Understanding learners' needs. Exploratively utilized learning analytics on students' experiences during blended teamwork process - Abstract

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Abstract

We combined learning design and data collection to utilised Learning Analytics through reflective learning tasks during the blended learning process. Self-efficacy beliefs in relation to course satisfaction and blended learning elements we explored. Exploratively utilized Learning Analytics deeper understanding of learners' needs and offers tools for developing learner-centred blended learning courses.

Keywords

Explorative Learning analytics, Student experiences, Blended teamwork, UAS students, Self-efficacy

1. Background

Implementing meaningful learning necessitates a deeper understanding of learner experiences and learning needs. Study modules becoming even more diverse and blended, with pedagogical and technological variations [1,2] as well as increased heterogeneity of the student population poses challenges to course design. Learning Analytics (LA) offer tools for teachers and pedagogical designers for approaching student experiences [3,4], which are affected by several factors, such as teaching methods, interaction with peers and teachers, technology, coordination, assessment as well as student-related characteristics.

The Society for Learning Analytics Research defines learning analytics as the measurement, collection, analysis and reporting of data about learners and their contexts. The utilisation of LA is seen as understanding and optimising learning and the environments in which it occurs. One of the most popular goals of LA include supporting quality of learning and teaching by providing empirical evidence on the success of pedagogical innovations. To increase awareness of student's experiences during the learning process, we see data collection as an important and integral part of learning design so to analyse and report learner's experiences during the course, for example.

Increased attention should be paid to students' satisfaction which is known to relate to successful learning [5,6]. One indicator for satisfaction is Net Promoter Score (NPS) [7], which is used to indicate willingness to recommend a course to fellow students [6]. Also, self-efficacy beliefs are identified as core factors affecting learner experiences, as well as one's ability to overcome challenges [8,9]. Strong self-efficacy beliefs and positive learner experiences have been acknowledged to predict future learning success [10]. LA can be utilized as LMS data on tracking and monitoring student activity and learning process [5].

In this study we used LA exploratively to extract knowledge from a blended learning course. The course is a mandatory part of the degree programs for first- and second-year undergraduate bachelor UAS students (2020 total N of students 473) representing multiple study programs. The study focused on the teamwork phase of students working in teams coached by teachers. Data was generated as a

part of university students' reflective learning tasks within a Moodle environment and concerned the blended learning elements applied during an intensive study week. The data generated from learning tasks was visualized in Moodle and available during the studies for both teachers and students. Students (n=353) were selected for the study in which data from their reflective learning tasks during the week as well as their self-efficacy beliefs [11] and course satisfaction [6] the end of the week were explored.

2. Research questions

1. How can information from blended learning processes (elements) be collected and utilized to **understand learner experiences** and **satisfaction**?

2. How can knowledge on students' **self-efficacy beliefs** in relation to **course satisfaction** and **blended learning elements** be applied in the development of blended learning processes?

3. Methods and analysis

Within learning tasks, the students assessed various blended learning elements such as teaching, materials, teamwork as well as their feelings towards teamwork and their own competence and actions. All personal information was removed prior to the analysis phase. Self-efficacy beliefs (HowULearn [11]) and NPS-metrics were included in the final learning task. Likert-scales ranging from 1 to 5 was used for rating items, except the daily feelings which was rated on scale 1 to 3.

In analysing students' self-efficacy beliefs, the statements of self-efficacy beliefs of the HowULearn questionnaire [11] were used. Based on students answers to these five statements the average sum variable of self-efficacy beliefs (SES) was formed, with the higher SES corresponding to higher self-efficacy beliefs. The students were divided into three groups based on their SES [12].

NPS –method (Grisaffe, 2007) was utilised as an indicator of students' course satisfaction with a question of willingness to promote a course. Adapting the NPS-method [6] to explore course satisfaction, responses were sorted into 3 NPS-categories. Classified NPS-categories and continuous NPS-responses were used in the statistical review depending on the method.

Descriptive statistics were used to analyse students' experiences and satisfaction of teamwork and blended learning elements in SES groups collected daily. Exploratory graphs, such as boxplots and bar charts were used to develop a deeper understanding of the data. The supposed dependence between SES and NPS-responses were examined using Pearson's correlation test. In addition, the supposed dependence between SES and blended learning elements was also reviewed with Pearson's correlation test.

4. Results

Based on information extracted from students' learning tasks, it was acknowledged that student experiences of blended learning elements varied during the teamwork phase with different SES. A growing trend in positive experiences of blended learning elements in different SES can be identified. The daily satisfaction about team's work were experienced emotionally differently and daily satisfaction varied, however the trend remained similar between different SES.

Relations between blended learning elements and SES were found ($.171 < r < .464$, $p < .001$), except in the teaching element in which correlation was not found. In addition, positive correlation between SES and course satisfaction was found in SES groups, students with lower self-efficacy beliefs were more dissatisfied with the course ($r < .185$, $p = 0.42$). Positive correlation between SES and course satisfaction was found ($n = 312$, $r = .159$, $p = .005$), while students with maximum SES of 5 were excluded.

5. Conclusions

Exploratively utilised LA was successful in gathering information on university students' experiences through reflective learning tasks during the blended learning process. Students' daily experience variations could be utilised as indicators for teachers to target their attention to and find key elements to develop blended learning processes. It is important for teachers to become aware of blended learning elements relating to course satisfaction and self-efficacy beliefs as well as their connections. The findings on correlations between self-efficacy beliefs and blended learning elements and satisfaction requires teachers to rethink ways for learner empowerment. The questionnaire also included a few open-ended questions which have not been analysed at this stage. However, it is to be presumed that an examination of these questions will deeper understanding of learners even further.

Using learning tasks as a data source of visualizations for teacher and the students made the use on LA transparent. This would enable teachers to use LA for formative purposes to aid teachers e.g., identifying a team's need for support. Learner generated data as LMS dashboards during the course may offer teachers (and students) excellent opportunities to acquire in-depth understanding of student experiences [13]. A deeper understanding of students' needs through LA offers tools for developing learner-centred blended learning courses, thus contributing to success in learning.

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