individual conditions of participation.

The report findings (at least those requiring an opinion expressed on a numerical scale) can be summarised in a table that gives an overview of student responses. An example can be seen below in Table 3.

<table>
<thead>
<tr>
<th></th>
<th>Individual student evaluations expressed on the Likert Scale</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ease in performing the proposed activities</td>
<td>4 4 5 3 ...</td>
<td>3.9</td>
</tr>
<tr>
<td>Activity effectiveness in relation to goals</td>
<td>4 3 4 4 ...</td>
<td>3.7</td>
</tr>
<tr>
<td>Adequacy of conference structuring</td>
<td>5 1 5 3 ...</td>
<td>3.6</td>
</tr>
<tr>
<td>Suitability of group size</td>
<td>5 2 5 3 ...</td>
<td>3.8</td>
</tr>
<tr>
<td>Effectiveness of tutor performance</td>
<td>5 4 2 3 ...</td>
<td>3.9</td>
</tr>
<tr>
<td>Estimated level of participation in course from workplace/school (percentage)</td>
<td>60 100 100 65 ...</td>
<td>75</td>
</tr>
<tr>
<td>Estimated level of participation in course from home (percentage)</td>
<td>40 0 0 35 ...</td>
<td>25</td>
</tr>
</tbody>
</table>

Table 3 – Example of table used for gathering data from progress reports
Group essay production

One of the tasks that the students are often set is to work in small groups and draft short essays summarising the conclusions reached from the activities proposed by the tutors: discussion, reader’s reports, etc. This has a dual aim: firstly to verify the effectiveness of collaborative work (the process that students have set in action), and secondly to gauge the level to which the students have analysed the content area at hand.

The collaboration level can be measured quantitatively and qualitatively using tools of the kind outlined in previous sections of this paper. By contrast, content analysis is usually based on a check-list prepared by the area expert, who suggests to the tutoring staff the topics that students should focus on.

End of stage production

At the conclusion of each stage of the course, a document is produced (either individually or collectively in a sub-group) that summarises what the students have learned. Here again, analysis of the various contributions is performed by referring to a checklist provided by the area expert responsible for the design of that particular stage. When the expert is available to do so, it is he/she who carries out analysis of the students’ essays.

Development of a final project

The proposed framework is chiefly suited to project-based courses, namely those based on design activities performed in unison with the acquisition of course contents. In a way, it might be said that while end-of-stage production represents a summary of a part of the course, production of the final project can be seen as the practical application of everything that has been studied during the course. In this light, the project can be viewed as a sort of currency that can be “spent” as soon as the course has finished.

Let us take an example from an actual distance course. The participants in courses we have run regarding educational use of ICT developed a collaborative educational project involving their respective schools; this project was subsequently put into practice when the online course concluded.

Final questionnaire

The purpose of the final questionnaire is to gather and examine the views of individual participants about their participation in the course. The questions cover:

- course contents;
- the educational approach adopted in the course;
- correspondence between expectations and results reached;
- materials used;
- organisational aspects of course activities;
- participation modalities (logistics) of individual students;
- technical aspects related to the use of the net and the suggested technologies;
- performance of both tutors and area experts in their various roles (as moderators, facilitators, activity leaders, trainers, etc).

This questionnaire can also be used as the agenda for final debriefing at a face-to-face meeting held at the conclusion of the course (where such a meeting is possible). New and unexpected factors regarding course participation often come to light at such events.

Course participation file card

When monitoring is completed, a personal file card is compiled for each participant containing information about materials produced, the number of messages sent in each conference, and an assessment of his/her performance given both by the personal tutor (the person who follows the participant throughout the course) and the conference tutor (the reference tutor for a particular course activity).

The file card is helpful where there is to be a summative evaluation of the course, i.e. an assessment of each participants’ performance throughout the course.

Observation of participants during placement

In our model, evaluation does not finish at the conclusion of the course, but continues with the trainees’ immediate post-course application of their new knowledge in their respective professional fields. This
placement stage offers a second opportunity to verify what the students have effectively learnt as they put their training into action.

Post-course evaluation is crucial when the course contents are of a methodological nature, as any assessment undertaken up to that point only gauges the level of comprehension and not the capacity to transfer that learning to one's own workplace.

Conclusions

In this paper, a framework has been proposed for the evaluation of online courses, focusing on the following aspects (what to evaluate):

- participants’ individual characteristics;
- the participative dimension;
- message analysis and evaluation from the viewpoints of contents and of collaborative work;
- analysis of interpersonal communication;
- effectiveness of the support offered by tutors and experts;
- participants’ reaction to the methodological approach adopted for running the course;
- quality of the learning material;
- the learning environment in all its forms – local, virtual, social, etc;
- communication technology;
- return on investment compared with similar face-to-face courses (Trentin, 1999).

On the basis of these points, a proposal has also been made regarding how and when to carry out evaluation. This is summarised in Table 4, where each assessment goal is coupled with the corresponding mode of operation for evaluation.

<table>
<thead>
<tr>
<th>operation modality</th>
<th>aim</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 submission of entry questionnaire</td>
<td>gauge:</td>
</tr>
<tr>
<td></td>
<td>• pre-knowledge and any previous experience in the topic area participants might bring to the course;</td>
</tr>
<tr>
<td></td>
<td>• reason for enrolling and expectations;</td>
</tr>
<tr>
<td></td>
<td>• each participant's learning environment;</td>
</tr>
<tr>
<td></td>
<td>• ICT know-how</td>
</tr>
<tr>
<td>2 monitoring of exercises</td>
<td>verify the outcome of exercises undertaken</td>
</tr>
<tr>
<td>3 monitoring of computer conferences</td>
<td>verify participation in discussions and contribution to collaborative activities</td>
</tr>
<tr>
<td>4 request for brief progress reports</td>
<td>bring to tutors’ attention any useful information for calibrating or reinforcing parts of the course, etc.</td>
</tr>
<tr>
<td>5 request for group production</td>
<td>verify effectiveness of collaborative work</td>
</tr>
<tr>
<td>6 request for individual essays at</td>
<td>verify the extent of content acquisition</td>
</tr>
<tr>
<td>the end of course modules</td>
<td></td>
</tr>
<tr>
<td>7 request for final project</td>
<td>verify the capacity to apply all the knowledge imparted within the course</td>
</tr>
<tr>
<td>8 submission of a final questionnaire</td>
<td>request for views on:</td>
</tr>
<tr>
<td></td>
<td>• interest in course contents;</td>
</tr>
<tr>
<td></td>
<td>• educational approach adopted;</td>
</tr>
<tr>
<td></td>
<td>• correspondence between expectations and results achieved;</td>
</tr>
<tr>
<td></td>
<td>• learning material used;</td>
</tr>
<tr>
<td></td>
<td>• organisation of activities;</td>
</tr>
<tr>
<td></td>
<td>• individual students’ participation modalities (logistics);</td>
</tr>
<tr>
<td></td>
<td>• technical aspects related to networking and use of the suggested technologies;</td>
</tr>
<tr>
<td></td>
<td>• performance of both tutors and area experts in their various roles</td>
</tr>
<tr>
<td>9 observation of placement phase</td>
<td>verify the capacity to transfer knowledge and skills acquired in the course within one’s own professional field</td>
</tr>
</tbody>
</table>
In conclusion, let us take a look at how the proposed pathway fits into the broader problem of evaluating the success of a learning process. Given the strong agreement between Kirkpatrick (1975) and the proposal made in this paper, his work will be adopted as the reference point. Accordingly, each of the four levels in Kirkpatrick will be matched with the various steps in our methodology.

**Reaction and planned action** – this means gauging the participants’ satisfaction and studying how they intend to apply what has been learnt during the course. In our case, this corresponds to the phases of intermediate and final course evaluation (progress reports and final questionnaire gauging satisfaction/self-evaluation).

However important satisfaction levels may be, they are no guarantee that the knowledge and/or skills that the course was designed to impart have actually been learnt.

**Learning** – this reveals what the participant has learnt from the course, which can be measured in a variety of ways: for example, using tests, practical activities (e.g. designing), role plays, simulations, assessment, etc. In our model, this corresponds to individual or group essay writing and to development of application projects.

However, positive outcomes at this point still do not guarantee that the course participants are actually capable of applying correctly what they have learnt. The enormous gap between knowledge and know-how is all too evident.

**Workplace application** – there are numerous methods for measuring the so-called follow-up, i.e. whether and how the participants apply what they have learnt in their respective jobs. These are usually based on observation of the frequency and way in which the newly acquired knowledge and skills are applied. In our case, this is implicit in the post-course placement phase.

But even if the evaluation yields positive results, there is still no guarantee that the organisation to which the course participant belongs will enjoy equally positive benefits.

**Business results** – the benefit gained by the organisation can be seen from different angles: in economic terms; from the viewpoint of customer satisfaction with the service offered (by a company, institution, training body, etc); in terms of the production costs; and so on.

In our model, this last level corresponds to placement stage evaluation of the benefits gained by the participant’s organisation through the trainee’s application of his/her newly acquired knowledge.

Among the advantages to be gained from breaking down these four levels is the opportunity for reflection about the return on investment (ROI) of online courses (Phillips. 1998). Obviously, ROI estimation cannot be carried out without careful evaluation of the previous four levels. This means that before proceeding with ROI estimation, it is first necessary to evaluate how the knowledge and skills acquired in the training course (level 2) are applied in the workplace (level 3), yielding a positive impact on the participant’s organisation (level 4). Unless these measures are carried out, it is extremely difficult to claim that the results gained really are the fruit of the training course in question, and that they effectively represent the ROI.

**References**


