

# EFFICIENT ELEARNING COURSE DESIGN AND MEDIA PRODUCTION

Claudia Bremer<sup>1</sup>

<sup>1</sup>*studiumdigitale, Goethe-University Frankfurt, Germany  
bremer@studiumdigitale.uni-frankfurt.de*

## Abstract

AKUE is developed by the e-learning centre of the University of Frankfurt, studiumdigitale, and is a procedure to assure high quality levels of e-learning course design and digital media production. The name AKUE stands for the German words for analysis, concept, implementation and evaluation and describes the four phases of the process. Background of AKUE is the fact, that costs and benefits of e-learning courses are difficult to be quantified. Therefore so called procedure (or process) models are applied in order to improve the quality and effectiveness of e-learning courses. This paper presents the process and steps of AKUE and gives examples for its application.

Keywords: e-learning, course design, media production, efficiency, input-output considerations

## 1 INTRODUCTION: THE PROBLEM OF COSTS AND BENEFIT ANALYSIS CONCERNING E-LEARNING

The implementation of e-learning into an organisation causes costs, time and effort. Costs are generated through the planning process, media production, training of teachers, and organisational changes. Therefore it is more that important to consider costs and benefits in a profound way. Unfortunately both aspects are often difficult to be accessed [1]. While costs might still be allocated and quantified, benefits are often difficult to be measured. They range from direct savings such as cost reductions for travelling up to improvements of reputation and profile, or reaching out to new target groups and markets.

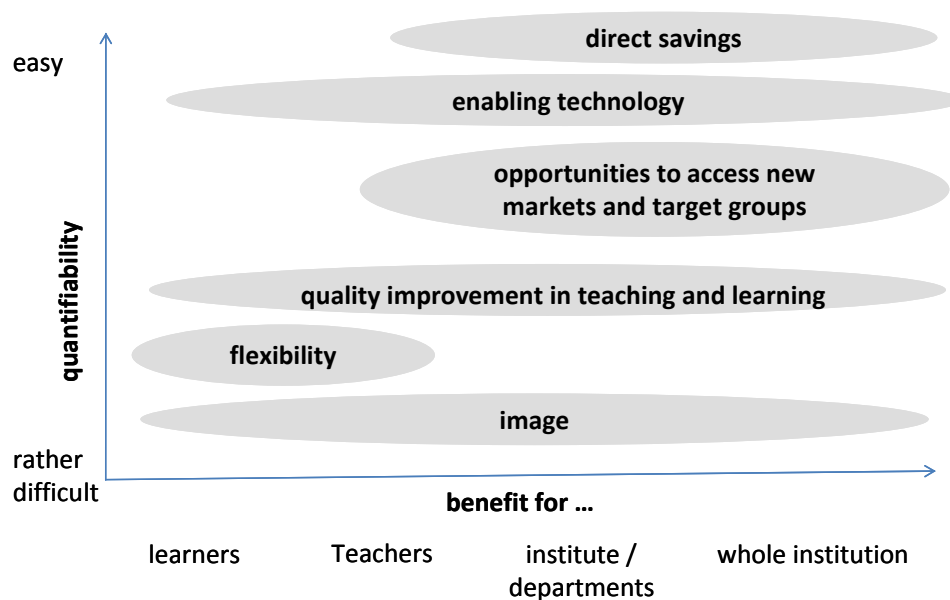


Fig. 1: Overview over potential benefits of e-learning and their quantifiability at different institutional levels

Until now, profound cost-benefit analysis of e-learning are often not established at universities. Observations and studies at the University of Frankfurt showed that e-learning had an overall positive effect on the evaluation results. But problems arise when we want to draw conclusions about the direction of the underlying causality: does e-learning truly improve the evaluation results or do teachers who are innovative in teaching anyway integrate e-learning elements into their teachings? Maybe they would be evaluated positively also without their e-learning elements. Positive results in their evaluation might be caused by their general care about teaching and not by the integration of e-learning. Therefore those results are difficult to be measured and more so to be explained properly.

One problem that arises besides the quantifiability is the allocation of costs and benefits on different levels. While benefits such as improvement of the quality in teaching and learning might occur on the level of a single lecture or department, the costs often have to be allocated at a central level such as an e-learning centre or the institution in total. Therefore decisions such as the establishment of an e-learning centre or central technical infrastructure can be justified by pure economic considerations: it is more than inefficient to run a learning management system at the level of each department. Here, more centralised solutions are just economically reasonable. At the same time the qualification of teachers to tutor online groups and to design e-learning courses might be more than appropriate on a decentralised level in order to foster as much e-learning courses and improvements in teaching and learning as possible [2].

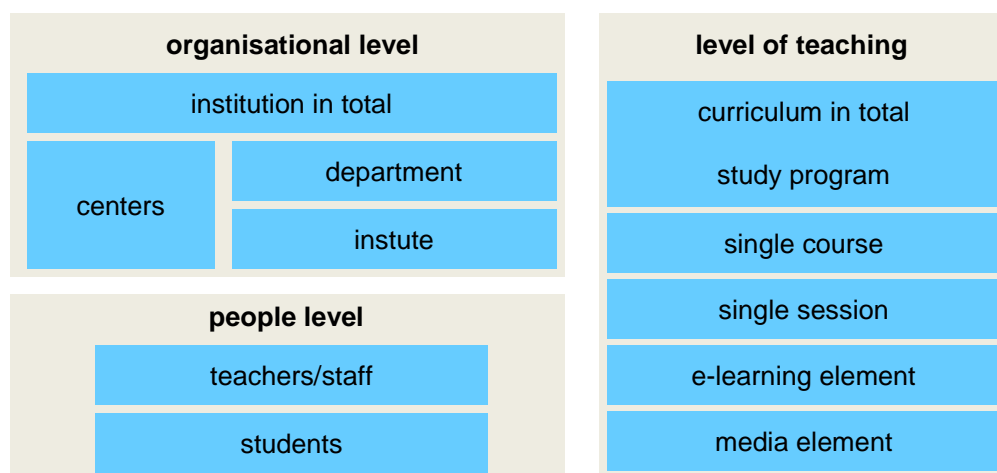


Fig. 2: levels of cost-benefit considerations

The problem with the non-quantifiability of benefits can be solved by assessing the benefits through user inquiries. Users can allocate benefit measure or values to outcomes and rank possible results. They are asked questions such as “What is most important to you?” or “What is more important to you?”. Sometimes they might have to rank options or make a choice between different options [3].

Another solution for this problem is an effectiveness analysis [4]. Here first the desired outcomes need to be defined and finally results are measured in relation to these targets. In a detailed process outcomes can be defined at different levels along with mile stones and time tables. At the end, at each mile stone the performance is measured and gives hints about possible disturbances and failures. Examples for those mile stones in e-learning projects could be: number of students reached, reduction of failure quotas, improvement of tutoring, cost reduction, and so on [5].

AKUE tries to address just this problem: how to guarantee high quality standards for e-learning projects while cost-benefit analysis is difficult.

## 2 THE AKUE PROCEDURE

AKUE which is developed by the e-learning centre of the University of Frankfurt, studiumdigitale, tries to discover potential disturbances and failures along the planning, implementation and evaluation process of e-learning as early as possible. It aims at a high quality, cost efficient course design and media production process but it can also be used for organisational development processes.

AKUE is structured in four different phases, each of them addresses certain issues. Before the process goes on to the next stage, all developed outcomes are evaluated and looked at with the client. This ensures very high quality at each level and defines clear outcomes and standards before the next step is done. At each stage the client must agree to the defined outcomes before the next phase is started.

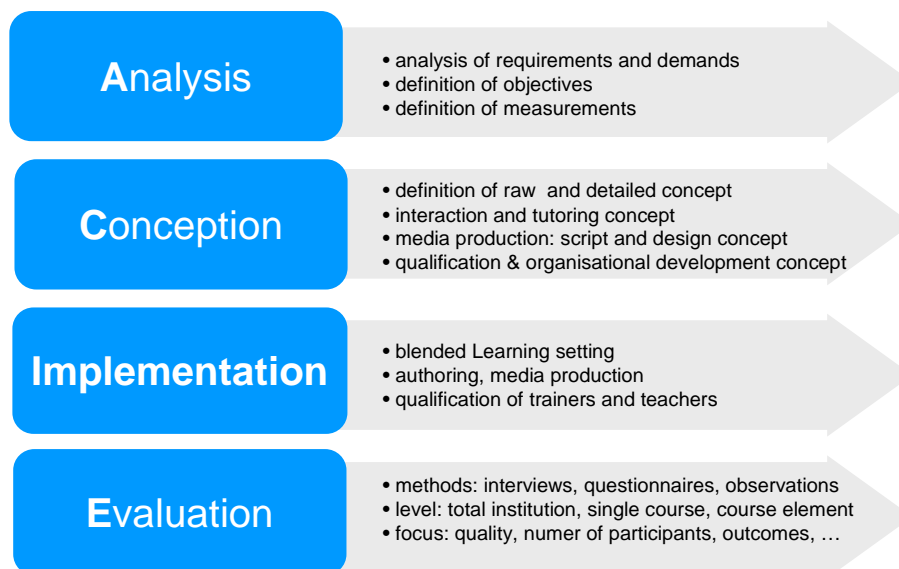


Fig. 3: AKUE phases

First of all, AKUE starts with an analysis phase. Here, the intended outcomes are looked at, the objectives of the project and a first set of measurements are defined. Frequently this process is conducted in cooperation with the client. At this stage the outcomes are defined at the different organisational levels as defined in figure 2. Also the type of project is decided upon: Is it an organisational development project? Is it a media production project? Or a qualification project? Sometimes a project combines several of these issues.

In the conception phase, in case of an organisational development project measurements are defined such as workshops, consulting sessions, milestones, organisational adjustments, steps of re-organisation, and so on. For example results could be the implementation of an e-learning centre or a comparable support structure, decisions upon outsourcing or the introduction of new roles and functions, or job routines. In more didactical projects this stage focuses on the e-learning course design, the training of teachers, or the production of content. In case of a media production process the steps raw concept, detailed concept and script are applied before programming takes place and the implementation phase starts. Figure 4 and table 1 show the structure for a raw concept [6]:

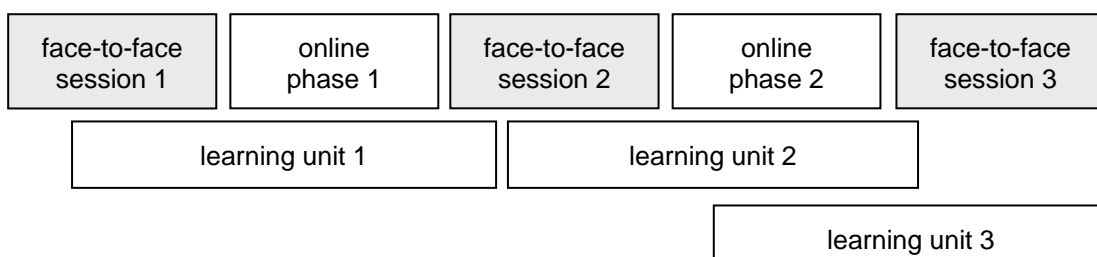


Fig. 4: raw concept for course structure

Table 1: Structure for raw concept

Number of learning unit (LU)	Duration/ Date	online/ face-to-face	learning objectives	subject	methods & social setting	media	workload learners	tutoring tasks	tutoring work load
LU 1		f-2-f session 1							
		online phase 1							
		f-2-f session 2							
LU 2		f-2-f session 2							
		online phase 2							
		f-2-f session 3							

With this table, trainers plan their blended learning and e-learning settings and get feedback from experts. Before the detailed concept is started, trainers and e-learning experts (consultants) agree upon the defined raw concept. In the next step, the detailed concept is defined. Here, planning for media production is started on a very broad level. The detailed concept defines content, type and number of pages i.e. for a web based training (see Table 2):

Table 2: Structure for detailed concept

Number of learning unit (LU)	title	learning objectives	content description	type of page	number of pages	learning time	media types included/ coments

These forms are designed in accordance to a specific authoring tool studiumdigitale uses, but could be adapted to any other tools as well. Finally, the detailed concept gets transferred into a script for the media production process (see figure 5).

The next phase, the implementation, is divided into two sub-phases: preparation and the implementation itself. In the preparation phase, content is produced, courses are prepared, trainers are qualified and technical infrastructure is installed. The real implementation takes place afterwards when the online courses are running. At each step, quality assurance takes place not only through testing, but also through feedback with the client between each phase:

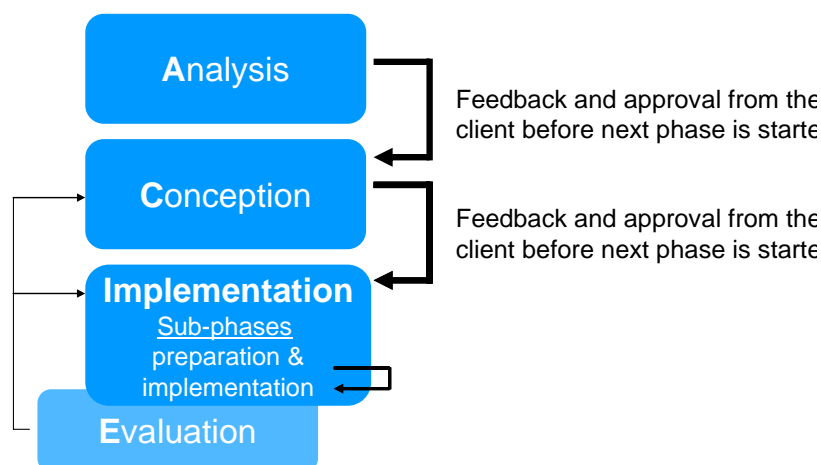


Fig. 4: raw concept for course structure


<p>Projekt: MPS-Online                  Drehbuch: Wertstromanalyse                  Lerneinheit: 1. Einführung                  Version: 1.9                  Datum: 23.10.2007                  Autor: Jannis Bandorski                  Bearbeitet von: Gise Ruprecht, 10.11.2007, Panian 09.11.07</p>		<p>Seitenindex: 01.01.00                  Seitentyp: Inhalt  <b>Browser-Kopfzeile: Wertstromanalyse</b>                  Metadaten: Einführung                  Template: A2</p>
<p><b>Wertstromanalyse</b></p>		
	<p><b>Wertstromanalyse</b>                  Die Wertstromanalyse (WSA) ist eine Methode zur transparenten Darstellung von Material- und Informationsflüssen sowie dazugehöriger Prozessinformationen.                  Auf den folgenden Seiten werden Sie mit den Grundlagen der Wertstromanalyse vertraut gemacht. Sie werden dazu befähigt, Prozesse, Material- und Informationsflüsse in Form eines Wertstroms darzustellen. Verschwendung und Schwachstellen im Prozess können auf diese Weise identifiziert werden, um im darauf folgenden Wertstromdesign die Wertschöpfung zu erhöhen und Verschwendung zu beseitigen.</p>	<p><b>Lernziele</b>                  Am Ende dieses Trainings werden Sie</p> <ul style="list-style-type: none"> <li>- Kunden-/Lieferantenbeziehungen</li> <li>- Prozessschritte</li> <li>- Bestände</li> <li>- Materialflüsse und die zugehörigen Informationsflüsse</li> <li>- Produktionsdurchlaufzeiten</li> </ul> <p>... erkennen/berechnen und als Wertstromdarstellung skizzieren sowie die erforderlichen Daten aufnehmen können.</p> <p><b>Voraussetzungen</b>                  Grundverständnis der in der WSA verwendeten Symbole</p>
<p>Sounds:</p> <p>Sprechertext:</p> <p>Anmerkungen:</p>	<p>Navigation: STANDARD – ohne Einschränkungen</p> <p>Ablauf: NORMAL – Alles sofort zeigen, VIDEO mit eigenem Menü</p> <p>Verlinkung:</p> <p>→</p> <p>→</p> <p>→</p> <p>→</p>	

Fig. 5: example for a script page

[Drucken](#) | [Hilfe](#)

**Wertstromanalyse**

**Wertstromanalyse**  
 Die Wertstromanalyse (WSA) ist eine Methode zur transparenten Darstellung von Material- und Informationsflüssen sowie dazugehöriger Prozessinformationen. Auf den folgenden Seiten werden Sie mit den Grundlagen der Wertstromanalyse vertraut gemacht. Sie werden dazu befähigt, Prozesse, Material- und Informationsflüsse in Form eines Wertstroms darzustellen. Verschwendung und Schwachstellen im Prozess können auf diese Weise identifiziert werden, um im darauf folgenden Wertstromdesign die Wertschöpfung zu erhöhen und Verschwendung zu beseitigen.

**Lernziele**  
 Am Ende dieses Trainings werden Sie


- Kunden-/Lieferantenbeziehungen
- Prozessschritte
- Bestände
- Materialflüsse und die zugehörigen Informationsflüsse
- Produktionsdurchlaufzeiten

erkennen/berechnen und als Wertstromdarstellung skizzieren sowie die erforderlichen Daten aufnehmen können.

**Voraussetzungen**  
 Grundverständnis der in der WSA verwendeten Symbole

WSA

Lerneinheit 1/10:  
Wertstromanalyse  
Hauptseite: Wertstromanalyse



LE 1 | **2** | LE 2 | 3 | 4 | 5 | 6 | LE 3 | 7

Fig. 6: example for the corresponding page in the web based training

In fact, the evaluation phase already starts during the implementation: in e-learning courses participants are interviewed, observed, or fill out questionnaires. In profound media production projects potential users are asked to test e-learning modules in advance. They measure learning times and give feedback on navigation, design, and ergonomics. The results of the evaluation goes back into the conception phase and implementation, mostly not all the way back to the analysis, although this is possible.

Along with the outcomes from each phase, miles stones defined in a time table that helps to plan the production process and supports a proper project management. The main objective of AKUE is to support cost efficient e-learning projects and guarantee high quality levels. The cost efficiency results from the strategy to ask for approval from the client at each single stage and check the quality of each outcome before the next step is entered. This is due to the fact that cost and time increase after the conception phase. So any changes done after the conception phase lead to a high increase in costs.

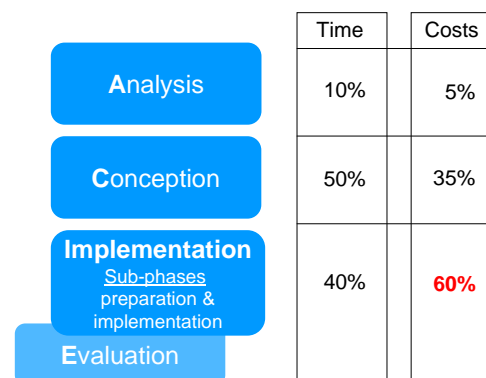


Fig. 7: distribution of costs and time in percentage per phase

### 3 THE AKUE PROCEDURE APPLIED: ROLES AND FUNCTIONS

Finally we want to look at the application of AKUE in projects and the different roles involved. Often the analysis phase is conducted together between studiumdigitale and clients, since the studiumdigitale team provides the expertise for e-learning settings, analysis of objectives and demands, potential outcomes and measurements. On the other hand, only the client knows his objectives, demands and current situation, so they need to be involved. In this phase workshops are held with the client, mainly with teams of trainers, authors, and decision makers. Most of the time homework is given between two meetings in order to assess potentials, given infrastructure or reflect on questions, objectives and potential measurements.

In the next step, a different team comes in. While in phase 1 experts on organisational development, e-learning or technical experts are needed, in phase 2 designers and authors are additionally needed. Phase 3 rather requires team members with technical skills: programmers, designers, authors, system administrators, and so on. Phase 4 is organized by an evaluation expert who already consulted the team in phase 1 and 2 on how to integrate quality assurance. This person has designed questionnaires, interviews guidelines or criteria for testing in advanced and organised the tests of the online material in phase 3.

In the last years, studiumdigitale observed a shift to allocate tasks towards the client. This is a process which is more than welcomed at studiumdigitale, since this characterizes one of the main principles of the centre: enable the customer! If the customer is closely engaged in the conception process in phase 2, the client's team members acquire more and more competencies and at one point they can prepare the raw concept, detailed concept and script on their own and leave the media production process to studiumdigitale [7]. If we consider this under the aspect cost effectiveness, this is more efficient than the involvement of too many people in the conception process: On the other hand, due to exact this consideration technical expertise and support might be located at a central level. Therefore AKUE supports cost effective media production and provision of infrastructure by a) ensuring quality assurance at each single level and b) enabling clients through standardized processes and support structures to contribute parts of the production process themselves and leave more ambitious tasks up to studiumdigitale.

## REFERENCES

- [1] vom Brocke et. al. (2007). Gestaltung und Bewertung von E-Learning Geschäftsmodellen – Ein Vorgehensmodell am Fallbeispiel e-teaching.org. In: Zeitschrift für eLearning – Lernkultur und Bildungstechnologie. 2. Jahrgang 2007, Heft 3: E-Learning Geschäftsmodelle, p. 7-18.
- [2] Bremer, Claudia; Krömker, Detlef; Voss, Sarah (2009): Wirtschaftlichkeits- und Wirksamkeitsanalysen sowie Vorgehensmodelle zur Einführung und Umsetzung von E-Learning an Hochschulen. In: Roland Holten, Dieter Nittel (Ed.): eLearning in der Hochschule und Weiterbildung. Einsatzchancen und Erfahrungen. Bielefeld: Bertelsmann. P. 61 – 80
- [3] Suessmair, Augustin; Rowold, Jens (Ed.) (2007). Kosten-Nutzen-Analyse und Human Resources. Weinheim: Beltz.
- [4] Seibt, D. (2001). Kosten und Nutzen des E-Learning bestimmen. In: Hohenstein; A.; Wilbers K. (Ed.): Handbuch E-Learning. Deutscher Wirtschaftsdienst. Cologne. Kapitel 3.3.
- [5] Hoppe, U.; Klostermeier, F.; Boll, S.; Mertens, R., Kleinfeld; N. (2007). Wirtschaftlichkeit von Geschäftsmodellen für universitäre Lehrkooperationen - eine Fallstudie. In: Zeitschrift für eLearning – Lernkultur und Bildungstechnologie, 2. Jahrgang 2007, Heft 3: E-Learning Geschäftsmodelle.
- [6] Bremer, Claudia (2009). Der AKUE-Prozess von megadigitale. In: Andreas Schwill, Nicolas Apostolopoulos (Ed.): Lernen im Digitalen Zeitalter. Dokumentation der Pre-Conference zur DeLFI 2009. Berlin. P. 233 - 240.
- [7] Bremer, Claudia (2010). Kooperative Medienproduktion und Entwicklung von Bildungsangeboten mit Unternehmen und Weiterbildungseinrichtungen. In: Apostolopoulos, Nicolas; Mussmann, Ulrike; Rebensburg, Klaus; Schwill, Andreas ; Wulschke, Franziska (Ed.): Grundfragen Multimedialen Lehrens und Lernens. E-Kooperation und E-Praxis. Tagungsband GML2