

Chapter 9

Evaluation of e-learning activities in hospitals

Birgit Zens

1. Reasons for conducting evaluations

Evaluations are conducted in order to assess and to improve the quality and effectiveness of programmes, in our case e-learning curricula in hospitals. Evaluations can accompany the planning, development, and implementation of a given curriculum and are an important decision making instrument for those responsible for the programme and for upper-level decision makers, such as the management of a hospital and those who decide upon financial resources and personnel.

Fig. 1 presents an illustration of the circle of planning, developing, and implementation of curricula and the role of evaluations in this process.

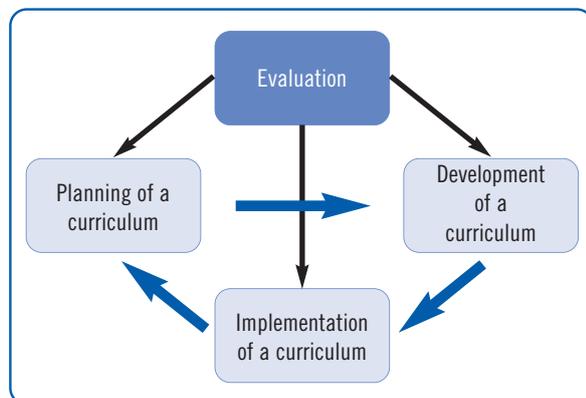


Fig. 1: The role of evaluations for planning, developing, and implementation of curricula

2. The four main steps of planning an evaluation

When planning an evaluation, the first and crucial step is to concrete and specify the **goals of a given course** and define tangible **evaluation objectives**. It is essential that this step is done in collaboration with those responsible for the programme. When defining the evaluation goals the information needs of the involved parties and the subsequent use of the results need to be taken into account.

Dependent on the objectives of a given evaluation, one has to determine the **evaluation design** and decide on a point in time when the evaluation should be conducted. Will the evaluation be conducted prior to the implementation of a curriculum, concomitant, or after termination of a course?

The next step is to select the **target groups** of the evaluation. Who will provide information for the evaluation? Will the participants of the course? Will the hospital staff? Will the trainers? Generally, in order to ensure the validity of the data different target groups should be taken into account.

After deciding which target groups to focus, one selects the **methods** for the evaluation, e.g., interviews, questionnaires, or tests. The methods must be appropriate for answering the evaluation questions. What kind of information do the users of the evaluation results need? Do they need detailed insights based on verbal data, or do they need quantified figures? Limitations of financial resources and available time must also be considered. Finally, one develops the **evaluation instruments**, or selects existing instruments. Quite often, such instruments need to be adapted for their intended use. The selection, adaptation, and development of the instruments are crucial for the quality of the data. Hence, this step must be prepared carefully and accurately.

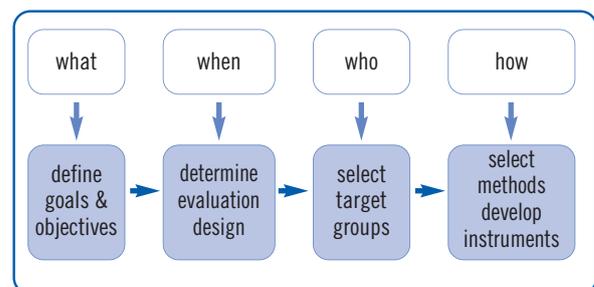


Fig. 2: The four main steps of planning an evaluation

3. Defining goals: four golden rules

The purpose of an evaluation is to assess the quality and effectiveness of a given programme. The challenge is how to approach and execute this essential task. When are we in the position to state that the quality of a programme is satisfactory? When are we able to state with confidence that a programme has proven itself to be effective? Therefore, specifying tangible goals and objectives is a crucial step in planning an evaluation.

Evaluations should answer tangible questions

Frequently, evaluators face the situation that programme developers have only vague ideas about what they actually

intend to achieve and which aspects exactly should be evaluated. Thus, an essential first step for evaluators is to define tangible programme goals in conjunction with all parties involved in the programme development. Based on these goals, the objectives of the given evaluation should be specified. A highly recommended method is to organise a joint workshop in order to discuss and subsequently specify the information needs of the involved parties.

Evaluations should target the information-needs of the user

The concrete evaluation goals should be specified in conjunction with all parties concerned as the information needs may differ. What does, for instance, effectiveness mean to the developers of a programme? What does effectiveness mean for the management of a hospital or a financial sponsor? There are several perspectives and concrete informational needs that must be clarified prior to planning the evaluation.

Evaluations should consider the subsequent use of the results

When planning an evaluation, it is also essential to take into account the subsequent use of the results. Will the results of the evaluation be used to improve the programme? Will the results of the evaluation be used to provide information on whether to continue a programme? Or, is it the goal of the evaluation to justify the incurring expenditures? Depending on the purpose of the evaluation, the tangible goals will differ:

- Will the evaluation be used to improve a programme?
- Will the evaluation be used to justify the incurring expenditures?
- Will the evaluation be used to determine whether to continue a programme?

Evaluations should be feasible

Another important aspect to consider is the feasibility of a given evaluation. The effort of the involved parties in the evaluation must be appropriate in relation to the anticipated utility. The estimated cost-benefit ratio should be adequate. With regards to costs, it is frequently necessary to compromise on a comprehensive and systematic data collection and to reduce the scope of the evaluation.

4. When to conduct the evaluation: the evaluation design

Depending on the goals and objectives, evaluations are conducted at different points in time. To improve the development of an e-learning curriculum, an *ex ante evaluation* is recommendable. This kind of evaluation is performed in order to assess the needs of the target group prior to the

development and implementation of the given course. The needs of the target group for e-learning curricula in hospitals are, e.g., the requirements of the patients, their physical and psychological conditions, their motivation for learning and their content-related needs. An example of a detailed checklist is presented below.

During the implementation of the course, a *concomitant evaluation* is useful to collect intermediate results and to reveal unexpected problems. The results of a concomitant evaluation are directly used for improving the running implementation of the course. An *ex post evaluation* assesses the effectiveness of the given course. In particular, if the purpose of the evaluation is to justify the programme and its expenditures, or to decide on whether to continue the programme, an ex post evaluation is required. The results of an ex post evaluation can also be used to improve the subsequent implementation of the given course.

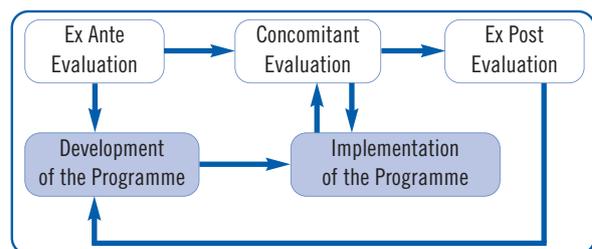


Fig. 3: Conjunction of evaluation and programme development

5. What and when to evaluate

Assessing the patients' needs and the conditions in the hospital prior to the development and implementation of an e-learning curriculum, assessing the needs of the target group is important, e.g., the requirements of the patients, their physical and psychological conditions, their motivation for learning and their content-related needs.

Moreover, the conditions in the hospital are crucial for the delivery and success of e-learning courses and have to be considered carefully in the run-up to programme development and implementation.

A checklist for the ex-ante assessment of an e-learning project in the preparatory phase has been presented in Chapter 6.

Assessing the patients' computer skills

To achieve a high level of satisfaction of the participants and successful course completion, the course requirements should be adapted to the patients' level of computer skills. Example questions assessing the patients' computer experience are presented in the following box:

Assessment sheet of participants' computer skills

In general, how often do you use a computer?

- Every day
- Several times a week
- Once a week
- More than once a month
- Less than once a month
- Never

What do you use the computer for (e.g. word processing, games, e-mail, searching for information, downloading music, etc.)?

	Not at all	Insufficiently	Somewhat	Sufficiently	Very confident
How confident do you feel about using a computer?	<input type="radio"/>				
How confident do you feel about using the Internet?	<input type="radio"/>				

Tick any of the following you are sure you can do

- Use a word processing tool (e.g. MS Word)
- Save a file
- Print out a file
- Switch between application windows
- Use a scroll bar
- Search the Internet
- Read, write, and send e-mails
- Send an e-mail with attachment
- Write an entry in a discussion forum

Questions for assessing and improving the quality of a course³⁴

- To what extent does the subject content meet the needs of those attending?
- Is the leader the one best qualified to teach?
- Does the leader use the most effective methods for maintaining interest and teaching the desired knowledge and skills?
- Are the facilities satisfactory?
- Are the aids effective in improving communication and maintaining interest?
- Was the coordination of the programme satisfactory?
- What else can be done to improve the programme?

Assessing and improving the quality of an e-learning course

To gain information on how to improve a running curriculum, one conducts the evaluation concomitant to the implementation of the course. The purpose of a concomitant evaluation is the direct use of the evaluation results for improving the quality of the running course. Hence, it is important that the evaluation results of concomitant evaluations are available rapidly after the data collection. Questions for assessing and improving the quality of a course are presented below.

Assessing the effectiveness of an e-learning course

The evaluation of the effectiveness of a given learning activity is done after termination of a course. Therefore, one first has to define which results one wants to achieve. Depending on the target group of a programme, the desired results differ. By and large, we can summarize the results on four levels:

1. Distraction from health problems, i.e., direct the patients to something useful
2. Support of psychological well-being
3. Decrease of social isolation
4. Acquisition of new knowledge and skills

For example, a programme for Alzheimer's patients will focus on the first and second level, while a programme for Burnout patients or patients with cancer might aim at all four levels. Hence, the first step when evaluating the effectiveness of a programme is to consider which results are desired. Depending on the concrete objectives, the applied methods and instruments differ.

³⁴ Kirkpatrick, D. L. & Kirkpatrick, J. D. (2006). Evaluating Training Programmes: The Four Levels. San Francisco.

6. Target groups

In most cases, evaluations of learning activities focus on the feedback of the *participants*. Without doubt, the reactions of the participants are very valuable and important for assessing the satisfaction with the course. Satisfaction is salient as it is the basis for successful learning. Subjective assessment of benefit is also valuable. Obviously, no one else than the participants themselves can provide better information on the personal benefit derived from the programme.

However, evaluations should not only focus on the patients' reactions, but also take into account other target groups. Generally, taking into account different target groups is a highly recommended method for ensuring the validity of the data.

The *hospital staff* involved in the care of the patients is a valuable source of information. For example, nurses, doctors, hospital psychologists, and all hospital staff concerned with the care of the given patient should be involved. The hospital staff can also provide valuable information on the implementation process of the programme and on the communication and cooperation among the parties concerned.

Trainers, facilitators, or tutors of the learning activity also provide information about the learning progress of the participants, their learning outcomes, and the obstacles and challenges that had to be faced.

Those responsible for the management of the implementation of the programme will provide valuable information on the entire process of programme implementation, the management of the programme, and the communication and cooperation of all parties involved.

7. Methods and instruments

Feedback by the patients

In most cases, evaluations of learning activities only use so-called *reaction sheets* or satisfaction sheets that are completed by the participants after termination of the course. These reaction sheets are very valuable for collecting information about the satisfaction of the participants with the course, e.g. its schedule, content, or satisfaction with the trainers. An example of a reaction sheet for the participants is presented below.

Reaction sheets should always contain *closed and open questions*. Closed questions can easily be analyzed using computerized statistical data analysis. In contrast, the analysis of open questions is time-consuming, as the verbal data has to be adequately summarized (e.g. using categories). Nevertheless, the gathering of verbal data is essential for obtaining in-depth information.

With some groups of patients, however, it is difficult or even impossible to work with written evaluation forms. In such

cases, written feedback needs to be substituted by *face-to-face interviews*.

Feedback from trainers and hospital staff

Reactions of the participants are salient; however, they provide limited information. Thus, the evaluation should not only focus on the patients' reactions, but also include other target groups such as trainers and the hospital staff.

Depending on the availability and time resources of the hospital staff, *questionnaires* or *interviews* may be used. Interviews provide valuable and comprehensive in-depth information. Interviews are the favourite method for discovering unexpected positive or negative effects of the programme and for becoming aware of unforeseen problems, challenges, and obstacles. Determining standardized guiding questions is useful and recommendable for focussing the interview on the questions of interest. However, it is important not to reduce the interview to a question and answer session, but to encourage narratives of the interviewees while maintaining the focus of the interview.

Whenever possible, interviews should be recorded on audio tape, transcribed and subsequently analyzed by summarizing or categorizing the responses. If the interview cannot be recorded, at the very least a third person is needed to take comprehensive notes for subsequent analysis. Hence, conducting and analyzing interviews is time consuming and thus more cost-intensive than closed questionnaires and short verbal feedback sheets.

In the following boxes, you find examples of questions for trainers and hospital staff.

Examples of questions for trainers

- How do you assess the communication and cooperation with the hospital staff / programme members / other parties involved in the project?
- Were the learners encouraged by the hospital staff to participate in the course? If so, in what way?
- Was the infrastructure in the hospital satisfactory (technical, organizational)? Did the participants have easy access to computers and Internet in the hospital?
- Were there any problems with hardware or software?
- How would you describe the participant's motivation in general?
- Are you satisfied with their learning progress and learning outcomes?
- How do you rate the benefit for the patients?
- Were there any obstacles or difficulties due to the participants' state of health? If so, of what kind?

Patients' Feedback Sheet

	Not at all	Insufficiently	Somewhat	Sufficiently	Completely
Did the course meet your needs?	<input type="radio"/>				
Did the course help you to gain new knowledge or skills?	<input type="radio"/>				
Did you benefit personally by taking part in the course?	<input type="radio"/>				

Please specify in what way you benefited from the course:

	Not at all	Insufficiently	Somewhat	Sufficiently	Completely
Did you enjoy taking part in the course?	<input type="radio"/>				
Do you think it is beneficial to learn while in hospital?	<input type="radio"/>				

Were the following aspects beneficial?

	Not at all	Insufficiently	Somewhat	Sufficiently	Completely
Presentation / explanation by the trainer(s)	<input type="radio"/>				
Coaching by the trainer(s)	<input type="radio"/>				
Peer-to-peer discussion online (e.g. discussion forum, chat)	<input type="radio"/>				
Peer-to-peer discussion face-to-face	<input type="radio"/>				
Assignments	<input type="radio"/>				
Materials	<input type="radio"/>				
Other elements	<input type="radio"/>				

Comments

	Weak	Satisfactory	Good	Very good
How do you rate the schedule of the course?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Comments

What would have improved the course?

Examples of questions for hospital staff

- How do you assess the communication between the hospital staff and the programme managers / trainers / other parties involved work?
- Were the learners encouraged by the hospital staff to participate in the course? If so, in what way?
- Was the infrastructure in the hospital satisfactory (technical, organizational)? Did the participants have easy access to computers and Internet in the hospital?
- How would you rate the benefit for the patients / for the hospital?
- Do you perceive any problems and challenges regarding the use of e-learning in hospital?

Psychological tests

For the target group patients in hospitals, psychological health-related aspects play an important role. In some cases, one wants to know more about the psychological well-being of the patients and whether this improved over time. Therefore, psychological tests are an appropriate instrument. Psychological tests assess latent psychological potentials of individuals, clinical syndromes (e.g. depression), or attitudes. However, one has to consider that administering and interpreting psychological tests are the domain of trained psychologists.

A well-known and well-tested example of a psychological test is the **SF-36 Health Survey**, or its short form, the **SF-12**. The SF-36 (or its improved version SF-36v2) is a 36-item survey and measures eight domains of health, which are based on the two factors *physical health* and *mental health*.

Health Domain	Items SF-36	Items SF-12	Factor
• Physical functioning	10 Items	2 Items	Physical Health
• Role limitations due to physical health (role-physical)	4 Items	2 Items	
• Bodily pain	2 Items	1 Item	
• General health perceptions	5 Items	1 Item	
• Vitality	4 Items	1 Item	Mental Health
• Social functioning	2 Items	1 Item	
• Role limitations due to emotional problems (role-emotional)	3 Items	2 Items	
• Mental health	5 Items	2 Items	
• Self-reported health transition	1 Item		

Fig. 4: SF-36 and SF-12 – Health Domains

The survey has been adapted for the use in more than 60 languages and can be self-administered to persons ages 14 and older. The SF-12 (or its improved version SF-12v2) is a 12-item subset of the SF-36 and measures the same eight domains of health. Because of its brevity, the SF-12 is frequently used as a screening tool.

The SF-36 and SF-12 survey includes general norms for the US population, by sex and age group, and norms for several clinical syndromes and diseases. As the survey is very sensitive to change, it can be used as a pre and post measure of change after an intervention, e.g. to measure the impact of an e-learning course in hospital. For interpreting the results, both the single scales (domains of health) and the summary measures of physical and mental health can be used. When interpreting single scales, preferably, the SF-36 should be used.

The survey can be obtained from <http://www.qualitymetric.com/>. Specific scoring software for easy interpretation is also available.

Chapter 10

Success factors of informal e-learning for hospital patients

Holger Bienzle

As already stated in the *Introduction* this publication does not claim to pave a safe way to successful e-learning programmes in hospitals. For doing so the basis of experience gained in one European pilot project is by far not sufficient. Having stressed this, however, the eHospital experience highlights ten key factors to successful e-learning projects in hospital. Some of them confirm already published, more general findings with regard to blended learning³⁵, and put them into the specific educational context of this publication.

1. Commitment of the institutions involved

If informal e-learning is to be introduced in European hospitals, it will in most cases be jointly provided by a partnership of education provider and hospital. It is essential that this partnership is not only based on the acting professionals, but on a clear commitment of both institutions involved. With a view of the high work pressure in hospitals it is highly recommendable that the commitment to patient learning is fixed in a bilateral contract signed by the top management, which ensures sure that the necessary resources, especially staff time, will be provided.

2. Performance of a multi-player team

Planning and implementing e-learning in hospitals requires smooth cooperation within a team of experts with complementary expertise: education professionals are needed as well as technical staff, managers and, most importantly, healthcare professionals who are in daily contact with the patients. It is crucial to define precise roles and tasks of these professionals and to plan their interaction for the benefit of the patient learners.

3. Integration into hospital routine

Learning is certainly not a core activity of hospitals, which are designed for other purposes and therefore developed processes and regulations which are not always supportive of e-learning activities. Any newly introduced learning programme needs to acquire a basic knowledge and understanding of how hospitals function and seek to integrate the learning activities into existing routines rather than try to change them.

³⁵ Baume, M.; Hummel, S.; Krcmar, H. (2004). Factors for Success for Blended Learning – Concepts. Experiences gained in the evaluation of Webtrain: [http://www.winbase.de/lehrstuhl/publikat.nsf/intern01/7E2D04A6544CE5D0C1256F5500497087/\\$FILE/04-17.pdf](http://www.winbase.de/lehrstuhl/publikat.nsf/intern01/7E2D04A6544CE5D0C1256F5500497087/$FILE/04-17.pdf), and Scholze, T. (2005) The Role of e-Learning for Training in Institutions of The Third Sector, http://www.elearningeuropa.info/directory/index.php?page=doc&doc_id=5992&doclng=6