The Future of Education – Lessons learned from CERC Workshop "Future of Education" and an Online Course on "Digital Basics"

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Abstract
Based on the findings in the development of an interactive self-learning course as an additional offer in vocational education, the participants discussed future educational concepts at a workshop during CERC 2021.

Keywords
Education, Vocational Training

1. Introduction

In the project »Education 4.0 for SMEs« we asked teachers and students from vocational schools which digital competences they want to foster which are not or only superficially included in the normal curriculum. Based on this survey we developed an interactive online course »Digital Basics« with the following topics:

1. Office Basics,
2. Data protection on the internet,
3. Motivation — especially for education,
4. Tinkercad — creative ideas for future education,
5. Job application coaching.

Didactically, »classic eLearning« is implemented here, but the materials provided are just as suitable for use in normal school operations as they are for the »inverted classroom method«. Each topic is offered in a module independent of the other topics.

In the workshop, we gave a brief insight into this course, and then discussed how education could basically be designed in the future.

This article aims to present the insights gained in the workshop based on the principles developed for the online course. These insights were incorporated both in the revised version of the course before its actual implementation with learners and in various other events based on the course content (see chapter 5). The conclusions (see chapter 7) are based on the findings of the course implementation as well as the further events.

The course is offered in German via the moodle eLearning platform. An insight into the course content can be obtained via https://rloew.eu/digitalbasics.

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2. Basic Preliminary Considerations

The aim of the course is not to impart complete technical knowledge, but rather to provide an introduction to the individual topics. The curiosity of the participants is to be awakened so that after working through the course they can continue to explore the topics of interest to them independently.

To this end, the course attempts to create an awareness of problems in order to recognize pitfalls in professional practice and to be able to react correctly.

These principles are now presented on the basis of the topic modules, which differ considerably from one another in their implementation. From this difference we would like to gain experience on how these methods are accepted by the learners in order to shape education of the future.

3. Modules Implementations

3.1. Office Basics

Using numerous materials and learning videos on word processing, presentation and spreadsheet, an introduction to Office is given, which is supplemented by exercises. The course is essentially limited to technical knowledge for implementing commonly needed functions. For example, design basics are deliberately excluded, although how text formatting works is shown.

Learning content already available on the web for self-study was deliberately used in a slightly modified form to give learners the opportunity to deepen their knowledge with content from the original course after completing the course.

3.2. Data Protection

After a brief introduction to the basics of data protection, the course looks at opportunities and risks in social media. The aim is to raise awareness that it is problematic to simply post what interests you. For example, you should consider whether a photo might violate a person's personal rights or contradict the confidentiality of company information. You should also recognize whether it is better not to comment on a post or answer a question in social media under any circumstances, since the intention behind this is to spy on a person in a personal or professional environment.

Digressions on creating »good passwords«, for example, show other areas of data protection that can be directly implemented in practical everyday life.

This topic usually involves working with examples in which the participants think of the answers on their own, after which the solution is displayed together with an explanation (see fig. 1 and fig. 2).

3.3. Motivation

How can I motivate myself? Based on an existing podcast series on the subject, participants are introduced to the topic. Here, too, the entire podcast series is then available for further self-study. Interactive quizzes are used to playfully check learning progress.

3.4. Tinkercad

The task is to design your own vision of the »education of the future« as a CAD model. For this purpose the CAD software Tinkercad is used, which is offered free of charge web-based by its producer. This way we want to show that nowadays you should be able to learn and use new tools quickly. If

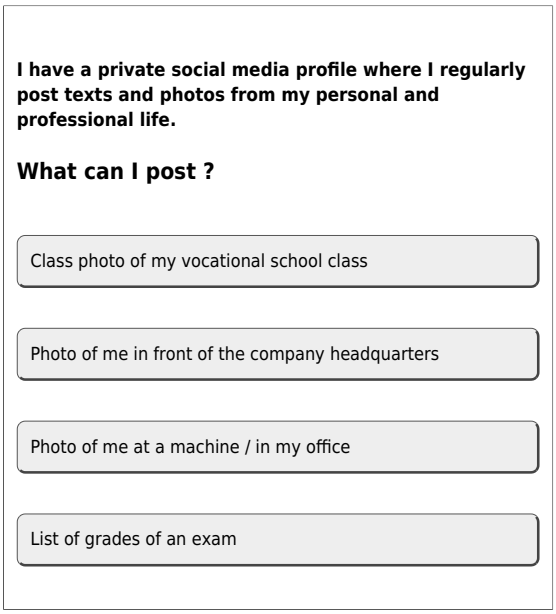

Figure 1: Example of an interactive question of module data protection.

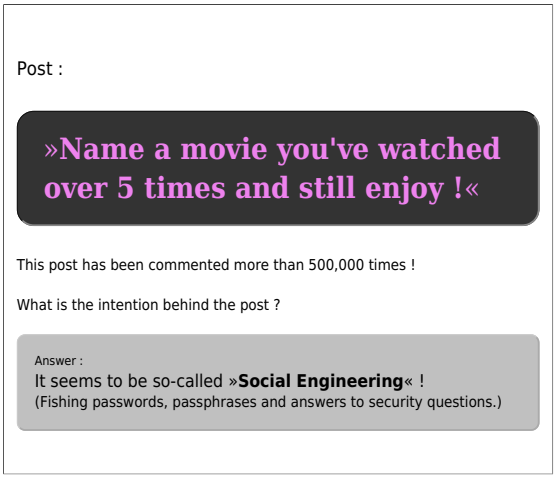

Figure 2: Example of a post shown in module data protection.

you have ever played with Lego™ building blocks, you should be able to implement your own creative ideas quite quickly with Tinkercad (see fig. 3).

3.5. Job Application Coaching

This section provides tips on how to create your own application documents. The result of this part of the course are documents that can be used directly in an application. Part of the offer is to submit the created documents and receive comments from experts.

Knowledge is provided on how to behave in job interviews by means of a number of quizzes, in which a question is first answered by the participant and then the correct answer is displayed (see fig. 4).

Figure 3: Example of a model on »future workplace«.

Figure 4: Example of an interactive question of module job application coaching.

4. Workshop

In the context of an impulse lecture of the workshop, the modules of the course and the different learning methods used were shown as examples in order to form a basis for discussion.

Likewise, other »modern« learning methods were briefly discussed, such as Inverted Classroom [1].

An important result of the workshop discussion was that the evaluation of learner behavior can provide detailed conclusions about the acceptance and motivation of the learners. Therefore, this should already be planned during the design of the course, as one goal of the course was to gain insights into how learning in vocational education will be optimally designed in the future.

Here we would like to thank the workshop participants for their active contribution and many creative suggestions, which we were able to incorporate before the start of the course. For example, the logging of participant behavior in the »Data Protection« module was optimized so that a summary can be viewed online at any time (see fig. 6).

5. Using the Course Content in other Project Offerings

Based on the course content, interactive lectures were offered as part of several events — here is a selection:

5.1. AzubiCamp 2022 : Digital Learning Camp for Apprentices

Interactive presentations were offered to the participating trainees on the following topics

- Trainees recruit trainees — apply for a job and your company (based on the module »Job Application Coaching«),
- Pimp my data protection (based on the module »Data Protection«),
- Where did it go? — Finding and retaining your own motivation (based on the module »Motivation«).

5.2. alles digital — Skills and Tips for Trainers

- Digital basics for trainees — an e-learning course (presentation of course content)

6. Analysis of the eLearning Course

To find out which types of learning were popular for participants and how, we used the following methods of analysis:

- Survey of learners immediately after their completion of the course,
- Discussion during the final event,
- Log evaluation (learning analytics),
- Feedback during the events mentioned in section 5.

6.1. Survey Result

The various modules were all rated as at least good, both in terms of content and the learning method selected in each case. In the Office module, it was suggested that there should optionally be more in-depth courses or courses that go beyond the basics. The usability in the professional environment was also rated as good for all modules. The data protection module, which was intended to raise interest in the topic rather than to convey technical content, was very well received by the participants thanks to its playful and very example-oriented approach.

6.2. Final Discussion

It became apparent that the participants liked the various methods. The interactive learning content was particularly well received.

Fig. 5 shows that the participants enjoyed it and learned something new. They also saw the applicability of what they had learned in practice as good.

In a quiz at the final event, it showed that at least the most important basics stuck with many participants and that they had a very good understanding of the principles.

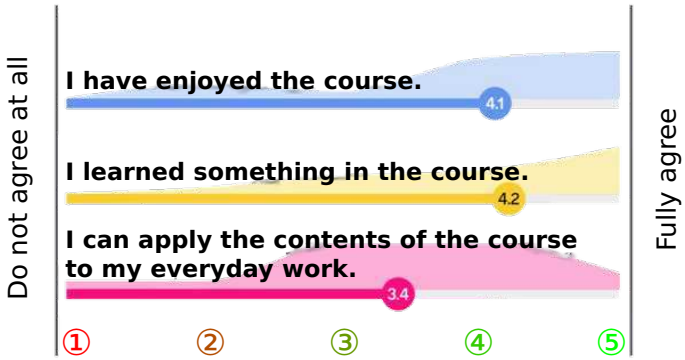

Figure 5: Survey during the closing event of the eLearning course.

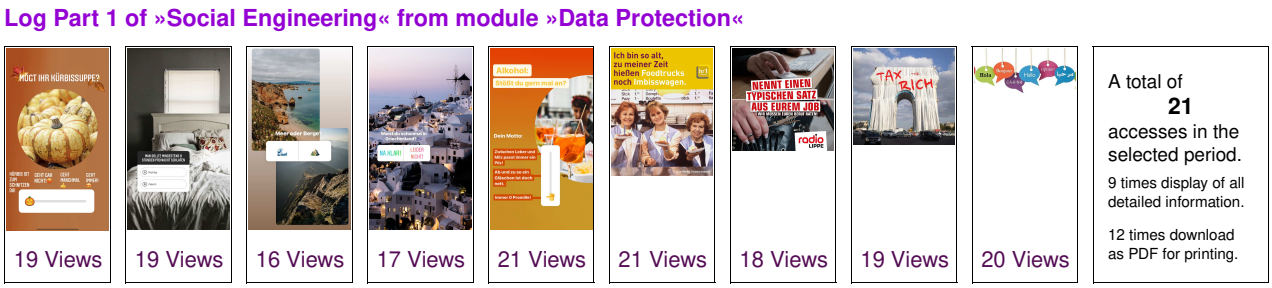

Figure 6: Evaluation example Learning Analytics.

6.3. Learning Analytics

The evaluation of the logs of the first run of the course is not yet completely finished, since the analysis is to be done together with the second run; however, the following statements can be made:

1. If a topic was processed by a participant, most of the learning content from it was usually also reviewed.
2. The order of working on the topic mostly followed the order suggested in the course, although this was not mandatory.
3. Exception with 1. and 2. was here the topic Office: Here the focus was often on one of the topics of the course. Exception with 1. and 2. was here the topic Office: Here the focus was often put on one of the subtopics word processing, presentation or spreadsheet. However, this was to be expected, since the previous knowledge of the participants was extremely different according to the pre-survey.
4. Further offers — e.g. links to websites with more in-depth information — were rarely used.

The evaluation example in Fig. 6 shows how many participants viewed the detailed information on the posts in the »Social Engineering« section (period 2 days, 21 participants).

7. Conclusions

As we suspected, a mix of learning methods turned out to be positively valued by learners. It seems worthwhile to carefully consider how each learning content is presented, reinforced, and motivated.

In an online-only learning experience, interactivity is critical to learner motivation due to the elimination of all interaction between participants that occurs in almost all other forms of learning.

The ability to contact the provider team with questions was also rated well; although this was rarely used by participants during the course. The participants were mainly trainees who were supported by their training company during the course. Therefore, there was also a further possibility of support by the trainers.

Hint

An overview of the project results can be found in the recommendations for action [2].

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