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Motivating Course Concept: Using Active Labs For BPM Education

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MOTIVATING COURSE CONCEPT: USING ACTIVE LABS FOR BPM EDUCATION

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Abstract

While there is a need for business process management professionals in economy, enrolment in IS programs is declining. The resulting gap is even widened by early terminations of students due to various reasons. Missing motivation, as one of these reasons, is tackled by the Active Lab course concept presented in this paper. Such Active Labs are inspired by Social BPM Labs, which represent course units for experiencing business process modelling in a collaborative environment. First feedback related to Social BPM Labs indicated a positive effect on students' motivation. To leverage this outcome, during an Active Lab theoretical contents are combined with practical application and current research topics. Furthermore, the usage of active learning techniques like problem-based learning or role-play simulations is proposed to foster students' engagement with the ultimate goal to raise their motivation and thus reduce drop-out rates. Additionally, functionalities of a software platform are sketched that will support the planning, preparation, execution and evaluation of Active Labs. This concept is currently under development at the Karlsruhe Institute of Technology (KIT), hence the presented results are still subject to change.

Keywords: Course Concept, BPM Education, Active Lab, Active Learning

1 Introduction

Despite the ever-growing global IT industry keeps raising the demand for professionals with strong business and technical skills, it has been established that Information Systems (IS) programs experience decreasing enrolments (Granger et al., 2007). Amongst others, an accepted strategy to address this challenge is the redesign of curriculum with the aim to integrate up-to-date and relevant course content. In addition to the declining enrolment for IS programs, a significant amount of students drop out of their studies without graduating. This further negatively affects the number of educated people which hold a university degree in IS and related disciplines. A recent study reports a dropout rate of 35% for German university bachelor programs (Heublein et al., 2010). Research on possible causes for dropout has identified four main reasons: achievement problems (31%), financial issues (19%), motivation (18%) and study conditions (12%) (Heublein et al., 2010). Hence, those reasons need to be explicitly addressed in order to mitigate the effect of university dropout rates.

Alongside information systems, business processes have become the backbone of most organizations and as a result, skills in the area of Business Process Management (BPM) are highly demanded by enterprises (European Commission, 2009). According to Pal and Sen (2011), it is important to include BPM in the IS program curriculum to prepare graduates for the competition in the changing job market. This paper presents a novel approach to teach BPM at universities with so-called *Active Labs*.

The main aspects behind the Active Lab concept are the combination of theory, practice and research with active learning techniques to foster students' engagement. Active engagement has been determined as a positive factor for student's motivation and learning achievement (Waite and Davis, 2007). The lab concept also comprises other relevant measures addressing reasons for university dropout and involves the utilization of popular social media. Courses like Active Labs might thus contribute to keep existing students as well as attract prospective students with its innovative teaching method. The Active Lab concept is not content-specific and thus applicable beyond BPM, e.g. in conjunction with other courses of the IS program curriculum.

The remainder of the paper is organized as follows. Section 2 introduces *Social BPM Labs* as the foundation of Active Labs and presents first evaluation results. Afterwards the abstract concept of Active Labs is presented together with a sketch for a BPM-specific implementation. Section 4 covers related work in the area of BPM education. Finally, section 5 concludes the paper and gives an outlook onto future research directions.

2 Social BPM Lab

A Social BPM Lab is a teaching concept developed and organized by Horus software GmbH (<http://www.horus.biz>) which has been initially conducted in cooperation with the Karlsruhe Institute of Technology (KIT) and Hochschule Konstanz University of Applied Sciences (HTWG). During a Social BPM Lab, participating students combine their theoretical knowledge from lectures with a practical business case. This concept is based on the understanding that business process modelling is not the task of an individual or a selected group but is a responsibility of a whole business community, which consists of the entire enterprise and possibly all involved business partners. Thus, BPM itself becomes a collaborative process, and its quality largely depends upon the quality of collaboration in terms of work efficiency and quality of results (Schönthaler et al., 2012).

Recent research indicates that the involvement of all stakeholders in a business process, whether they are internal employees of an enterprise or employees of partner companies, seems to have a positive impact on model quality (Rittgen, 2012 or Forster and Pinggera, 2012). Thus, the goal of business process modelling, as it is understood in the following, is not only to create business processes but also to use the knowledge of an entire business community while modelling processes. In addition to the

sociological components, the communication possibilities within the business community play a key role here. To support collaboration and knowledge sharing between lab participants, the idea of integrating social software into the modelling process is picked up, e.g. wikis, blogs or video conferencing software (Mathiesen et al., 2012). The Horus Enterprise product line was made available to all lab participants. These tools have been chosen as they support the Horus Method (Schönthaler et al., 2012) which is applied during the lab and offer the required modelling environment and social software components¹ to the students. The general aim is to let students experience the practical use of collaborative BPM.

2.1 Execution

So far, KIT students participated in four labs. The last one (2nd International Horus Social BPM Lab) took place on November 09, 2012 with 163 participants at 12 globally distributed locations including universities from Russia, Switzerland and Germany.

Students collaborated in a social network to define business processes, strategies and objectives of a fictitious enterprise. The corresponding use case was introduced to the participants, followed by formation of groups responsible for different objectives, e.g. modelling a business process adhering to restrictions imposed through interfaces with other business processes or defining a business strategy for the use case enterprise. In essence, these groups had to achieve their objectives in collaboration with other groups with the help of the modelling environment Horus. The groups itself were spread across the different globally distributed locations. Students were forced to collaborate to solve their tasks. Collaboration included the usage of chat software, a wiki to supply all groups with resources and results as well as video conferences to present outcomes. As a result, many detailed business process models were created within a few hours through collaborative work.

2.2 Feedback

During the final lab hour, all students were asked to submit feedback about their experiences. To this avail, a short online survey had been created which could be completed anonymously using a web browser or smartphone. For the survey, an online tool provided by Honestly MT GmbH (<http://www.honestly.de>) was utilised. The intention of the survey was to gain first insights about the positive and negative aspects of a Social BPM Lab but no in-depth statistical analysis has been conducted yet. Future plans include extending the evaluations to be statistically sound.

The questionnaire was divided into sections with series of statements which could be rated using a 5-point Likert-scale ranging from “I strongly disagree” (1 point) to “I strongly agree” (5 points). Additionally, each section was closed with a free-text field to allow for individual remarks. General information like educational status, gender and location of the lab group was gathered in an initial section. Voluntary free-text fields to collect information regarding the questions what students liked about the lab and what could be improved were also included.

68 questionnaires were completed, thus yielding a response rate of 42%. 42 students gave voluntary feedback on what they did like about the lab. Answers were e.g. “The interaction between people from different locations & the actual industry scenario for modelling was very interesting.” [sic], they appreciated “to exchange knowledge with other students” [sic] or they liked the “social collaboration” [sic] during the lab. Reasons might be that they feel comfortable using social software as students tend to use it in their daily lives. At this time, this aspect has not been covered within the evaluation and its impact on learning will be investigated further in the future. Actually, with 71%, a clear majority of those feedback statements express a positive experience with the lab’s collaborative and teamwork

¹ A detailed description can be found on <http://www.horus.biz/en/horus-iinsidei/performance-range/horus-enterprise.html>

aspects. A majority of students stated that the lab helped them to gain new theoretical as well as practical knowledge (Figure 1, 1a, b). Moreover, the results to statement 1c give evidence that many students perceive the lab as a factor contributing to a better understanding of the connection between practical and theoretical aspects of BPM. In addition, the lab has contributed to increase the interest in the field of BPM for the majority of participants (Figure 1, 1d).

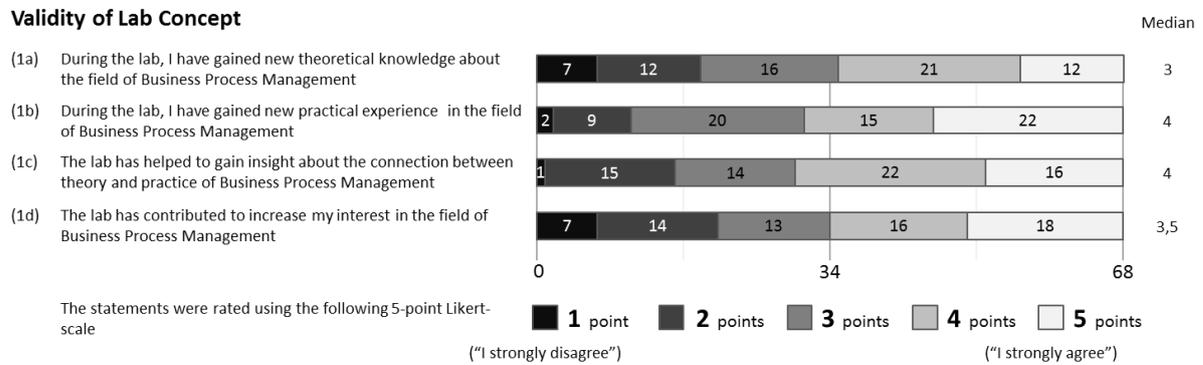


Figure 1: Results of selected questions in the explorative feedback survey.

3 Active Labs for BPM Education

According to the feedback presented in the previous section, Social BPM Labs, at least subjectively, help students to understand the applicability of theoretical knowledge and strengthen their interest and motivation. Motivation in turn leads to a decreasing dropout rate of university students according to e.g. Brewer and Burgess (2005) or Heublein et al. (2010). Thus, the Social BPM Lab might already make a small contribution if included in IS program curricula. However in its current form, it is limited to a one-day event and the aspect of business process modelling. By picking up the experiences with the Social BPM Lab, an extended concept for so-called Active Labs is presented in the following paragraphs and subsequently, a preliminary BPM-specific implementation is sketched.

The main objective behind the Active Lab concept is to offer a dedicated course for first-year students with the goal to decrease drop-out rates. The concept itself is not content-specific and aims at addressing mainly one important reason for university drop-out: missing motivation. Through participation in an Active Lab, students' motivation should be increased by experiencing the relevance of basic theoretical knowledge. This is realized by explicitly integrating the practical application of theoretical knowledge into the course content, e.g. through conduction of a Social BPM Lab. An Active Lab includes examples for practical application from both the fields of industry and academia. Examples from the field of academia covering current research topics should be derived in close coordination with the research interests of the supervising academic staff to provide opportunities for early participation of students in research activities. By embedding those fields, students get a comprehensive picture about future directions and possibilities they obtain by achieving a university degree. Furthermore, in Active Labs students will be equipped with the necessary theoretical background knowledge through the utilization of motivating and engaging active learning techniques like e.g. problem-based learning (Barrows, 1996) or role play simulations (DeNeve and Heppner, 1997). In their trend report prepared for the UNESCO 2009 World Conference on Higher Education, Altbach et al. (2009) document the need for teaching approaches which involve students actively in the learning process and a paradigm shift to more student-centered teaching approaches. They also describe the trend away from teaching declarative knowledge (memorize and regurgitate) to imparting functional knowledge (know how to apply theory to practical situations). This philosophy is exactly in line with the Active Lab concept. Additionally, achievement problems as another important drop-out cause are indirectly tackled as the Active Lab can be seen as a remediation procedure for academic

problems. Shapiro (2011) reports that “the time during which students are actively rather than passively engaged in academic responding, or *engaged time*, has a long and consistent history of finding significant relationships to academic performance”. Besides, the Active Lab will also address achievement problems directly through a basic training of academic skills like literature search and methods of knowledge acquisition. Research methods and scientific work should be part of this comprehensive training to prepare students for the upcoming challenges during university education.

During an Active Lab, students create a lot of digital material in blogs, wikis and also video webcasts which can be disseminated to prospective students on special information events. This can be seen as a measure to address the problem of university dropout before enrolment. By obtaining first-hand impressions from actual students, prospective students might develop more realistic expectations which prevent future disappointment and dropout, i.e. they know more precisely what to expect of a study program and choose respective programs which suit their abilities.

In the remainder of this paragraph, a preliminary draft of Active Lab contents for BPM education is presented. This draft should be seen as a first step towards a comprehensive Active Lab for BPM, as it focuses on business process modelling and aims at complementing the Social BPM Lab with corresponding theoretical knowledge. The book of Schönthaler et al. (2012) serves as foundation to derive the theoretical body for the course as it covers the Horus Method which is used in the Social BPM Lab. Topics include modelling in general, Petri nets, object and organization models and the Horus Method including several analysis steps (e.g. context-, strategy-, risk or SWOT-analysis) which guide the modelling process. To realize the application of this theoretical knowledge in practice, the Social BPM Lab as described in section 2 is integrated into the course. Examples regarding research topics currently include Social BPM in general, Process Mining, Semantic Business Process Modelling and visualization strategies for process-related information whereas this selection is based on the active research interests of the currently involved academic staff. A partial implementation of the Active Lab sketched here will be conducted in several sessions during 14 weeks in the summer term 2013. A selection of the above topics will be assigned to teams of three students. Based on the given topic along with appropriate material and a row of resources with collections of active learning techniques (like e.g. Methopedia: <http://en.methopedia.eu>), each team has to decide on a specific technique to present the topic in an engaging and activating manner to the other teams. While this does not correspond to the original Active Lab concept, the idea behind this approach is to let students create course units as combinations of content and learning techniques by themselves. These units can be reused in future instances of the course. The students will apply their theoretical knowledge while participating in the 3rd International Horus Social BPM Lab taking place on July, 15th, 2013.

To support the planning and conduction of Active Labs, the implementation of a dedicated software platform is under development. A collection of individual active learning techniques, teaching methods, best practices and course elements is put together in a didactic repository. Additional repositories will offer service (e.g. wiki, forum, chat) and administration (e.g. user management) functionalities. The platform backend will provide a course modeller which can be used to select and orchestrate the elements of the different repositories in order to aid and design a specific Active Lab. An integrated evaluation module serves as instrument to rate the didactic methods and furthermore ensure didactic quality. It will also provide a basis to analyze the extent to which the Active Lab concept meets its goals, i.e. measure motivation of the participating students. Currently, a well-founded methodological approach to empirically study the effects of participation in the Active Lab is developed. It is based on previous work, e.g. Mayer (2011), with the aim to study motivated learning.

4 Related Work

Basically there are two different types of work which have to be considered regarding Active Labs: (i) technical and subject-specific resources covering the selection of appropriate course content and (ii) approaches from a pedagogical field describing didactic methods which can be used to deliver the chosen content.

Regarding the selection of appropriate course content, resources for BPM and process modelling education are relevant in the scope of this paper. Various contributions to this domain have been made by e.g. zur Muehlen (2008), Bandara et al. (2007, 2010), Recker and Rosemann (2009) or Ravesteyn and Versendaal (2010). Their work offers valuable hints for the design of an Active Lab for BPM education and is currently analyzed for possible adoption and implementation in future Active Lab instances. E.g. the BPM courses described by Bandara et al. (2010) and Recker and Rosemann (2009) each cover multiple process modelling languages including Event-driven Process Chains (EPC) and Business Process Model and Notation (BPMN) whereas the preliminary draft of Active Lab contents for BPM education currently only includes Petri nets. This will be considered in future extensions.

Due to the sheer amount of didactic methods from the field of pedagogy and the space constraints upon this article it is not possible to cover an exhaustive selection of suitable approaches which can be employed during Active Labs. An intensive examination of collections representing modern teaching methods with a focus on student-activating techniques is currently conducted. Additionally, the transfer of promising approaches from other disciplines to the field of BPM education is investigated.

5 Conclusion and Outlook

Due to positive feedback regarding motivational effects of a Social BPM Lab the underlying approach has been extended to address the high university dropout rates in German bachelor study programmes (Heublein et al., 2010). In the resulting Active Lab concept theoretical contents are combined with their practical application and current research. In respect of the teaching style active learning techniques are proposed to raise students' engagement. This basically means that Active Labs equip students with theoretical knowledge in an engaging manner while embedding practical examples from both industry and academia. This should ultimately lead to an amplified positive effect on students' motivation which might in turn reduce university dropout rates, although these consequences need to be evaluated in the future. While this Active Lab concept is generally applicable for various topics a first course from the field of Business Process Management is sketched.

Topics for the future include (i) further adaptations to the teaching concept by incorporating opinions of cooperating researchers from education science and insights from evaluations, (ii) in depth evaluations of the impact of the Active Lab concept on students' motivation and dropout rates and (iii) design and implementation of a software platform supporting the planning, preparation, execution and evaluation of labs.

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