

# Collaborative Teaching of ERP Systems in International Context

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**Abstract:** ERP systems are characterized by a high degree of complexity what is challenging to replicate in the classroom environment. However, there is a strong industry demand for students having ERP training during their studies at universities. This paper reports a joint effort of University of Rostock and Riga Technical University to enhance introductory ERP training by introducing an internationalization dimension in the standard curriculum. Both universities collaborated to develop an international ERP case study as an extension of the SAP ERP Global Bikes Incorporated case study. The training approach, study materials and appropriate technical environment have been developed. The international ERP case study is performed at both universities where students work collaboratively on running business processes in the SAP ERP system. Students' teams at each university are responsible for business process activities assigned to them and they are jointly responsible for completing the process. The case study execution observations and students' evaluations suggest that the international ERP provides a good insight on the real-life challenges associated in using the ERP systems in the international context.

## 1 INTRODUCTION

Enterprise Resource Planning (ERP) systems are one of the most widely used large-scale information systems (Shehab et al., 2004). They are used primarily by large international companies operating in many countries with different regulatory requirements and regional and cultural differences (Markus et al., 2000). Given importance of the ERP systems, higher education establishments have incorporated them in study programs (Hepner and Dickson, 2013). A range of training materials has been elaborated very often with a help of vendors of the ERP systems. However, the traditional teaching materials lack the international dimension and often follow a one-user-does it all approach. As a result, students are able to complete long-running multi-role cross-organizational processes in a relatively short time and ignoring permissions associated with various roles. Therefore, they do not gain a good understanding of the ways processes are executed in practice. Additional, the traditional teaching materials often focus on step-by-step instructions reducing a need for in-depth exploration of the features of the ERP systems and dealing with potential pitfalls.

This paper reports a collaborative effort by University of Rostock (UR) and Riga Technical University (RTU) to provide ERP teaching in the international environment. The objective of the paper is to elaborate an international ERP teaching case and to reflect on initial experiences in collaborative studying of the ERP systems.

The international ERP case is used for practical exercises in a study course devoted to enterprise applications or business information systems. The course is given to both computing and business students and focuses on functional aspects of the ERP systems. A sales and distribution process performed by organizational units in different countries is at the core of the case. The SAP ERP system is used for executing the international sales and distribution process. The case is developed as an extension of the standard SAP training material using the GBI case study (Magal and Word, 2012) and students have knowledge of the standard case prior starting the international case. This way the international ERP is a natural continuation of previous exercises and the students work in the familiar environment. The other key principles used in the design of the international ERP case are usage of structured case execution instructions instead of

the step-by-step type of instruction to facilitate inductive learning (see section 3.2). Student groups located in different countries are jointly responsible for the case execution and a joint troubleshooting is promoted to facilitate peer learning. The sales process is executed in an asynchronous manner to resemble real life business operations where partners do not respond immediately.

The main contribution of the paper is development of the didactical approach to studying ERP systems in the international environment and elaboration of a new type of template for presenting case studies and training instructions. The didactical approach is based on a mix of deductive and inductive teaching approaches including collaborative work by teams of the students in different countries. The template for presenting training instructions is based on using structured task specifications rather than step-by-step guides.

The rest of the paper is organized as follows. Section 2 reviews related work on ERP studying. The extended international ERP case including the teaching approach is presented in Section 3. The technical approach is described in Sections 4. Section 5 reports initial case study execution experiences and Section 6 concludes.

## 2 LITERATURE REVIEW

Boyle and Strong (2006) have identified skill requirements of ERP graduates. The skills are categorized as ERP technical knowledge, technology management knowledge, business functional knowledge, interpersonal skills and team skills. The international ERP case focuses developing skills systems design/integration, knowledge of business functions, ability to understand the business environment to interpret business problems, ability to accomplish assignments, ability to be proactive, ability to work cooperatively in a team environment. More importantly ERP skills have direct impact on ERP implementation success (Mohamed and McLaren, 2009).

Hepner and Dickson (2013) provide a summary of business processes taught using ERP-integrated curricula and an ERP curriculum assessment. They focus on value of ERP-integration. Hayes and McGilsky (2007) report on introducing ERP systems in the business core courses. They specifically emphasize importance of developing training curriculum and faculty competences showing that the standard materials are a good starting point and these can be later on elaborated for specific needs.

An ERP simulation game is one of the ways of illustrating characteristics of ERP systems, especially, to business students (Cronan et al., 2009). The game focuses on comprehension of conceptual foundations of the ERP systems. Léger (2006) implemented a turn-based simulation game approach for both undergraduate and graduate business administration students focusing on information technologies. The students were running five national companies during this simulation, which sell their products independently on three different marketplaces. The affected processes were: procurement, production and sales.

Cronan et.al. (2012) compared two different methods — an objective measure and a self-assessed one — to measure cognitive learning effects in an ERP simulation game. To obtain knowledge about ERP systems and business processes a simulation game is more appropriate than other learning types like lab exercises or lectures as Cronan et. al. pointed out. Theling and Loos (2005) proposed a multi-perspective approach to teach ERP systems to take into account that different roles were involved. They integrated four different perspectives on ERP systems in their curriculum like software engineer's, software consultant's, business analyst's and end-user's view. The hands-on experience was given by a case study using standard learning material provided by SAP. Monk and Lycett (2011) described a work in progress multi-method approach to measure the effectiveness of ERP teaching. They combined a quantitative analysis of an experimental simulation game using a t-test and a qualitative analysis of interviews about the gained knowledge. They run their simulation game both in the UK and the US.

Dealing with complexity of ERP systems is a major challenge in studying ERP systems. Hussey et al. (2011) propose a methodology for facilitating active learning so that students can attain in-depth understanding of the ERP systems. O'Sullivan (2011) perceives usage of ERP systems as a way of bringing in real-world tools and experience in the classroom. ERP training can contribute to development of a wide range of professional skills for engineering students (Moon et al., 2007). International collaboration is shown to be particularly beneficial. Although modern information systems are used in the global context, information systems curriculum often does not follow the suite (Pawlowski and Holtkamp, 2012). The internationalization framework proposed in that paper emphasizes importance of collaboration, communication and project management to achieve

curriculum internationalization objectives.

Chang et. al. (2011) investigated the influence of post-implementation learning on ERP systems. They used a cross-sectional mail survey including 47 companies for their quantitative research. The number of returned questionnaires was 659. The main finding is that post-implementation learning has a significant influence on ERP usage including the dimensions like decision support, work integration and customer service. Furthermore, Chang et.al. showed that ERP usage has also significant effects on individual performance including areas like individual productivity, customer satisfaction and management control.

The literature survey provides evidence that ERP training plays an important role in information systems curriculum. The training has to provide a wide range of skills and internationalization is one of major challenges. Capturing complexity of using and developing large scale information systems is also important and challenging in the classroom environment. According to our literature research there is no cross-country collaborative case study using an ERP system including a setting with multiple roles and limited permissions in order to deepen the students' knowledge on cross-organizational business processes. This applies also to ERP systems taught by double loop learning and peer learning.

### 3 DESCRIPTION OF THE CASE STUDY

The international ERP studies are implemented as a collaborative effort between Riga Technical University and University of Rostock. The international ERP case is designed for business informatics and information technology students as an introduction in ERP systems. It is based on the standard GBI case provided (Magal and Word, 2012). The standard case is extended for application in the international environment.

#### 3.1 Teaching Environment

The international ERP is a part of courses devoted to introduction to ERP systems. At RTU, the ERP Systems course is given to master students in the Information Technology study program. At UR, the course is given to both Master students in Business Informatics and students in the "Service Management" program which leads to a Master degree in business administration. The Information

Technology as well as Business Informatics study programs deal with application of ICT in business environment and the ERP systems is one of the key aspects of using ICT at companies. The introductory ERP courses at both universities focus on general characteristics and functional aspects of the ERP systems. This founding knowledge is used as a prerequisite in related courses devoted to ERP development and implementation of enterprise applications.

Table 1 lists topics covered in the courses at RTU and UR, respectively. Every topic consists of lectures and practical exercises in the lab following the standard GBI curriculum. The international ERP process is executed as a part of the topic on ERP internationalization. This topic is given using the extended international case. It consists of an introductory overview of international ERP, independent work by students' teams of international ERP process execution and reflections on the process execution. Further details of the collaborative learning process are provided in Section 4. Completion of the international ERP process yields credits towards the final grade of the course.

Table 1: Topics of the introductory ERP courses.

RTU	UR
Enterprise business processes	Process-oriented organizations
General characteristics of enterprise applications	General characteristics of information systems in enterprises
Data in ERP systems	ERP systems
Sales and distribution process	Sales and distribution processes
Financial accounting processes	Material management processes
Sales and financial accounting integration	Financial accounting processes
Production and inventory management processes	Integration of business processes
ERP internationalization	Electronic business in general e-procurement

The specific learning objectives for the international ERP case are:

- Strengthening general ERP usage skills
- Strengthening knowledge of the sales and distribution process
- Ability to track the process execution progress
- Improving communication skills and foreign language skills
- Business process execution in the collaborative setting

- Understanding of roles and user permissions in ERP systems

The learning objectives relate to the required ERP skills as identified by Boyle and Strong (2006). The ERP usage skills and knowledge of the sales and distribution process are strengthened by the need to go beyond standard tasks described in the step-by-step instructions. The process execution progress should be tracked to ensure communication among the distributed teams and to comply with the reporting requirements. The student teams work together thus improving their teamwork skills reinforced by working in the international environment. By using the structured case requirements and instructions, the students also learn about design of ERP implementation artefacts. The technical objective of understanding roles and permissions in the ERP systems is achieved by limiting a number of functions each student team can perform.

### 3.2 Teaching Method

From a teaching perspective, the selection of methods and instruments started from the learning outcomes the international case study was supposed to establish. These learning outcomes are presented in Section 3.1. Learning outcomes are what the students can reliably demonstrate at the end of the module, i.e. what can be assessed in exams or is manifested by oral presentation or written documentation of the students' results.

Traditional engineering instruction usually follows a deductive approach, which starts with theories introduced in lectures or homework and progresses to the applications of those theories. Alternative teaching approaches are more inductive and include methods, such as problem-based learning, project-based learning or case-based teaching (Prince and Felder, 2007). As inductive teaching methods are found to be more effective than traditional deductive methods for achieving a broad range of learning outcomes (Prince and Felder, 2006), we decided to combine deductive and inductive approaches. Teaching in the international case study started with a deductive part: lectures introduced the relevant theoretical background; homework of the students was directed to read additional material; the material was discussed in question-answer sessions at the beginning of the next lecture. After the deductive part, the inductive part followed manifested in case-based teaching (see also Section 4.4).

When planning the teaching method, we also

took into account that in particular in ICT there is a tendency to a competence perspective on personal qualification, as manifested in the European e-Competence Framework (CEN 2014). The term competence is defined by the e-CF 3.0 as: "Competence is a demonstrated ability to apply knowledge, skills and attitudes for achieving observable results." (CEN 2014, p. 5). Typically a distinction is made between technical, method and social competences. The technical and method competences for our teaching module correspond to the learning outcomes defined in section 3.1. However, the teaching module also has the objective to develop social competences. Social competences are difficult to express in "assessable" learning outcomes but nevertheless need to be taken into account when planning the teaching methods. For our case, the social competences are the ability to actively contribute to distributed and international group work, which includes understanding that work with partners in other locations and countries usually cannot be solely performed by using ERP systems but also requires communication with people and coordination of group work and to train the ability to coordinate problem solving in distributed teams.

In order to support the inductive part of our teaching module, we decided to support different learning situations: collaborative learning, peer learning and tutoring. Collaborative learning can be very broadly defined as "a situation in which two or more people learn or attempt to learn something together" (Dillenbourg 1999, p. 1). In our case, we formed groups of students who got a joint assignment which included initial guidelines how to proceed. Some of the advantages attributed to collaborative learning are, e.g., that students come to a more complete understanding by comparing their views with other group members, having to explain to others requires elaboration and students with better skills serve as promoters in the groups (Laal and Ghodsi, 2012).

Tutoring basically means to guide the students or group of students to the point in the learning process at which they become independent learners. Tutoring was provided by having a subject teacher from the field as "stand-by" for inquiries of the students during the course of the case study. At each university, a tutor was available who could be contacted by e-mail or visiting the tutor's office. Online-tutoring by using video-links was also possible.

Peer learning basically is the "acquisition of knowledge and skill through active helping and supporting among status equals or matched

companions” (Topping, 2005). We envisioned that peer learning situations would emerge between the collaborating groups at the two universities, i.e. that the groups from Riga would help the corresponding group from Rostock to understand issue and solve problems in the case study and vice versa. Support for peer learning was provided by offering document sharing, joint editing platforms and communication support for the groups.

For the above learning situations, computer support is provided, e.g. by providing groupware and learning management systems. The students were made aware of these instruments and used the computer support for peer learning and tutoring as part of their collaborative learning.

In order to develop the social competences, we designed the case material in a way that enforced communication between groups in Riga and Rostock, e.g. by including exceptions in the work flow which could not be remedied just by using the ERP system. Furthermore, the groups were forced to agree on an internal way of working, i.e. we did not define the “inner” roles and tasks of the teams. In

Rostock, we also formed teams with mixed backgrounds, as the participants were from business information systems (engineering-oriented) and service management (purely business-oriented) programs. The tutor actively focused on technical and method support and promoted discussions within the teams for solving communication problems or conflicts.

### 3.3 Extended GBI Case

The international ERP case is developed as an extension of the standard GBI case. It covers the sales and distribution process starting with a customer inquiry and finishing with customer payment. It is assumed that GBI has outsourced several business functions to another country. The operations in another country are performed by a business services provider on behalf of GBI. The outsourcing service provider company is called GBI BPO. GBI is responsible for the customers relationship management and billing activities, while

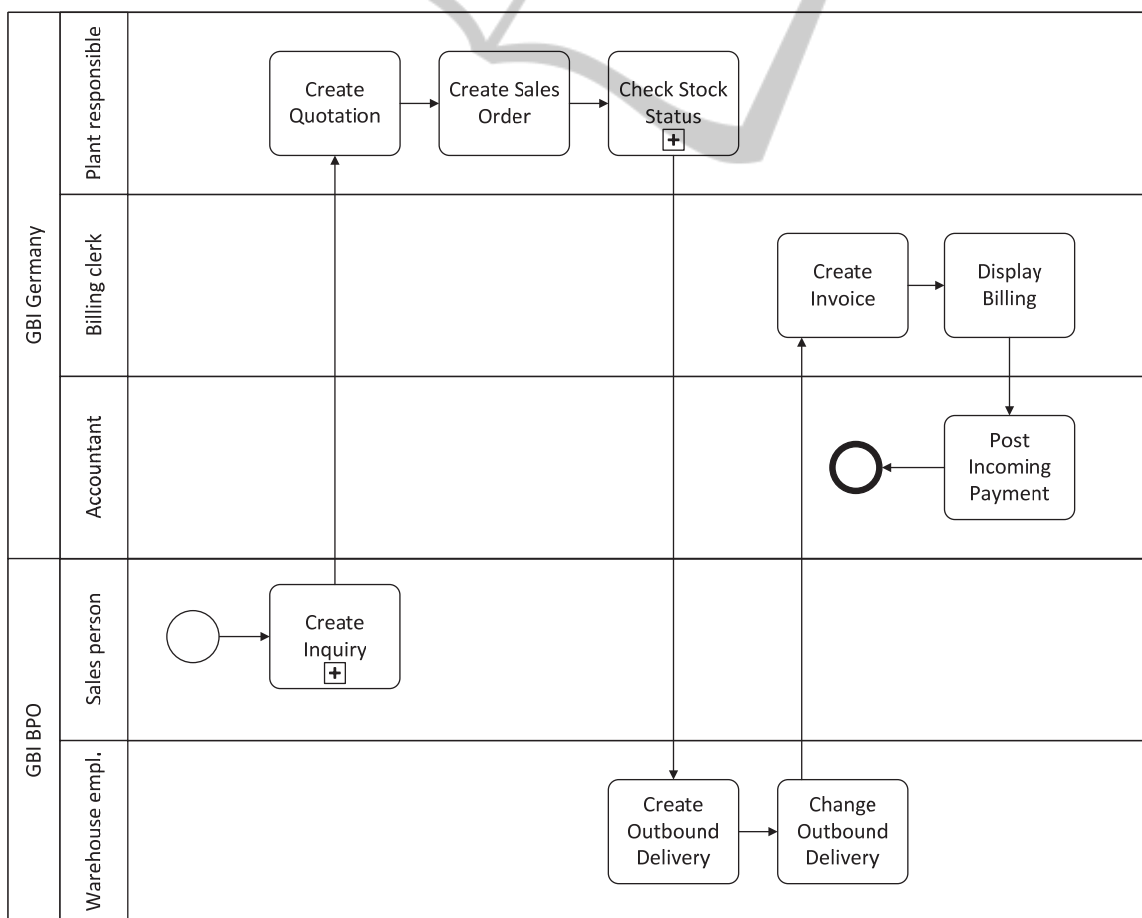


Figure 1: The international sales and distribution process.

GBI is responsible for preparing initial sales documents and the warehousing activities. Activities performed in one country depend upon activities completed in other country. The process involves Sales and Distribution (SD), Materials Management (MM) and Financial Accounting (FI) activities.

An overview of the international ERP process is given in Figure 1. The process is initiated by one of the GBI customers inquiring about buying bicycles. In the case of a new customer or changing customer contact information, the customer master data are updated. A new customer can only be created by the Plat responsible but customer data also can be changed by the Sales person. The customer also requests GBI to issue a legally binding sales question. During the process, employees use SAP ERP reporting and analytic functions to analyze the sales process. For instance, the employees evaluate the order probability of success and check the stock level. Once the customer has accepted the quotation, a sales order is created and the shipping and billing activities are initiated. The Warehouse employee creates an outbound delivery document and indicating the materials pick-up data in this document. The Billing clerk creates an invoice for the materials delivered, and the Accountant settles the invoice by posting incoming payments. If customers request products, which are currently not available in the stock, than the procurement processes should be invoked. The procurement operations are performed by GBI BPO.

#### 4 TECHNICAL APPROACH

In order to achieve learning outcomes, the standard GBI training instructions were extended and restructured, alternative variants of ERP setup were identified and appropriate user rules were created in the ERP system.

##### 4.1 Design of Instructions

Given that the students already have had an introduction into working with the ERP system following the standard GBI guidelines, the international GBI instructions are created to resemble ERP implementation specification documents rather than the step-by-step instructions. That is intended to promote self-learning and deeper understanding. At the same time, the students always can consult the standard GBI training materials.

In a fashion similar to ERP specification documents, each process activity defined using its

objective, role involved, tasks to be performed and input data.

Fragments of the instructions given to the students are shown in Figure 2 and Table 2.

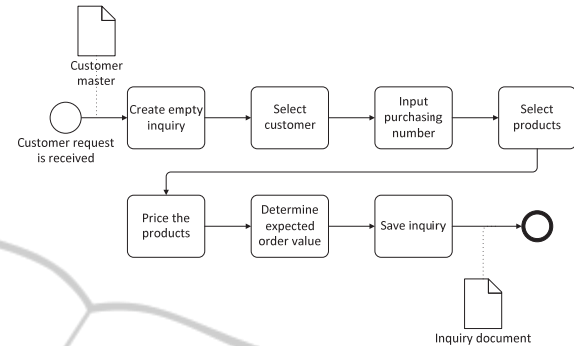


Figure 2: Elaboration of tasks of the Create Inquiry activity.

Table 2: Input data for performing tasks of the Create Inquiry activity.

Nr	Data item	Value	Description
Task 1			
1	Inquiry type	IN	A classification that distinguishes between different types of sales document.
2	Sales organization	US East	An organizational unit responsible for the sale of certain products or services.
3	Distribution channel	WH	
4	Division	Bicycles	
Tasks 2, 3, 4			
5	Customer	<customer>	Customer from the initial data of the assignment
6	PO number	<any string>	Number that the customer uses to uniquely identify a purchasing document
7	PO day	<today's date>	
8	Valid from	<today's date>	The date from which the inquiry is valid.
9	Valid to	<today's date + 30 days>	The date till which the inquiry is valid.
10	Inquiry items	<product name> <quantity>	Product name and quantity from the initial data of the assignment

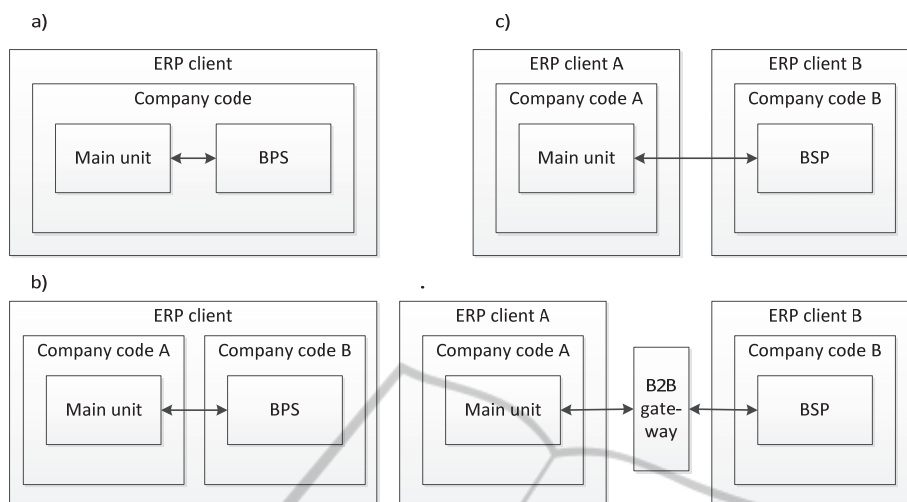


Figure 3: Integration scenarios.

These fragments refer to the Create Inquiry activity of the Sales process. Figure 2 shows individual tasks to be performed within this activity. For instance, the customer information should be provided to create an inquiry. Meaning and purpose of these tasks are explained in the instructions. However, the students are left to their own devices to choose appropriate features of the ERP system to perform the task. Table 2 provides the relevant input data values to perform the tasks.

A template for reporting the case execution results is also developed. It defines the main outcomes for every step of the business process to be reported.

### 4.2 ERP Setup

The ERP setup should enable execution of the international sales process by providing integration between teams studying at different universities. Four integration scenarios are identified in Figure 3. The simplest scenario (a) assumes that both universities use the same ERP client and both the main unit and BSP use the same company code. This scenario implies that the identical configuration is used and there is no need establishing an information integration link. The single client two company codes scenario (b) implies that both companies might have different configuration allowing to represent specific localization requirements while application integration is not necessary. The remaining two scenarios (c) and (d) include application integration and most closely resemble real-life execution of cross-enterprise business processes.

Currently, the simplest scenario of integration is used implying that both universities use the same ERP client and work within a single company code though with limited permissions to execute certain tasks as described in the next section.

### 4.3 Role Setup

Every university involved in the case represents one of the companies (i.e., GBI or GBI BPO). Every company is responsible for a certain list of activities, and these activities are performed by certain role in the company (Table 3).

To delimitate the roles, two composite SAP ERP roles are create. The composite SAP ERP role SAP\_GBI\_SD\_MAIN is assigned to GBI and the composite SAP ERP role SAP\_GBI\_SD\_BPO is assigned to GBI BPO. Thus, every company can perform only activities assigned to their composite

Table 3. Assignment of the roles between GBI and GBI BPO.

Company	Role	Activity
GBI	Plant rep.	Create new customer
		Create quotation
		Create sales order
	Billing Clerk	Create invoice
	Accountant	Post incoming payment
GBI BPO	Sales person	Create inquiry
	Warehouse Emp.	Create outbound delivery Change outbound delivery Procurement

role (e.g., Create inquiry is available only to GBI BPO). There is no separation of roles within the company (e.g., Plat representative and Billing clerk use the same composite role SAP\_GBI\_SD\_MAIN).

**4.4 Collaborative Learning Process**

The international ERP collaborative learning takes place in three stages: 1) kick-off; 2) process execution; and 3) evaluation. During the kick-off phase, an introductory lecture on international ERP is given, teams of students are formed and individual assignment is given to the teams. The introductory lecture gives an overview of the case study and explains the collaborative learning process.

Students organize team of 3-4 students at both universities. The teams are randomly paired together and they exchange the contact information. The individual assignment is given to each pair of the teams. The individual assignments represent three different customer inquiries and it includes cases of a new customer and out-of-stock situations.

Execution of fulfillment processes is initiated by GBI BPO and subsequently every team has 2 working days for completing its activities. During the evaluation phase, the teams finalize the process execution report and fill out a questionnaire providing their feedback on the assignment.

**5 OBSERVATIONS**

The international ERP assignment was used in the study process in Fall of 2014. 46 students organized in 7 teams and every university participated in the exercise. All 7 pairs of the team were able to complete the process using data from at least two initial customer inquiries though 3 teams were not able to complete the process using data from one initial customer inquiry because of incorrectly setup master data or lack of coordination in inventory replenishment.

The learning experience is evaluated by summarizing responses from the questionnaire (Table 4). The students mostly agree with statements from the questionnaire. Several questions indicate that the international ERP exercise was more engaging led to better understanding of the SAP ERP systems and the sales process. However, a significant number of students indicate that having specific roles did not improve their understanding of the sales process execution in the ERP system. The students stated that actions of the other team were not sufficiently transparent. This issue could be resolved by having the team to switch their roles. There is also a significant spread of options concerning the improvement of problem-solving skills. On several occasions troubleshooting was done remotely by the instructors. It is suggested that it should be done jointly by the instructors and the students' team working together. Not all team

Table 4: The surveying results as a percentage of all answers.

Question	Strongly Agree	Agree	Disagree	Strongly Disagree
International ERP was a more interesting way of studying than traditional exercises	36	42	19	3
Completing International ERP exercises was more complex than completing the standard GBI exercises	46	43	11	0
Completing International ERP exercises required more in-depth understanding of SAP ERP than completing the standard GBI exercises	43	46	9	3
Completing International ERP exercises improved my understanding of SAP ERP system	39	39	11	11
Having specific roles in the process execution improves understanding of the way enterprise applications work.	36	33	19	11
Communication with your other teams was positive	28	47	19	6
International ERP improved my collaboration and problem-solving skills.	17	47	25	11
International ERP consumed more time than I expected.	78	14	8	
We needed to communicate with the other team too often	31	42	19	8
We needed to seek outside assistance (e.g., from instructor) too often.	28	44	17	11



interacted smoothly and this issue could be resolved by organizing an initial virtual get-together for the team members from all universities so that they can discuss their background and studying approach.

A number of potential improvements in the instructions and organization of the collaborative learning process were also identified to reduce the need for frequent outside assistance from the instructors.

The learning objectives stated in Section 3 were achieved. The knowledge of the sales process was improved by resolving different exceptional situations not considered in the standard GBI case. The teams were able to track the process execution and to exchange the necessary process execution data as well as to submit the final report. The students had very intense exchanges and jointly worked on problem solving. They experienced significant peer pressure to complete their activities on time and they approached that very dutifully. The cases of peer learning were observed both within the team and among team in both universities. The students also experience restrictions imposed by having different roles in the SAP ERP system.

In general, the mix between deductive and inductive teaching methods proved suitable for our teaching module and the international ERP case study. A small part of the lectures was a repetition of content in information systems, ERP systems and process-oriented organizations that already was part of earlier courses. Most of the lectures were dedicated to prepare case study work.

It is difficult to assess what individual progress and competence development the different students made. Here, we only can rely on the results of the assignments and exams. We also performed the international case study in autumn 2013. In 2013, the participation in the case study was not mandatory for in Rostock from MSc service management, i.e. they were allowed to participate in the e-Business module without the case study. When comparing the exam results between those students participating in the case study and those not participating, the results for the participating ones were much better in the ERP part. This is not surprising; nevertheless it indicates a certain value of the case study for learning success.

## 6 CONCLUSIONS

The international ERP provides a realistic representation of business process execution using ERP systems in the international environment and

the students recognized the value of having this kind of exercise. At the same time several areas of improvement have been identified. The objective of promoting collaborative problem-solving was only partially achieved and additional effort should be devoted to establishing initial cohesion between team at different universities. The joint troubleshooting with the instructors is also important. The students need to have an initial exposure to the SAP ERP system and going through the standard GBI curriculum first is essential for successful completion of the international ERP.

From the technical perspective, other ERP integration scenarios should be considered as they provide a more realistic representation of the way ERP systems are used by different companies. Exposing differences of ERP configurations used in different countries is also an important aspect for further elaboration.

Using a common e-learning platform is also considered for future activities because current e-learning systems used at both universities are not compatible and even though the same information was distributed to the students it was presented differently and there were some information availability gaps. This is the general limitation of many e-learning platforms that they are not geared towards cross-university collaboration.

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## REFERENCES

- Boyle, T. A., & Strong, S. E., 2006. Skill requirements of ERP graduates. *Journal of Information Systems Education*, 17(4), 403-412.
- CEN, 2014. European e-Competence Framework 3.0: A common European Framework for ICT Professionals in all industry sectors. CWA 16234:2014 Part 1.
- Chang, H.H., Chou, H. W., Yin, C. P., Lin, C. I., 2011. ERP post-implementation learning, ERP usage and individual performance impact. *PACIS 2011 Proceedings*. 35.
- Cronan, T.P., Douglas, D.E, Schmidt, P., Alnuaimi., O., 2009. ERP Simulation Game; Learning and Attitudes

- toward SAP Samples of Company „First Time Hires. Technical Report, University of Arkansas.
- Cronan, T. P., Leger, P. M., Robert, J., G. Babin, and P. Charland, 2012. Comparing Objective Measures and Perceptions of Cognitive Learning in an ERP Simulation Game: A Research Note. *Simulation & Gaming*, 43, 4, 461–480.
- Dillenbourg, P., 1999. What do you mean by collaborative learning? *Collaborative-learning: Cognitive and Computational Approaches*, 1-19.
- Hayes, G., McGilsky, D.E., 2007. Integrating an ERP System into a BSBA Curriculum at Central Michigan University. *International Journal of Quality and Productivity Management*, 7, 1, 12-17.
- Hepner, M., Dickson, W., 2013. The value of ERP curriculum integration: Perspectives from the research. *Journal of Information Systems Education*, 24, 4, 309-326.
- Hussey, M., Wu, B., Xu, X., 2011. Open and Closed Practicals for Enterprise Resource Planning (ERP) Learning. In *Software Industry-Oriented Education Practices and Curriculum Development: Experiences and Lessons*, 138-152.
- Laal, M., Ghodsi, S., 2012. Benefits of collaborative learning. *Procedia - Social and Behavioral Sciences*, 31, 486-490.
- Leger, P. M., 2006. Using a simulation game approach to teach ERP concepts. *Journal of Information Systems Education*, 17, 4, 441-447.
- Magal, S.R., Word, J., 2012. *Integrated Business Processes with ERP Systems*. Wiley, New York.
- Markus, M.L., Tanis, C. & Van Fenema, P.C. 2000, Multisite ERP implementations. *Communications of the ACM*, 43, 4, 42-46.
- S. Mohamed, T. S. McLaren, Probing the Gaps between ERP Education and ERP Implementation Success Factors, *AIS Transactions on Enterprise Systems 1* (2009) 1, 8-14.
- E. Monk and M. Lycett, “Using a Computer Business Simulation to Measure Effectiveness of Enterprise Resource Planning Education on Business Process Comprehension,” 2011.
- Moon, Y.B., Chaparro, T.S., Heras, A.D. 2007, "Teaching professional skills to engineering students with Enterprise Resource Planning (ERP): An international project", *International Journal of Engineering Education*, vol. 23, no. 4, pp. 759-771.
- Pawlowski J.M., Holtkamp, P., 2012. Towards an internationalization of the information systems curriculum. *MKWI 2012 - Multiconference Business Information Systems*, 437-449.
- Prince, M. J., Felder, R. M. , 2006. Inductive Teaching and Learning Methods: Definitions, Comparisons, and Research Bases. *Journal of Engineering Education*, 95, 123–138.
- Prince, M., Felder, R., 2007. The many faces of inductive teaching and learning. *Journal of College Science Teaching*, 36, 5, 14.
- O'Sullivan, J., 2011."Does using real world tools in academia make students better prepared to enter the workforce as compared to a toy type simulation product? A look at ERP in academia, does using this real world tool make a difference to industry?, *IMSCI 2011 - 5th International Multi-Conference on Society, Cybernetics and Informatics*, Proceedings, 102.
- Shehab, E.M., M.W. Sharp, L. Supramaniam and T.A. Spedding, 2004. Enterprise resource planning An integrative review. *Business Process Management Journal* 10, 4, 359-386.
- Theling, T., Loos, P., 2005. Teaching ERP Systems by a multiperspective approach. *Association for Information Systems - 11th Americas Conference on Information Systems, AMCIS 2005: A Conference on a Human Scale 3*, 1043-1054.
- Topping, K. J., 2005. Trends in peer learning. *Educational Psychology*, 25, 6, 631-645.