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ABSTRACT

Effective teaching is systematic and well planned and student learning depends not only on student-based factors such as ability and prior knowledge, but also on the teaching context and on good management. Often, students need to be supported in gaining mastery in skills and new concepts. This paper outlines six examples of providing World Wide Web-based learner supports. Three of them are initial supports, provided from the start of a course and faded so that students can learn to self-regulate, and include giving away parts of the solution, providing World Wide Web links, and providing video comments. Three are ongoing supports, provided during a course and based on student input, and are providing open feedback comments, using a feedback form, and linking to good examples of student work. Implementation depends on course structure and requirements, the course support environment that is used, and the desired time investment of instructors. The supports mentioned require no advanced technologies so they can be implemented in most course support environments to help learners self-reliantly perform their tasks. The examples mentioned in this paper are not intended as an extensive framework for World Wide Web-based learner support, but more as examples of good practice. (Contains 13 references.) (AEF)

Six WWW Based Learner Supports you can Build

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Abstract: Effective teaching is systematic and well planned and student learning depends not only on student-based factors such as ability and prior knowledge, but also on the teaching context and on good management. Often, students need to be supported in gaining mastery in skills and new concepts. In this article we outline two forms of support that can be offered online which we call initial and ongoing support. Initial support is provided from the start of a course, and faded so that students can learn to self-regulate. Ongoing support is provided during a course, and is based on student input. The examples mentioned in this paper are not intended as an extensive framework for WWW-based learner support, but more as examples of good practice.

Introduction

One of the challenges for instructors when designing a course for online delivery is to provide a task that is demanding enough for the learner, but not too challenging, as the learner should be able to accomplish the task. When learning in a classroom where face-to-face contact is possible, an instructor may easily spot the difficulties students have while learning, and provide extra support, so that the learners are able to accomplish the task. When learning via Web-based environments, possibilities for face-to-face contact are reduced, making it more difficult for instructors to respond to student requests, and to provide adequate support. This paper provides some examples and opportunities for WWW-based learner support as forms of effective pedagogy. In an ongoing effort to find ways for supporting students, the settings wherein these supports are provided are varied, but have some common factors. First of all the learners are assumed to be active, which means in practice that students will be working on designing a product. Hereby the product is a proof of learning, and monitoring of progress takes place by delivering and providing feedback on a number of prototypes for this product. In some cases the result of student work is used as content for the course itself (see Collis, Winnips, & Moonen, 2000). For the teaching-learning context, a course support environment is used, and it is assumed that the supports presented in this paper can be applied in any course support environment.

Learning theory underpinning learner support

The key concept underlying learner support is scaffolding. Traditionally, scaffolding has been a principle aimed at promoting self-reliance in students. The principle of scaffolding was originally described in the context of language learning (Bruner, 1978; Wood, Bruner, & Ross, 1976), where it was used as a metaphor to describe effective interactions between a teacher and a student. The term can be traced to Vygotsky's concept of "the zone of proximal that is the actual developmental level of the learner compared with the level of potential development that can occur with guidance or collaboration with a more competent person. Scaffolding should enable learners to perform activities they were unable to perform without this support (McLoughlin, 1999). Scaffolding as a form of learner support is related to cognitive-apprenticeship theory (Collins, Brown, & Newman, 1989) in that cognitive-apprenticeship theory provides one of the frameworks in which scaffolding can be conceptualised.

When we think of scaffolding we often think of the temporary structures thrown up around buildings to support workers as they build. When the building is completed, the structures are removed, as the support is no longer needed. Similarly, in a learning context, when students can cope with a task independently, the support is faded.

Scaffolded learning should eventually result in self-regulated learning, and thus more self-reliant students. Recent developments in pedagogy and educational science also picture this more active, self-reliant role for students, self-regulating their own learning processes (Boeckaerts, 1995, 1999; Pressley, 1995; Shin, 1995; Winne, 1995); and actively creating new knowledge (Perkins, 1991). For self-directed learning, metacognition is needed (Boekaerts, 1995), which is also helpful for lifelong learning (Dunlap, 1999). As students are being supported to work self-reliantly they can learn how to learn, which is critical for their professional futures where they will be required to keep themselves up-to-date in their own professions. Designers of WWW-based learning environments can benefit from this research in order to help students learn to self-regulate their learning.

In this paper we distinguish between two types of support, initial and ongoing. Initial support is provided from the start of a course, and faded so that student can learn to self-regulate. Ongoing support is provided during a course, and is based on student input. Examples are given of initial and ongoing supports, with advantages and disadvantages, supported by attitude data from students. These examples are not meant as an extensive framework for WWW based learner support, but as examples of good practice.

Initial supports

Many forms of initial supports can be discerned. For example, learners can be given access to a database of student projects of the year before, hints can be given about common problems and planning can be provided to structure course activities. During a course, as fading is going on, students should have less need for initial supports as they learn to self-regulate. The following examples of initial support are described: giving away parts of the solution, providing WWW links, and providing video comments.

Giving away parts of the solution

When the learner has to complete a specific task, that requires a variety of cognitive skills, some form of initial support can be used to free learners from potentially boring, repetitive tasks. This enables students to engage with the more complex and cognitively demanding aspects of the task. By giving away a part of the solution the learner can devote more time to the more challenging cognitive elements of the task. Acovelli & Gamble (1997) used this form of support when learners had repeatedly demonstrated mastery of a modeling task. If a learner has proven to be able to complete a task, a computer coach will complete all of the tasks smaller components for the learner.

A similar approach was chosen in a course about learning to design educational media-products in the faculty of educational science and technology. The task was to build a WWW site with some explanation about a specific design guideline for the design of media-products. The layout for the explanation page was provided for the students, as they had already demonstrated their ability to design and build a WWW site, and the content of their explanation was more important than the layout of the page. A screendump of the template for doing this assignment can be found in Figure 1.

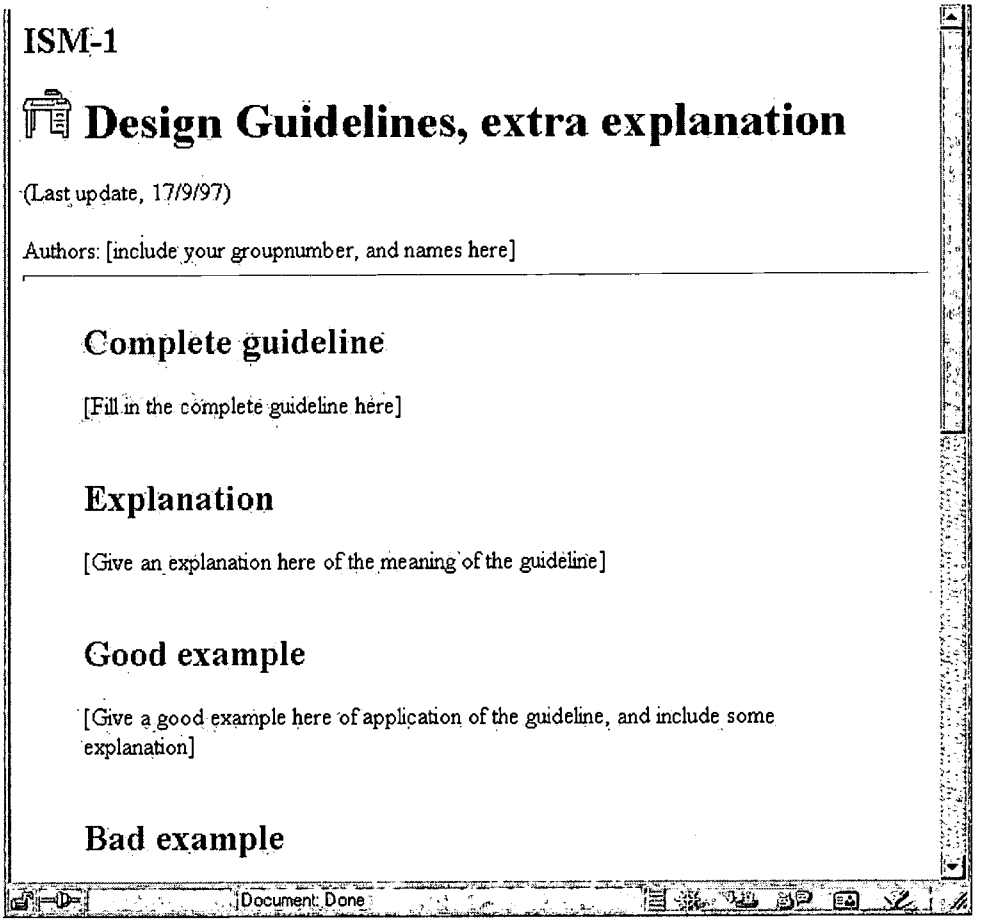


Figure 1. A WWW template for providing extra explanation about a design guideline.

By providing this WWW template, students did not spend time on doing layout for their pages, and could free more time to focus on the content, which was more cognitively demanding.

Providing WWW links

Another way to provide initial support is by providing WWW links. In a course about the theory of media use in education, called ISM-2, students were asked to design a WWW page with information about the theory of designing media-products. In the course environment of ISM-2 links were provided as starting points for the search for information about the topics students chose. When asked in the beginning of the course student scored neutral on the question whether they would like to receive more support via built in explanations on the WWW (such as text descriptions, video, examples, hyperlinks) (mean 2.97, sd 0.83, on a five point scale ranging from negative to a positive attitude), indicating at least no dislike of being supported in this way.

Video comments

In the same ISM-2 course of the last example video comments were included to give the first introduction to the topics of the course. These were 2 to 3 minutes long video clips in Realvideo format that were synchronized with the accompanying PowerPoint slides with software called 'Sync-O-Matic 2000' (available from http://www.syncomat.com/). Figure 2 shows a screendump of one of these video comments.

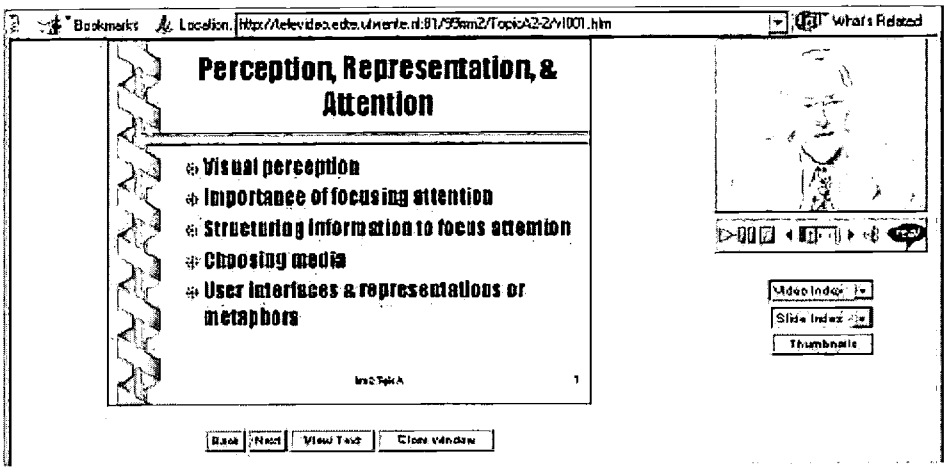


Figure 2. Video comments synchronized with PowerPoint slides as initial course support.

The text of the clips was also made available by clicking the 'View text' button. Students could browse through these comments in order to choose a topic they would like to explore further and provide more information on. Providing extra information on one of the course topics was the product students were asked to design for the course. Some, not all, students were very positive about having these video comments to study. Not so positive students experienced problems with the length of the video clips (too long), and bandwidth problems (the clips were designed for 56K modems).

Ongoing supports

There are many ways to include ongoing supports in a course. Ongoing support should be based on monitoring the progress of students. So, ongoing support is personalised support, and therefore will generally cost more time-investment from the instructor or peer-students providing this support. Further, in ongoing support scaffolding can easier take place, as support can be faded when it is no longer needed. Ways of providing ongoing support can be building a list of frequently asked questions during a course or providing hints based on student work. Three other examples are explained below.

Providing open feedback comments

The ISM-2 course was planned for students to submit several subproducts of the WWW site before submitting the final version. By way of these subproducts learner progress could be monitored and feedback could be given. First learners had to submit what articles they had chosen as an addition to the course, with a statement of the reason why they had chosen this particular article. After that learners produced a summary of the article to contribute to the course materials. When the learners improved their summaries with the help of instructor feedback they were added to the course materials. The instructor feedback typically consisted of one page, with comments about the chosen articles, personal notes about the authors, and the adequacy of fitting this article into the course.

Students were positive about receiving these kinds of extensive instructor feedback. Table 1 indicates that students were more satisfied in this course with receiving feedback from instructors than with receiving feedback from peers.

Student level of satisfaction	Mean (n = 29)	SD (n = 29)
The support from staff members is sufficient (in group sessions, by personal e-mails, conversations, etc.)	3.41	1.10
I think the support given from staff members (by personal e-mails, conversations etc) fits my actual level of knowledge.	3.62	0.88
I would like to receive more support via peer-feedback	2.71	1.05

Table 1. Student levels of satisfaction with teacher feedback compared with peer feedback[a]

[a] All scores are based on responses to a five-point scale, with 1= to strongly disagree and 5= strongly agree.

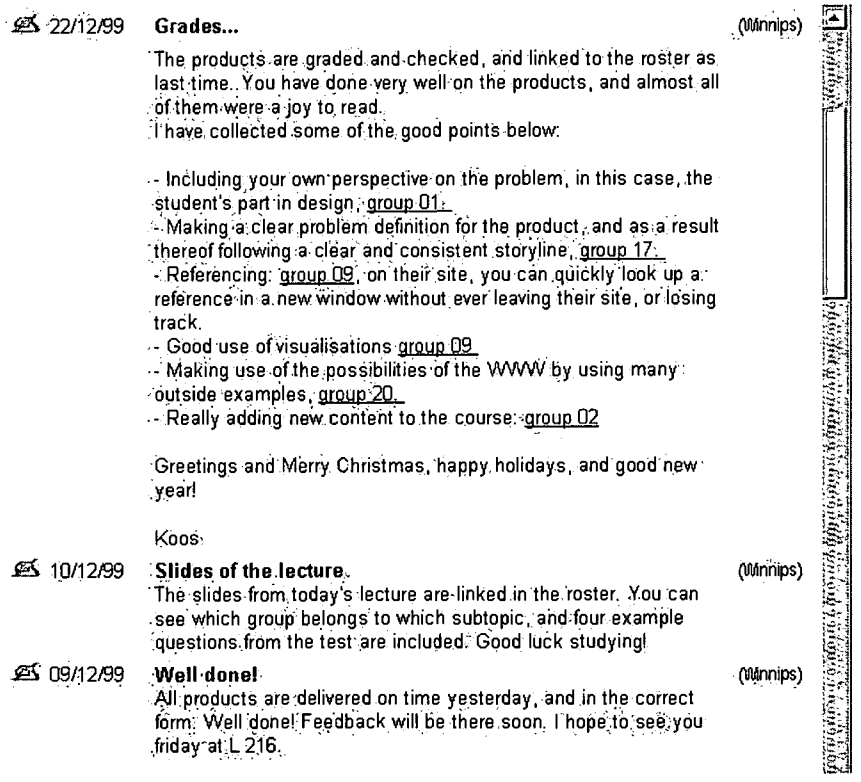
A problem with providing extensive feedback comments was instructor time-investment (see Collis, Winnips, & Moonen, 2000). In order to write the feedback, the course instructors needed to read all the proposed articles in order to form their own opinion about them, and needed to take care in recording the comments, as they were included in the course support environment. However, when we compared a group of students who received this feedback with a group that did not receive this feedback but did a similar assignment, no significant differences were found on achievement scores for the final examination of the course.

Using a peer-feedback form

Peer-feedback can be used as a way to deal with time-investment problems of instructors when they are providing open feedback comments. In a peer-feedback form groups of learners can comment on each other's work, using the criteria as stated in the course requirements as a framework for providing comments. Apart from reducing some of the workload of instructors, and providing support for students, giving peer-feedback could help students to focus on the course criteria in relation to their own work. By using the criteria for others, learners become more active and may be challenged to reflect on the criteria in relation to their own work. Form fields can be used on a WWW page to structure the feedback. When the form is posted to the course support environment learners can directly see what feedback was received and they can respond to it. Not all course support environments nowadays have the possibilities to include self-made forms. This problem was solved in one of our own courses by programming in Active Server Pages (ASP) which made it possible to include the filled-in form directly on a WWW page. Though awkward in terms of usability, this problem could also be solved by including the questions in a text file, asking the learners to add to this file, and repost it into the course environment.

Linking to good examples of student work

A further way of providing ongoing support in ISM-2 was to link to good examples of student work. The assignment of adding to the ISM-2 course materials was repeated two times in the course. After points were given for the first assignment good examples of student work were linked to the 'Newsflash' section of the course support environment. The comments in the Newsflash message related back to the criteria for the products that were provided beforehand. In Figure 3 the message with the links to good examples in Newsflash can be found.



22/12/99 **Grades...** (Winnips)

The products are graded and checked, and linked to the roster as last time. You have done very well on the products, and almost all of them were a joy to read.
I have collected some of the good points below:

- Including your own perspective on the problem, in this case, the student's part in design, group 01.
- Making a clear problem definition for the product, and as a result thereof following a clear and consistent storyline, group 17.
- Referencing: group 09, on their site, you can quickly look up a reference in a new window without ever leaving their site, or losing track.
- Good use of visualisations group 09
- Making use of the possibilities of the WWW by using many outside examples, group 20.
- Really adding new content to the course: group 02

Greetings and Merry Christmas, happy holidays, and good new year!

Koos

10/12/99 **Slides of the lecture.** (Winnips)

The slides from today's lecture are linked in the roster. You can see which group belongs to which subtopic, and four example questions from the test are included. Good luck studying!

09/12/99 **Well done!** (Winnips)

All products are delivered on time yesterday, and in the correct form. Well done! Feedback will be there soon. I hope to see you friday at L 216.

Figure 3. Message in 'Newsflash' with links to good examples of student work.

This way of providing learner support can help to give learners more clarity of what was aimed for with the criteria for products as stated by the instructor. A disadvantage of this way of learner support however is that it is a 'public display' of work, and resulting from that only positive examples should be included.

Conclusion

In this paper six examples of providing WWW based learner supports are provided. Three of them are initial supports, 3 of them are ongoing supports. Implementation of these depends on course structure and requirements, the course support-environment that is used, and the desired time investment of instructors. The supports mentioned require no advanced technologies so they can be implemented in most course support environments to help learners self-reliantly perform their tasks.

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