Assessment in Smart Learning Environment – A Case Study Approach

Blanka Klimova

Abstract Current learning is becoming smarter thanks to the rapid development of mobile technologies. This, however, causes changes in traditional educational settings, such as learning takes place anywhere and at any time and in real-world context. The main emphasis is put on a learner itself and all is aimed at satisfying his learning needs in a new, smart learning environment. Therefore, the purpose of this article is to explain the current concept of smart learning environment, to explore its key criteria, and to show through a case study approach how assessment can be done in this smart learning environment. This is done at the example of an assignment carried out in the Course of Academic Writing taught at the Faculty of Informatics and Management in Hradec Kralove, Czech Republic. In conclusion the author of this article lists the skills which students need to succeed in their studies in this environment.

Keywords Smart learning environment · Assessment · Case study approach · Students' skills

1 Introduction

With the fast development of mobile technologies, current learning processes are becoming, on the one hand, more effective but, on the other hand, more complex because they require constant modifications and adjustments of teaching methods and materials so that learners' needs could be satisfied. One of the most popular buzz collocations nowadays in connection with learning is *smart learning environment*. There are ample definitions of smart learning environment (cf. [1–3], or [4]). The most recent has been provided by [5] who understands smart learning environment (SLE) as technology-supported learning environment that can make

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adaptations and provide appropriate support (e.g., guidance, feedback, hints or tools) in the right places and at the right time based on individual learners' needs, which might be determined via analyzing their learning behaviours, performance and the online and real-world contexts in which they are situated.

Furthermore, [5] also listed three essential criteria of SLE which are characterized as minimally *context-aware* (taking into account the learner's situation or the context of the real-world environment in which the learner is located); minimally *supportive* of the learner and his online and real-world contexts; minimally *adaptive* to the user interface (e.g., ways of presenting information), subject contexts to meet the personal factors (e.g., learning preferences), and learning status (e.g., learning performance). In addition, [2] provide more detailed descriptions of these three criteria:

- *Mobility*: The continuousness of computing while learners move from one position to another.
- *Location awareness*: The identification of learners' locations.
- *Interoperability*: The interoperable operation between different standards of learning resources, services, and platforms.
- *Seamlessness*: The provision of everlasting service sessions under any connection with any device.
- *Situation awareness*: The detection of learners' various situated scenarios, and the knowledge of what learners are doing with whom at what time and where.
- *Social awareness*: The awareness of learners' social relationship, including what do they know? What are they doing at a moment? What are their knowledge competence and social familiarity?
- *Adaptability*: The adjustability of learning materials and services depending on learners' accessibility, preferences, and need at a moment.
- *Pervasiveness*: The provision of intuitive and transparent way of accessing learning materials and services, predicting what learners need before their explicit expressions.

However, in such an environment learners must be self-directed, motivated to study and responsible for their own work [6]. Therefore, this article aims at demonstrating how these three criteria mentioned above can be reflected in assessing learners' skills of formal writing in the Course of Academic Writing which is taught at the Faculty of Informatics and Management (FIM) of the University of Hradec Kralove in the Czech Republic.

2 Background Information

The purpose of this article is to explore how students' assessment can be done in SLE. To attain this research objective, the author used a *case study approach* [7]; an empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly

evident; and in which multiple sources of evidence are used. The author chose a representative assessment done in the blended Course of Academic Writing as the case study sample. Within this one-semester optional course for FIM students, which usually lasts 11 weeks, students learn how to write professionally. In addition, they focus on those features which are different in English and Czech, such as citations, compiling a bibliography or using appropriate English. As for the last aspect, there are independent sections on grammar structures in written English, lexical structures, and punctuation. The main topics are as follows: a summary of a lecture or a seminar; argumentative essay; professional essay 1 (including references and bibliography); professional essay 2 (including references and bibliography); writing an article for Wikipedia; and final consolidation and evaluation of the course by both the teacher and the students. There are usually five assignments/assessments during the course (see Fig. 1 below): a one–paragraph summary of a lecture/seminar; an argumentative essay without bibliographies and references; two essays including bibliographies and references and writing an entry for Wikipedia. In order to get a credit from this course, students have to do all assignments, including uploading the last article into the online version of Wikipedia.

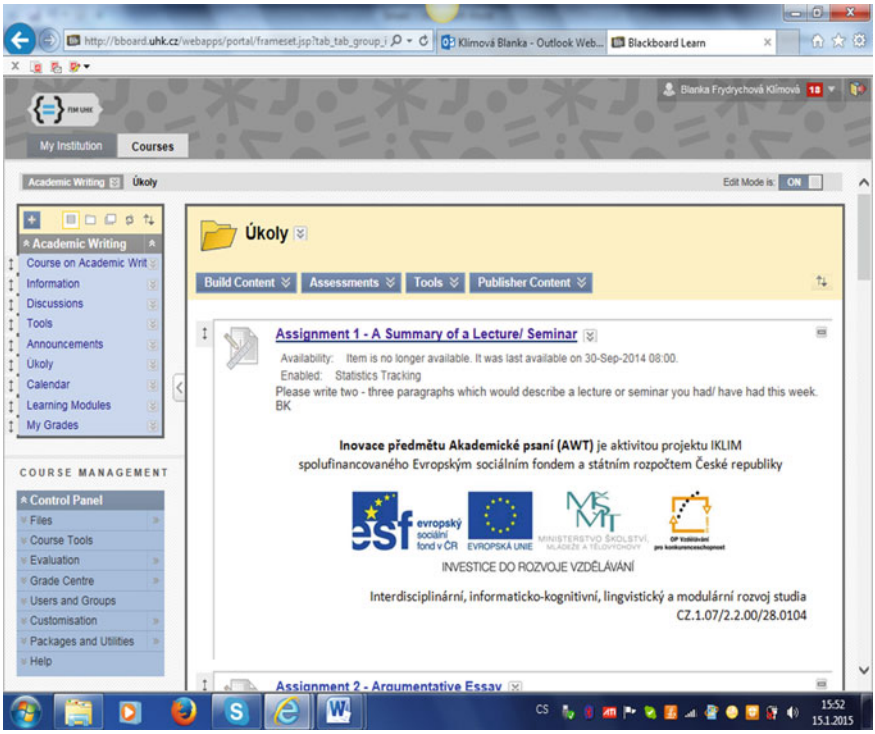

Fig. 1 An example of five continuous assessments in the course of academic writing [8]

All these assignments are formative assessments and thus they are carried out throughout the whole course every second week in order to help students to improve their writing skills. According to [9], formative assessment should be prevalent in writing courses for the following beneficial reasons:

- Formative assessment gives students a reason to read and understand the instructor's comments on their writing.
- Formative assessment aids students in applying the instructor's comments to the same or a very similar writing assignment, thus aiding them to become better writers.
- Formative assessment builds more time into the students' schedules for thinking and writing about assigned topics and results in better thinking and writing.
- Formative assessment helps students become better critics of their own writing, hence better revisers of their own writing.

For the purpose of this article the author chose just one assessment which corresponds to the SLE framework and that is the writing of an entry for Wikipedia and can be easily evaluated since it appears in the real-world settings in the end. Alltogether 14 students were working on this task. Out of 14 students only two were male students. And all the students studied Management of Tourism, either in the first or second year of study. Although the sample of respondents might seem small, for this course it is a maximum since students have to write long essays which the teacher must correct within a relatively short period to provide students with timely feedback.

3 Assessment in SLE – Writing an Article for Wikipedia

Research has shown that using Wikipedia for educational purposes, such as an assessment, is quite common (cf. [10, 11] or [12]). Furthermore, writing an entry for the online form of Wikipedia corresponds to the three essential criteria for SLE mentioned above. This assessment is context-aware since as [13] indicates, in producing a text for Wikipedia, students gain a real sense of audience and enjoy the satisfaction of seeing their work published on a high-traffic global website. When students are creating an authentic article for Wikipedia from scratch, they are not only motivated to write but begin to recognize the usefulness and necessity of the formal writing aspects of their course, e.g. the importance of attending to errors and checking facts when writing to be published. They are usually given a few guidelines as a minimum support by the course teacher [6]. These are as follows:

1. to get thoroughly acquainted with the website itself, e.g. to discover what kind of information is included, what kind of information is excluded, what is included in the footnotes . . . . . ;
2. to choose a genuine and interesting topic for their article, obviously, a topic which has not been covered in the wiki yet; if necessary to negotiate the topic with the person or institution that might be concerned;

3. to gather appropriate and relevant information on the topic and select only the most reliable and important facts;
4. to make an outline of the article;
5. to draft and revise the article a few times, preferably get someone to proofread it or to consult the facts in the article;
6. to format the source, make references and footnotes;
7. to submit the article and expect further revisions from the wiki reviewers.

Besides, the Wiki platform itself is SLE since it also provides instant support for the creation of a wiki article (for further information see [14]). And if students are still at a loss on how to edit their article, they ask their fellow students of computer science for help. In this was they also socially interact with other persons outside their group.

Furthermore, the course is run as a blended course. That means students meet a teacher once every two weeks to discuss and clarify the mistakes they made in their assignments, while at the same time, students are expected to undertake deep self-study of the materials that form their online e-Learning course. Thus, blended learning is perceived as an integration of face-to-face teaching and learning methods with online approaches [15]. This form of learning is quite popular among the students as several research studies conducted at FIM have already shown [16, 17] or [18]. Students have enough time for writing their assignment. Moreover, they can write it independently on time and location. That means it is adaptive to personal factors, such as students' learning styles and behaviour. Figure 2 below then demonstrates which days during the semester students accessed the online course and were the most active and how many times they accessed the course on the particular day. In addition, Fig. 3 is then more specific about the days of the week during which students were active at most. As Figs. 2 and 3 below illustrate, students were the most active on Mondays and Tuesdays. The reason is that Tuesday was the deadline of submitting their assignments. Figure 4 also indicates that students usually studied and wrote their assignments between 7p.m. and 10p.m. This is the time when students habitually finish their daily routines and can concentrate in the cosiness and peace of their home at more complex issues which require more time.

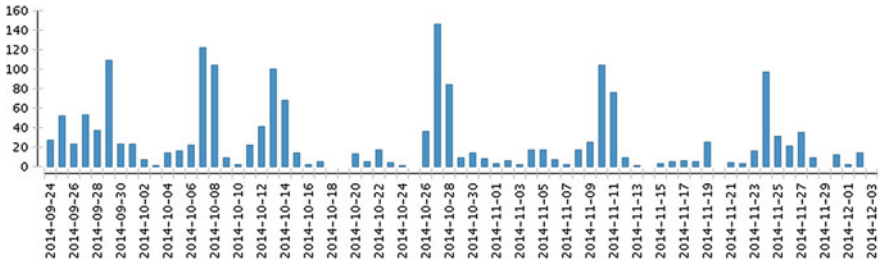

Fig. 2 Overall students' access in the course of the whole semester [19]

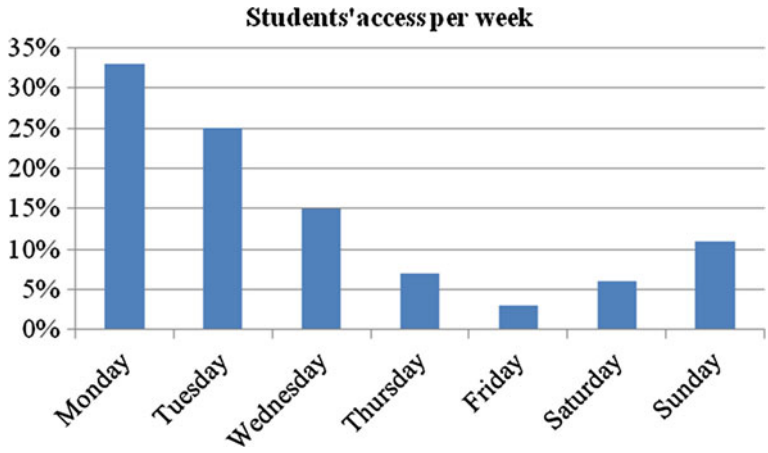

Fig. 3 Students' access per day of the week (author's own source)

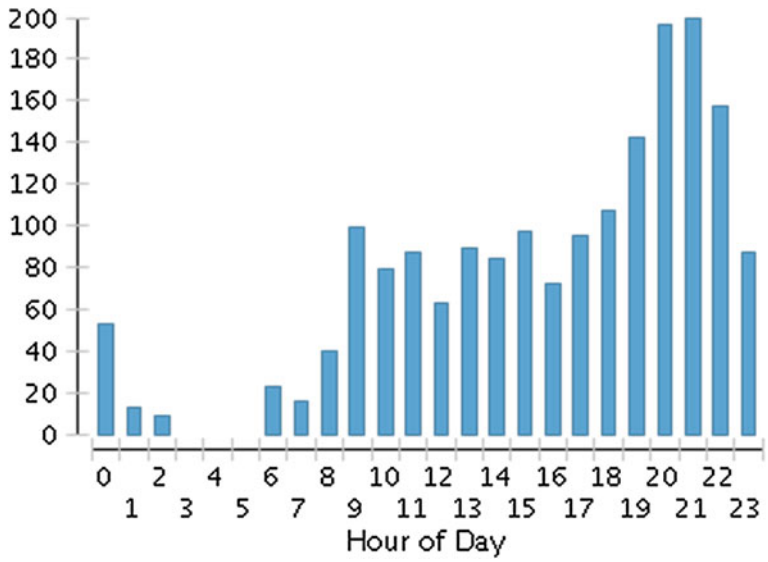

Fig. 4 Students' access per hour of the day [19]

In addition, in the Course of Academic Writing students write a self-reflective essay during the last contact lesson which is not part of their course evaluation. Students are just asked to reflect on what they have learned and experienced in the course in order to help improve the course, including the teacher's performance in the course. They are given a few guiding questions, but they do not have to follow

them if they do not want to (see Appendix 1). They sometimes also mention the assignments. Thus, writing an entry for Wikipedia seems to be the biggest challenge and also the most difficult task for them. As one of the students put it:

> The greatest challenge for me was editing the Wikipedia article, it was quite difficult and I did not find much help on the Internet. However, in the end I was more proud of myself that I have completed this homework.

Nevertheless, no matter how difficult this task was, all students succeeded in completing and submitting it as a text into the online course as Fig. 5 partially shows below. After having their article checked and approved by their teacher, they had to upload into the online version of Wikipedia. See Fig. 6 for an example.

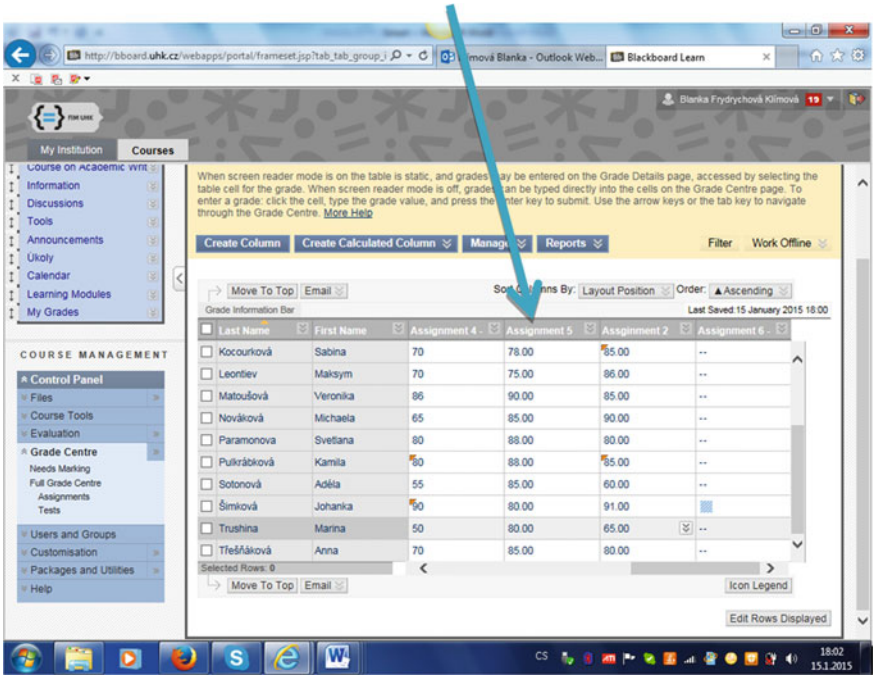

Fig. 5 Assignment being submitted into the online course to be checked by the course teacher [20]

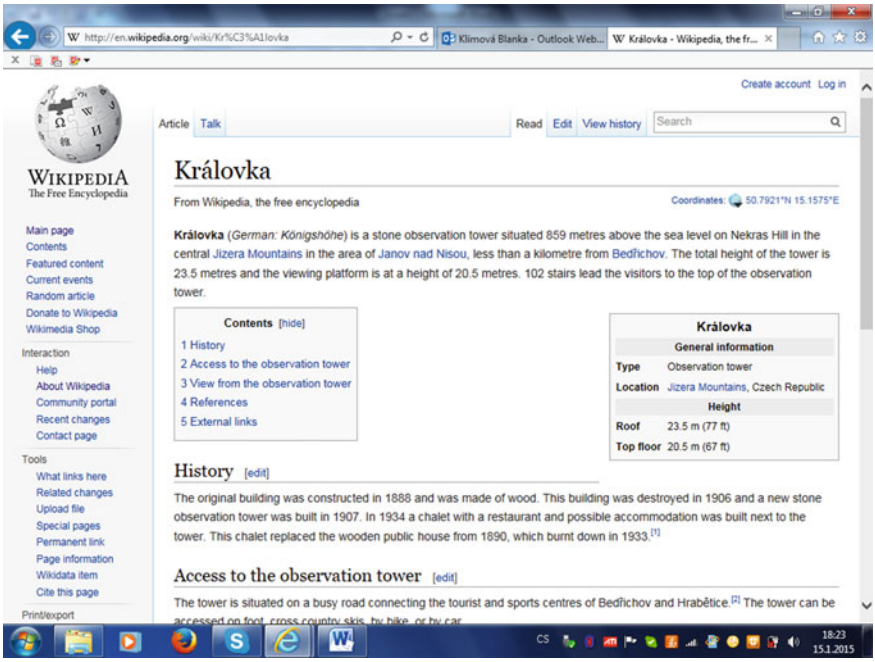

Fig. 6 An example of a student's article for Wikipedia [21]

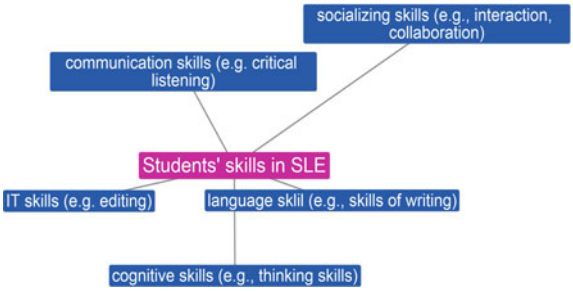

Fig. 7 Students' skills in SLE (author's own source]

4 Conclusion

As this case study shows, technology-supported learning environment, appropriate support and adaptations can generate smart students who are able with a minimum support submit real-world assignments, such as an article for the online version of Wikipedia. Figure 7 below then summarizes relevant skills students need to succeed in solving SLE assignments with a minimum support from the teacher.

Appendix 1 – Guiding Questions for a Self-Reflective Essay

1. What did I actually achieve while attending this course? Which were the most difficult parts, and why were they difficult for me? Which were the most straightforward parts, and why did I find these easy?
2. How have I developed my knowledge and skills?
3. What were three greatest challenges in doing this course?
4. What was the most boring or tedious part of doing this course? What are your recommendations for a possible improvement?
5. In what way did this course help me in my future learning and career?
6. Did you find the online course useful, not useful?
7. What advice would I give a friend about to enrol in this course?
8. What have I learned about myself while doing this course? [22]

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