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Activity-based blended learning

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Abstract: As part of the trend towards blended learning, the Open University of Shell International Exploration and Production is shifting from predefined content-based learning to activity-based learning grounded in learners' actual workplace problems. This article acts as a case study by describing key design principles adopted by the organization and also describes how the shift addressed courses that served multinational participants. Data are provided on the learning activities in thirty-seven courses redesigned in 2002 (covering nearly 300 separate learning activities). The article concludes with some comments on work that still needs to be done as well as key implications for practitioners in other organizations.

Keywords: blended learning, work-based learning activities, corporate learning.

Introduction

E-learning and the role of technology in workplace learning have been high-profile topics in academic and practitioner HRD publications for some years. In practice, e-learning has frequently been implemented by retaining a focus on the delivery of existing content, albeit in flexible multimedia packaging. This article examines how one organization, the Open University of Shell International Exploration and Production (Shell EP), sought to enhance the effectiveness of e-learning by blending technology with social interaction and collaborative learning, workplace-based activities with supervisor involvement and input from experienced facilitators. This shift related to a recently adopted blended learning model (Bianco *et al.* 2002; Collis 2002; Margaryan *et al.* 2003) emphasizing learning activities based on workplace problems of the participants, who are petroleum engineers, petrophysicists, geologists and other technical professionals from various operating units and partners of Shell EP from across the world.

A key to the learning approach is the sharing of experiences related to these learning activities. This occurs via the use of a Web-based environment using the TeleTOP[©] system developed at the University of Twente (Collis and Moonen 2001). Courses are redesigned to emphasize not only workplace-based activities but also the submission to the common Web environment of different types of reports and reflections based on those activities. Once a collection of submissions is available,

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follow-up activities build upon it. Examples of such follow-up activities include: comparing one's own situation with that of others, and looking for key trends in the work-based submission that relate to or extend the associated study materials. In these ways, activity-based learning based on the participants' own workplace situations facilitates knowledge sharing (Collis and Winnips 2001). In addition, the likelihood of transfer of learning to the workplace is enhanced, in that this transfer is part of the learning process itself. The design of such learning activities has become a major focus of the course redesign process, superseding attention to content presentation. Content objects are seen as resources for the activities, not as the initial drivers of the activities. Selected learner submissions are re-used as valuable content objects for others.

Given this context, the article describes:

- 1 the key instructional principles for the Shell Open University approach to process-oriented rather than content-oriented learning
- 2 what happens in practice when the approach is integrated into course redesign, particularly the sorts of activities chosen by the course-director teams (subject-matter experts, course designers and instructors)
- 3 what still needs attention during the course redesign process in order to increase the likelihood that the learning activities lead to an impact on business performance.

Blended learning via the Shell Open University

The Shell EP Learning, Leadership and Development unit, the home of the Shell Open University (SOU) in Noordwijkerhout in The Netherlands, has an established portfolio of more than 200 classroom courses with registration managed through the Shell Open University's intranet portal. These courses focus on the first five years of professional and personal development of newly hired Shell petroleum engineers, petrophysicists, geologists and other technical specialists but in addition contain courses for more experienced staff.

In 2000, a decision was made to deliver some courses as stand-alone, self-study e-modules available via the company intranet. To do this, the courses were de-constructed, re-validated against identified current and future gaps in the company's competence needs and re-constructed into e-learning nuggets and e-modules that could be flexibly combined and reused to deliver up-to-date and appropriate learning programmes rapidly.

However, it was soon realized that this new e-learning strategy was not a fundamentally different way to enhance corporate learning since it still focused on delivery of pre-determined content, albeit in flexible multimedia packaging. The Shell Open University contracted with the University of Twente to assess the impact of its classroom and e-module approaches. A finding of this analysis was that, beyond e-learning, learning also needs to involve social interaction and collaborative learning, workplace-based activities with supervisor involvement and input from experienced facilitators, while retaining and even extending the flexibility of time and place that e-learning can offer. A commitment was made to a Shell-style of blended learning, with

blends not only of time and place of participation but also of different forms of activities and types of communication. Blended learning at Shell EP thus came to be defined as:

Options for different types of learning activities (with a focus on workplace problems), different types of learning resources (with a focus on re-use of experience from within the company), different times and places for learning activities (with a focus on activities being carried out in the workplace but flexibility otherwise), and different ways that people work and network together (with a focus on collaboration). These options are guided by a capable facilitator (with a focus on coaching), involve regular assessment (with a focus on workplace relevance), and are all integrated via a Web-based learning-support environment (such as TeleTOP).

(Collis 2002)

Key aspects in this approach include learning activities with direct workplace relevance; a stress on obtaining line manager support (through a tool called the learning agreement, in which participant and manager agree on a change in performance to be seen as a result of the course (Bianco and Collis 2003)); collaboration, sharing and reusing others' submissions; and multi-step problem solving. Sharing of experiences between participants in a way that is captured for further learning situations is an important goal. Figure 1 illustrates this idea. Stand-alone, self-study e-learning modules still have a place in a Shell blended course but only as part of the course, as support for workplace-oriented activities.

During 2001 this change process started with several course directors (instructors) transforming their courses from solely classroom-based into mixed-media courses of different blended styles, supported by the TeleTOP system. This process supports the scaling up of blended-learning course production within Shell EP. While the initial

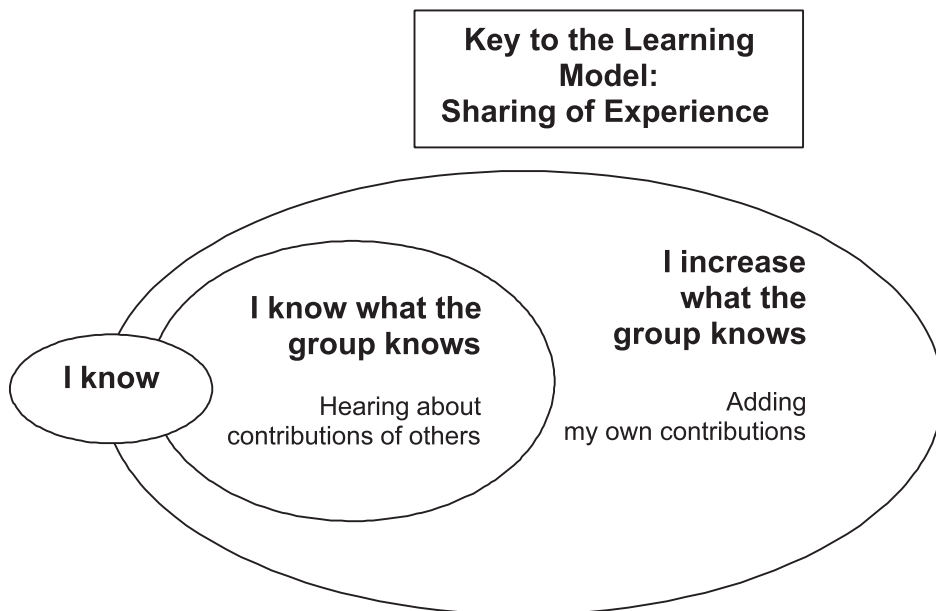


Figure 1 Sharing experiences as a basis for the learning model

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pioneers could be offered personal support, often on a one-to-one basis, as more and more courses needed to be transformed and more course directors became involved with differing levels of enthusiasm, skills and experience, then the support processes had to become more structured and formal. Thus, a ‘development path’ based on instructional design principles was developed and used in the redesign of approximately fifty courses in 2002 (Bianco *et al.* 2002) and another 50 in 2003.

Key principles of instructional design

According to Merrill (2003), there are five ‘first principles of instruction’ that define good learning settings. These principles are that learning is promoted when:

- 1 Learners are engaged in solving real-world problems.
- 2 Existing knowledge is activated as a foundation for new knowledge.
- 3 New knowledge is demonstrated to the learner.
- 4 New knowledge is applied by the learner.
- 5 New knowledge is integrated into the learner’s world.

These principles form the theoretical framework for the redesign of the blended-learning courses for the SOU. One of the key enablers of these learning approaches is Web-based technology.

The use of [technology] can shift the balance in interactions between [instructor] and [learners] more towards the [learners]. Many of the social constraints that are present in a classroom may not be present in a computer-supported learning environment, thereby providing more equal opportunities for [learners] to initiate interactions.

(Jaervelae cited in Winnips 2001: 34)

This is particularly true in learning environments where learners are non-native speakers of the main language of instruction and might often find it difficult to interact with others in a face-to-face environment. In addition, technology provides a medium for participants to carry out the sorts of work-based learning suggested by Merrill’s first principles while predominately staying in their workplaces.

In the following sections we shall show how these principles are being incorporated into the design and implementation of activity-based blended learning courses at the Shell Open University, supported by Web-based tools.

From theory to practice

To explore how the instructional design principles and technology were being applied in Shell EP, data were gathered from the action and reflection/recycling phases of thirty-seven blended-learning courses during September–December 2002 (full results of the analyses are given in Margaryan *et al.* (2002) and Hendriks (2003)). As part of this process, 299 specific activities in the thirty-seven courses were identified and analysed. The activities were grouped and regrouped until agreement

as to the final major types of activity occurred. The analysis was carried out to learn about the nature of the activities developed by the course directors and the extent to which those activities integrated the blended-learning approach and design principles.

Twenty-one activity types were derived from the grouping exercise. These are shown in Table 1, with the number of times that each type appeared among the 299 cases. Not all of the activities are directly related to solving workplace problems (for example, types 5, 8, 9) although even these can be seen as preparatory to workplace activities. However, the majority do represent efforts to target learning activities around problems in the workplace and social interaction relating to those problems.

In order to identify the extent to which the activities conceived and carried out in the SOU blended-learning courses actually related to the conceptual framework underlying the intentions of the SOU approach, the twenty-one types of activity were mapped onto the key instructional principles as shown in Figure 2. The findings highlight a balanced mapping with regards to the key principles of adult learning.

Further analysis focused on obtaining an overview of the extent to which the key aspects of the blended learning approach at Shell EP – workplace relevance, line manager support (through the learning agreement), collaboration, sharing and

Table 1 Classification and amount of use of activities in blended learning courses (n = 299)

No	Activity types	Times used
1	Kick-off (such as self-introduction, learning agreement with line manager)	36
2	Collecting information, analysing, applying and presenting the results (sources may include SME in own OU, own workplace, www, Shell communities of practice)	65
3	Developing a product (such as a plan, inventory, standards, etc.)	20
4	Synchronous discussion (in an online chat room)	10
5	Mid-course feedback (a questionnaire)	4
6	Sharing experiences on a given topic, submitting contributions to the course site	10
7	Comparing and contrasting (such as submissions, workplace problems, etc.)	13
8	Exercises (such as calculations, drawings, charts, etc.)	16
9	Quiz	14
10	Case study	4
11	Self-analysis (via questionnaires, questions from the instructor, a model, etc.) and application	11
12	Problem solving (real problems from the learners' workplaces)	27
13	Asynchronous discussion (via an online discussion forum)	10
14	Studying content resources (such as instructor notes, viewgraphs, e-learning nuggets, materials on www)	33
15	Interim meeting with line manager to discuss learning progress	3
16	Preparation for a certification exam (such as Curtin)	1
17	Preparation for a F2F workshop (if the blend involves online and F2F)	3
18	Poll	1
19	Role play	2
20	Wrap-up (such as reflection on experience with the course or a self-check to make sure all assignments are completed)	2
21	Reflection (on a topic proposed by the instructor)	14
<i>Total</i>		<i>299</i>

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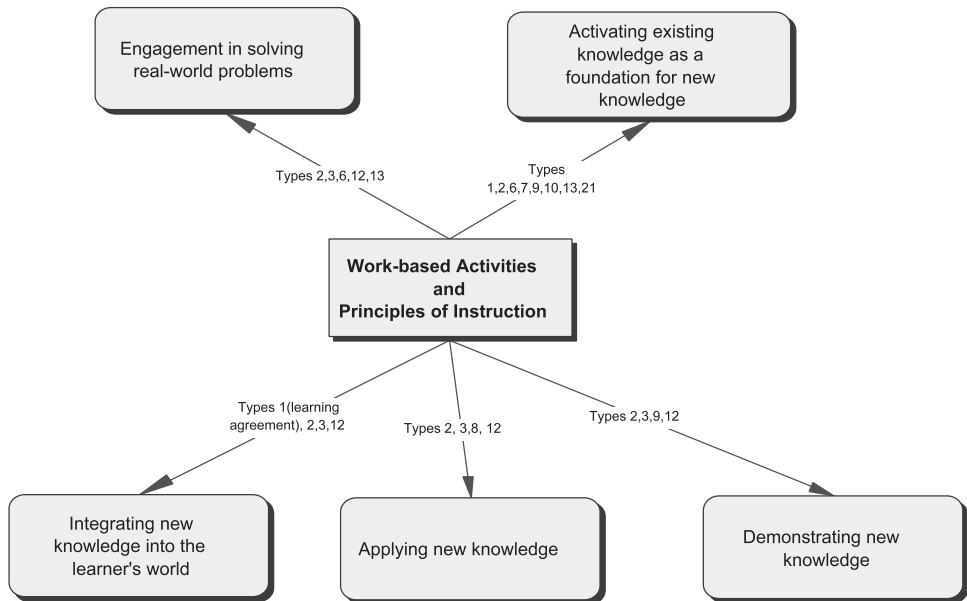


Figure 2 Mapping of work-based activities with the principles of instruction

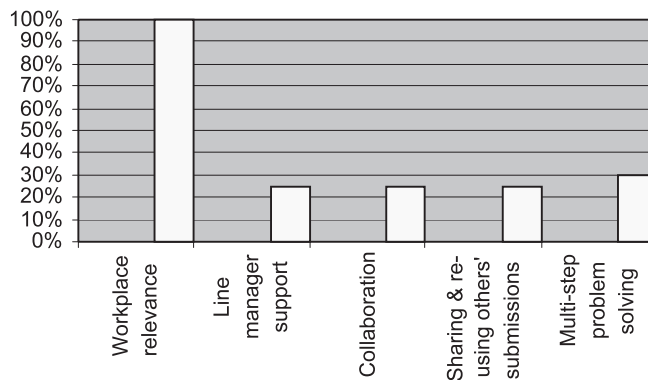


Figure 3 Implementation of key aspects of the blended-learning approach

reusing others' submissions and multi-step problem solving – were implemented. This is shown in Figure 3.

Thus workplace relevance has been strongly taken up in the courses. The other aspects are developing, and are present in some courses but not others. The first step of the process of sharing experiences that is shown in Figure 1 is in place, in that participants are submitting many different descriptions and analyses of their workplace experiences into the course Web environments. However, most course facilitators are not yet leading the participants to take the next step of actively studying each other's submissions and building upon them for a follow-up activity. While there is a group of participants on the course, in most cases each interacts

individually with the course facilitators rather than with other participants. It should be noted that, in terms of line manager support, the percentage shown in Figure 3 is 100 per cent for the courses that ran after the line manager agreement was initiated in summer 2002.

A few examples of activities demonstrating these aspects are:

- In a course on health risk assessment, participants arrange a visit to a site of their choice in their workplaces and diagnose it in terms of potential health or safety hazards. The activities in this course progressively build upon one another, the final product being a health risk assessment plan for their workplaces, ready to put into action.
- In a course on applied production technology, the blend involves a face-to-face workshop with a pre-workshop component carried out via TeleTOP. During the pre-workshop component, learners are asked to identify a problem in their workplace within the scope of their job role to solve and to discuss this with their workplace manager. They must submit a description of the problem three weeks before the workshop to the course site so that everyone can see it, and the course instructor can provide feedback on the problem or help the participant modify the problem statement before they bring it to the workshop. At the workshop, the learners, who are all production technologists from various Shell operating units in the world, form small groups to tackle the submitted problems by peer-assisted activities.
- In the course 'Commercial Mindset', the activities all relate to the participants' analysis of commercial opportunities in their own workplaces. Once these analyses are submitted to the course environment, follow-up activities occur where the participants reflect on summaries of others' submissions and compare and contrast these with their own workplace situations.

Given these findings for 2002 (and supported by an on-going analysis of courses in 2003), it can be stated that good progress is being made towards realizing some of the main goals of blended learning at the SOU. However, Figure 3 shows that there is still much to be done. The following are target areas for continuing work:

- 1 Performance orientation – activities should be based on dealing with specific workplace problems, rather than on simply finding out what is happening in the workplace. Hence, course objectives should be expressed more in terms of 'what to do' related to the workplace problem or opportunity, rather than 'what the participant will know about'.
- 2 Collaboration and sharing – activities should make even more use of the opportunity for participants to learn from each other and work collaboratively. Efforts should be made by the course design teams to integrate corporate knowledge-sharing networks and best practice databases within the courses.
- 3 Line manager support – data from a parallel study on line manager and participant perceptions on the blended learning (Bianco and Collis 2003) showed that learners were pleased with the learning agreement activity, while the line managers felt it was just more paperwork. Hence, it is necessary to identify additional tools and strategies to involve the line managers, to extend their role

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from ‘approving’ participation in the course to being full partners in the learning process.

In addition, more data are needed to see if there is a positive correlation between types of learning activity and business impact as well as the relationship of different types of activity to the costs involved in designing and implementing activity-based blended learning. To do this, a course-scan analysis process similar to the one used to study the thirty-seven courses from 2002 has been developed and piloted as part of an extensive ‘e-evaluation’ process and is now being launched throughout the SOU.

Conclusion

Corporate changes towards blended learning are often based on a limited range of research related to learning. This is particularly so with respect to the applications of technology to learning, about which decisions often occur on the basis of contact from vendors. The Shell Open University, through its collaboration with the University of Twente, is basing its redesign of learning on extensive research. The focus on workplace-oriented activities and contributions for reuse is beginning to take root in the courses after only a year of reorientation. The analysis of activity types such as reported in this paper is important to add depth and breadth to the overall ideas related to blended learning.

The approach at the Shell Open University is both evolutionary and revolutionary. It is evolutionary in that many of the features of learning that have worked well for Shell in the past, particularly the use of experienced practitioners as course directors, are retained and extended. But it is revolutionary in the shift from content to process, and in the application of an instructional redesign method focused on widespread implementation (the development path) as well as an evaluation approach based on a causal model for learning impact. Technology is an important tool for learning, particularly in terms of facilitating flexibility and reuse of learner submissions. However, technology does not replace the central importance of interpersonal contact: among learners, between the course director and learners, between the learner and his line manager and between the learner and workplace colleagues. Technology is a tool to make this contact richer, more flexible and reusable.

Implications for practitioners in other organizations

While each organization has its own context, we believe there are key aspects of the Shell EP approach that can be applied in other corporate learning settings. We suggest:

- consider using Merrill’s first principles of instruction as a framework for your courses
- make the real-world problems addressed in your courses also real to the workplaces of the individual participants; do this by building your courses around work-based activities that are agreed upon as important by both the participant and his or her manager

- use a course Web environment as a tool for participants to submit on-going documents and discussion responses based on their work-based learning and for follow-up activities based on peer sharing of those submissions; look for opportunities for those follow-up activities to involve collaboration and peer assistance.
- make use of other knowledge-sharing tools that may be available in the company, such as discussion forums or best-practice databases, to bring in-house experiences into the course.

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