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Message from the International President

Dear SIEC-ISBE Friends,

Welcome to the 155th edition of The *International Journal for Business Education*, formerly known as *The Review*. Our journal is a blind, peer-reviewed publication for global business educators by global business educators. The journal is published once per year. ISBE members provide in-depth research articles that can be helpful in the classroom or with administrative responsibilities. Each article, based upon research conducted by our members, adds to the body of knowledge in global business education. As in the past, a brochure for the upcoming conference will be included. Additionally, a call for nominations for the office of Professional Development Chair and International President is included as required by our constitution.

I want to thank Tamra Davis, Ph.D. of the USA Chapter and Michaela Stock, Ph.D. of the Austrian Chapter for taking on the task of editors. I also want to take a moment to thank our reviewers. The complete list of reviewers can be seen on our Editoral Board page. Your expertise was beneficial in helping improve the quality of the accepted manuscripts and offering guidance for improvement to those authors whose work was not accepted this year. I would also like to thank Sam Peters, a business and English eduation major for proofreading and editing the final manuscripts.

Our international conference will be located in Krakow, Poland. The conference theme, Education for Business Sustainability, is an exciting theme that is very appropriate as our organization celebrates 114 years of excellence in Business Education. I hope to see you at the 2015 conference and our future conferences as well. Future conferences are planned in the following locations:

2016—Austria

We are seeking proposals for conferences in 2017 and beyond.

With warmest SIEC-ISBE regards until we meet again,

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Preface

I would like to thank the wonderful professionals who filled the role of reviewers for this year's journal. Due to the number of manuscripts received, multiple reviewers were needed. Without their assistance, the job of editor would have been much more difficult. Thank you to the entire Editorial Board who are SIEC-ISBE members and volunteered to help when asked. Thank you. I would also like to thank my student, Sam Peters, for providing proofreading and editing expertise. Your help was invaluable.

We hope that you find the articles included in this year's The *International Journal for Business Education* interesting. Thank you to everyone who submitted a manuscript for consideration. Without your submissions, we would not have had a journal.

Tamra S. Davis, Ph.D.
SIEC-ISBE Editor 2015

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Competence-Oriented Instruction in Vocational Education in Austria:
An Empirical Comparison between Two Instructional Approaches

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Abstract

A distinct feature of the Austrian education system is its differentiation of programs in vocational education. Among these programs, the dual education system has a long tradition: Students undergo an apprenticeship in a company while also attending a vocational school in part-time. More than other forms of education, this combination of on-the-job training at the work place and instruction in vocational school requires constant adaptation to economic requirements.
Against this background, a new instructional approach, so called areas of learning with a focus on competence were introduced in the vocational school Eisenstadt in the year 2010. The introduction of this approach offered an opportunity for comparing it with a "traditional" subject-oriented approach. Results of the comparison will be presented and discussed in this article.

Evaluation of different instructional approaches

In the year 2010, a new instructional approach was introduced in the vocational school of Eisenstadt (Austria). Vocational education for apprentices was restructured according to the approach of areas of learning with a focus on competence-oriented instruction. In this approach, learning contents are structured such that they reflect work processes and not traditional subjects.
This approach was evaluated by a comparison of instruction in three schools: The vocational school in Eisenstadt which had introduced the former approach and two other vocational schools in Styria which still employ a subject-oriented approach.

Formally, the evaluation followed the CIPP model (Stufflebeam, 2002) which considers *c*ontexts, *i*nputs, *p*rocesses and *p*roducts. A special focus lay on the comparison of the two instructional approaches. Following the perspective of instruction as an interaction in which different stakeholders are involved, students, teachers, principals, and students' trainers at the work place were asked to take part in the evaluation. Data collection was based on a multi-method approach, applying different research methods such as interviews, surveys, and performance assessment in order to achieve a higher validity of findings.

The following questions will be addressed in this paper:

1. How do teachers in the two instructional approaches experience the organisation of their work?
2. How do teachers with and without experiences in the two approaches assess them?
3. Do students' achievements differ in the two approaches?

Competence-oriented instruction and instruction according to areas of learning

SCHEWIOR-POPP describes areas of learning as "areas of application designed for educational purposes, based on didactic considerations" (2005, p. 7). The areas of learning concept involve the transformation of traditional school subjects and disciplines into a cross-curricular approach as it organizes learning contents into comprehensive tasks and problems as they are carried out in the workplace or in daily life situations (Ertl & Sloane, 2004). This transformation is the main difference from the subject based approach. The traditional subjects are no longer the starting point for teaching. Examples of areas of learning in the first year of commercial education would be "presentation of goods" or "conversations with customers". This means that, first, areas of learning represent a curricular and not an instructional approach. In this approach, learning objectives describe competencies that students are required to develop.

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Figure 1: The relationship between areas of application, areas of learning, and learning situations
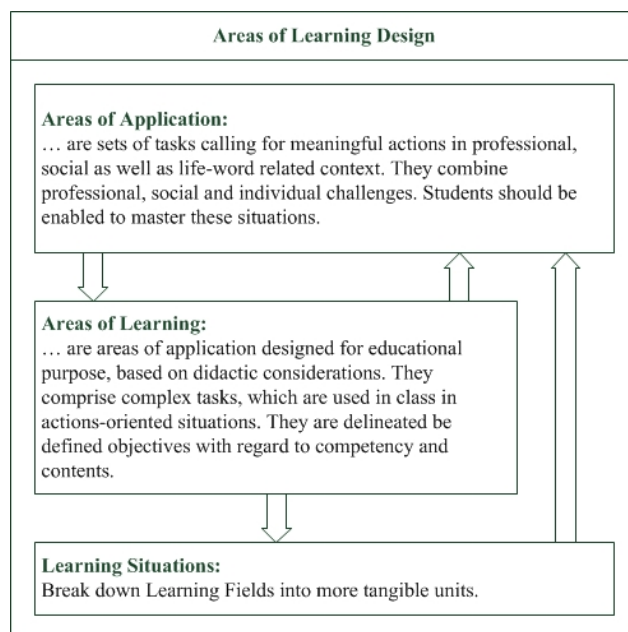
Figure 1. Areas of Learning Design. Graphic from Schewior-Popp (2005, p. 7).

The organization of the curricula in accordance with areas of learning demands activity-oriented learning and teaching arrangements. It assumes that all pupils come to school with resources for understanding, finding, and trying out solutions. In these kinds of learning and teaching arrangements, the role of the teacher changes to a team-worker and to a facilitator of learning who encourages self-regulated learning processes. In the context of vocational education, competences and areas of learning are regarded as parts of a concept aimed at the "promotion of the learner's personal development with a view to the social responsibilities associated with education on the one hand, and employability on the other." (Schewior-Popp, 2005, p, 8). Areas of learning replace instruction in which contents are structured by a traditional view of subjects.

Vocational education within a dual education system (i.e., pupils undergo an apprenticeship in a company and attend school) has a long tradition in the German speaking countries (Austria, Germany, Switzerland). The past few years have seen vocational schools having to undergo significant reforms of their school organization and the German speaking countries have chosen different paths. In Germany, reforms involved the implementation of the "areas of learning" approach as a top-down process from the federal education ministries to schools. Curricula had to be changed and organized into "areas of learning" (KMK, 2004; Rebmann, Schloemer, Berding, Luttenberger & Paechter, in press). Yet, a scientific investigation of that approach had been neglected.

In Austria, different vocational schools introduced the "areas of learning" approach on their own. This offered an excellent occasion for empirical investigations of the approach because schools which apply the "areas of learning" approach could be compared to schools which apply a subject-oriented approach. The present study, therefore, has also a strong international impact because it takes up research questions which concerns basically all countries with a vocational dual education system.

Based on the principle of action competence and current curricula, the vocational school Eisenstadt developed a systematic description of areas of learning, topics, competences to be acquired, and, partially, specific learning assignments for its various training courses (cf. Fenz, 2012). The areas of learning describe superordinate topics (e.g., basics of retail). A special characteristic of the school's instructional concept is the consequent combination of areas of learning with a competence-oriented approach of teaching. At the time of the survey, the vocational school Eisenstadt offered training courses which rely completely on areas of learning as well as subject-oriented instruction and courses which employ a combination of both approaches.

Evaluation design

Three schools took part in the evaluation: The vocational school in Eisenstadt which, a few years ago employed a subject-oriented approach, and two other schools which still employ a subject-oriented approach.

In the evaluation, different stakeholders were questioned. The present article focuses on teachers' assessments, students' assessments, and students' achievements. Altogether, 62 teachers (among them 29 from Eisenstadt) filled in a questionnaire on the two instructional approaches. Approximately 1,000 students filled in two questionnaires on their school experiences at two points in time. A subset of 550 students, namely those in vocational training for retailers and clerks, took part in tests on their vocational knowledge. Furthermore, 952 students took part in tests on their social skills needed at the work-place. The tests had been designed as mini-case studies in which students have to solve a work-related problem.

Research Method

The questionnaire for the teachers was design based on different, already validated items. In this article, only some results can be presented based on the items shown in Table 1.

Table 1
Part of the teacher questionnaire

Topic	Items
Climate in class and school	• Perception of social bonding (Prenzel et al., 1996), QIBB (Paechter & Mayringer, 2006)
Cooperation	• Teacher cooperation (development of teaching), Cooperation in the special field (Asseburg et al., 2009) • Positive social climate (staff) (Ditton & Merz, 2000) • Satisfaction with the colleagues (BM:BWK, 2004)
Areas of Learning/ Competence orientation	• General questions about the areas of earning (Tramm et al., 2009); Professional stress (Ditton & Merz, 2000) • Self-development

Students' vocational knowledge was assessed by different performance tests. Assessments could only be carried out for students in training courses for retailers and clerks (the largest subsample of

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students). Separate assessments were developed for each school year of the three-year long courses. The assessment for the first year included tasks on the comparison of offers, invoice components, and payment transactions; the assessment for the second year dealt with tasks on debt collection and insufficient fulfillment of purchase contracts; the assessment for the third year included tasks on purchase contracts, calculation, marketing, and customer complaints. Altogether, eight tests were developed (three for school year 1 and 3, two for school year 2). All assessments covered essential learning contents of the training programs which had to be taught in all three schools participating in the study. The tests were graded so that students could achieve a maximum of six points.

Students were allowed to use all materials available to them (e.g. textbooks, calculators). Tests were to be completed within 60 minutes.

The test for the vocational knowledge had been developed by two experts in the field with a degree in business education. In order to test face validity, the tasks were assessed by another expert to determine whether the tasks represent the learning contents of the curriculum, whether they are appropriate for the respective age group and educational level, and whether they are suitable to an areas of learning approach. A similar approach of assessing face validity had been employed for the evaluation of case studies for the assessment of social competences.

Students' social skills were also assessed by mini-case studies. Here, standardized tests were used (Paechter, Kreisler, Luttenberger, Macher & Zug, 2014). In the tasks, conflict scenarios had to be solved by students. Students then had to answer the following questions:

- "A team colleague who mostly is reluctant to support you expects your support in a work task that is relevant for her/him. What kind of behaviour would you consider appropriate in dealing with this colleague?"
- "A colleague offends you. She/he claims that you are not capable of doing your job without the help of others. You know from your own work experience that this accusation is not appropriate. What kind of behaviour would you consider appropriate in dealing with this colleague?"

Results

Research question 1: How do teachers in the two instructional approaches experience the organisation of their work?

Teachers in both instructional approaches assessed relevant work processes mainly involving team work (compare Figure 2).

Differences can be found, for instance, with regard to the perception of the social climate at the school (areas of learning M = 5,14 [M = Mean]; subject-oriented approach M = 4,12). Teachers in the areas-of-learning approach (M = 2,21) also indicate higher satisfaction with opportunities to talk about their subject with colleagues than teachers in the subject-oriented approach (M = 2,76).

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However, when interpreting the results one should keep in mind that a better social climate might be an outcome of the areas-of-learning approach as well as a requirement for the introduction of the approach.

Figure 2: Assessment of teamwork among teachers
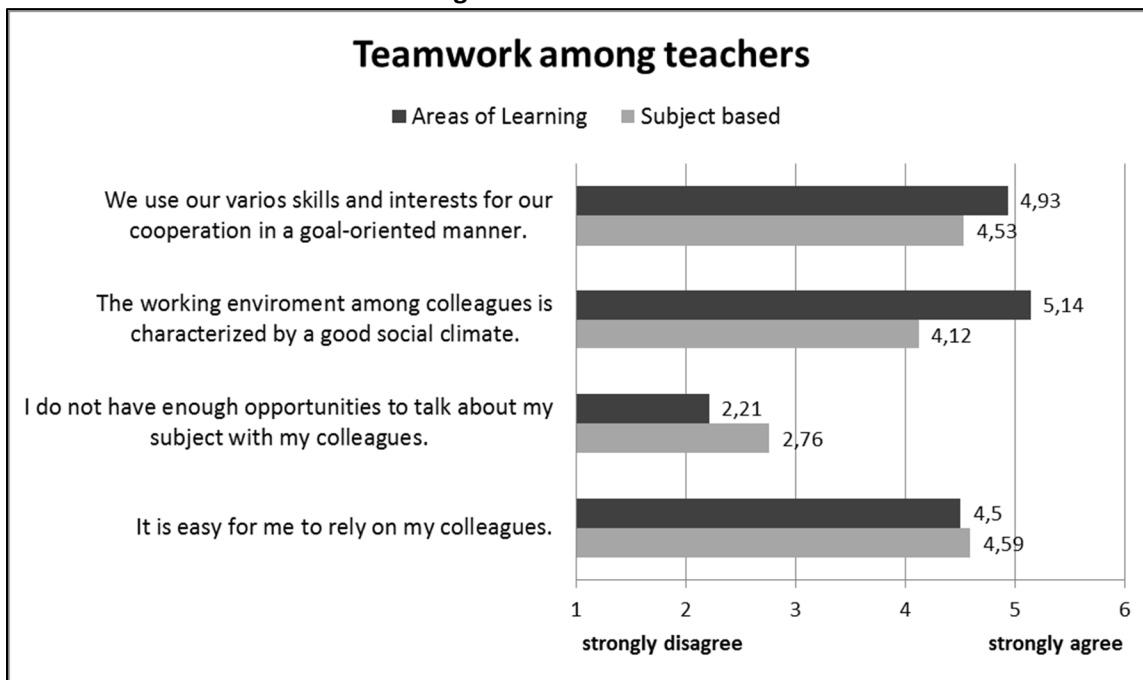
Figure 2. Teamwork among teachers

Research question 2: How do teachers with and without experiences in the two approaches assess these approaches?

All teachers participating in the study were asked to assess various aspects of team work among teachers in an areas-of-learning and in a subject-oriented instructional approach. This means, that teachers from the vocational school in Eisenstadt assessed their actual experiences in the areas-of-learning approach (AREAS of LEARNING about AREAS of LEARNING) and their previous experiences in a subject-oriented approach (AREAS of LEARNING about Subject based) as all of them had encountered the latter approach in their profession. Teachers from the two other schools assessed their actual experiences when evaluating teamwork in the subject-oriented approach (Subject based about Subject based) and their assumptions on teaching in an areas-of-learning approach (Subject based about AREAS of LEARNING) as they had no experiences with the latter approach.
All items were formulated such that the teachers were assessed on a rating scale ranging from 1 (very rarely) to 6 (very often) regarding how often certain forms of cooperation among teachers can be applied in an instructional approach.

Figure 3: Assessment of team work in the two approaches
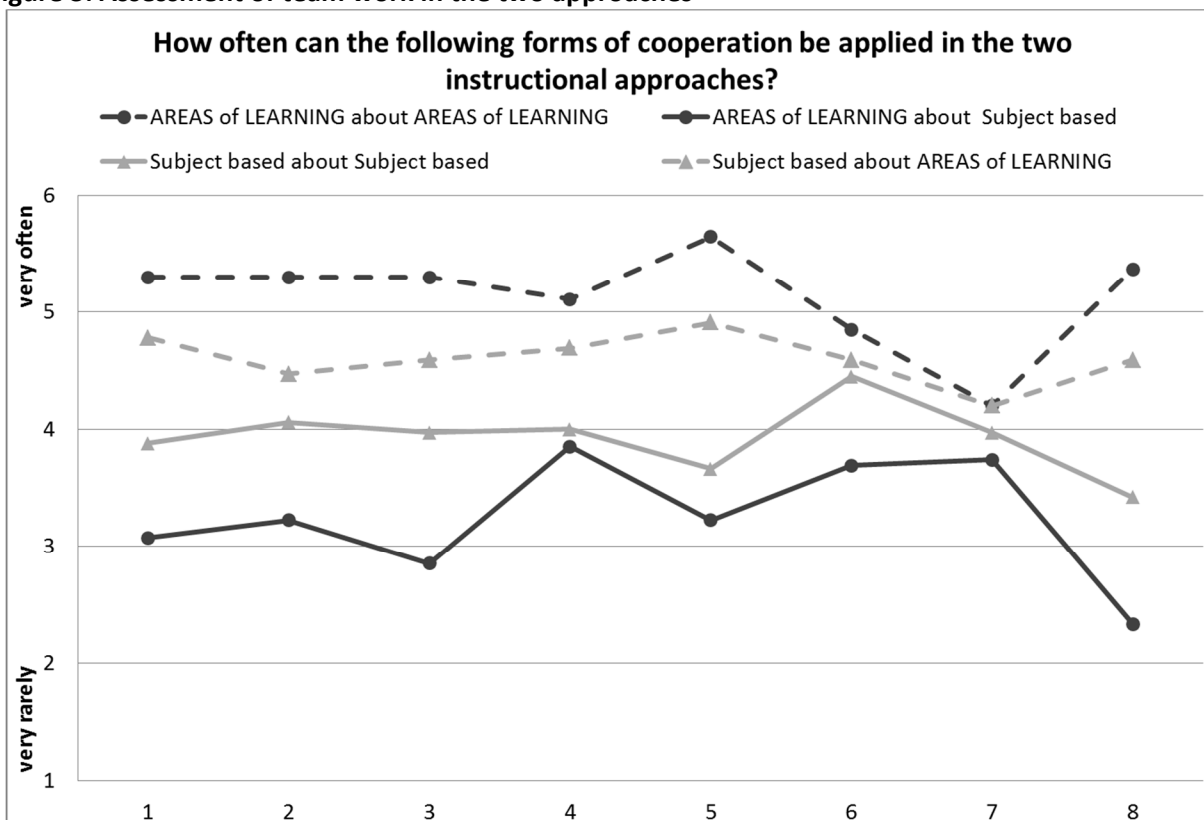
Figure 3. Forms of cooperation

(1) Mutual agreement about the learning objectives
(2) Development of instructional material and exams
(3) Instruction planning
(4) Teaching and projects
(5) Cross-curricular teaching and learning
(6) Discussing student performance among teachers
(7) Further education and training for the teachers
(8) Team teaching

The results show that both groups of teachers associate an areas-of-learning approach with a higher degree of teamwork among teachers. The contrast between the assessments of both instructional approaches is highest for teachers who use an areas-of-learning approach (and who have experiences with both approaches). They strongly emphasize the possibilities for teamwork in this instructional approach.

In a similar fashion, teachers were asked to which degree both instructional approaches are able to foster favourable learning achievements (ranging from action competence to social/personal competences). Again, all teachers were asked to assess both instructional approaches.

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Figure 4: Fostering different learning and behavioural achievements in the two approaches
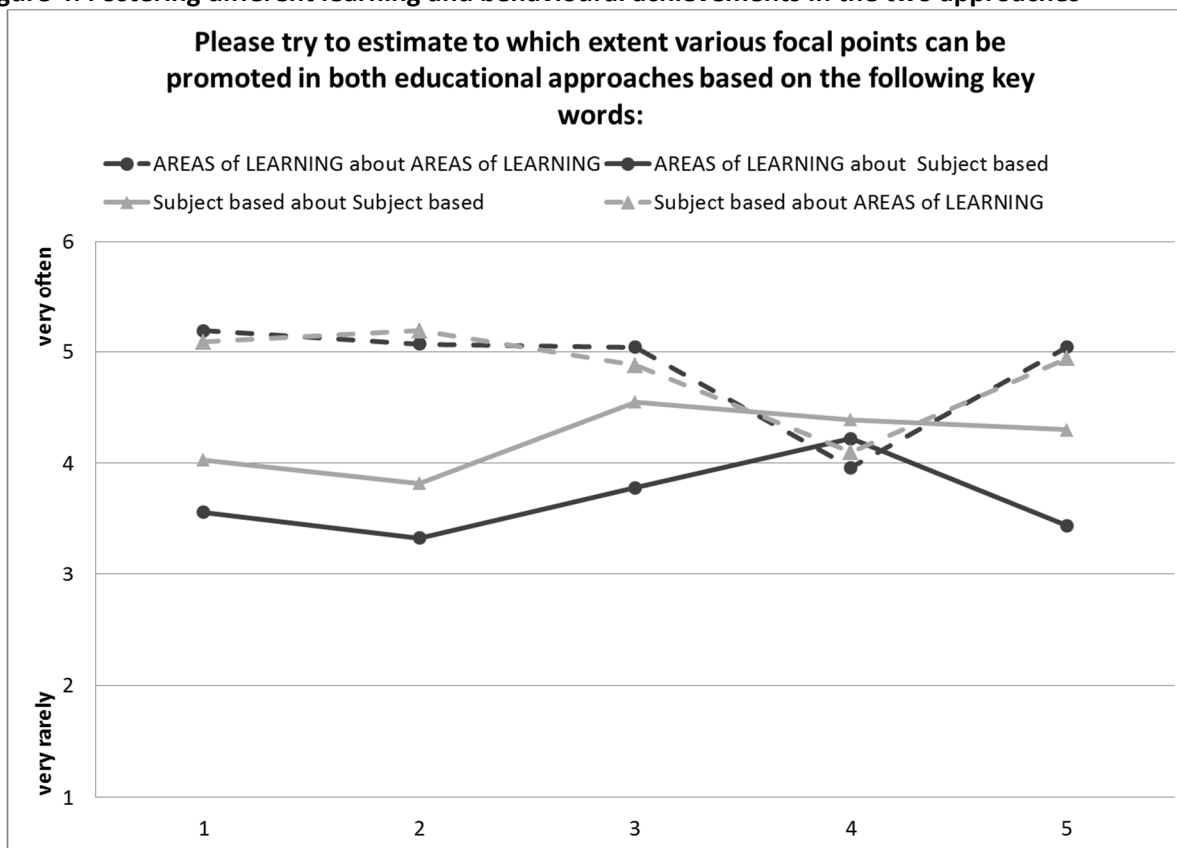
Figure 4. Comparing the different learning and behavioural achievements in the two approaches.

(1) Foster students' professional action competence
(2) Foster interrelated knowledge of contents
(3) Train professional problem-solving
(4) Foster disciplined behavior
(5) Foster social und personal competences

The results show that both groups of teachers associate an areas-of-learning approach with higher student achievements regarding professional action competence, interrelated knowledge of contents, problem-solving, as well as social and personal competences. They see no differences between the two approaches when it comes to encouraging disciplined behaviour. These results show, on the one side, the actual experiences of those teachers who already apply a competence-based areas-of-learning approach and, on the other side, the expectations of teachers who still apply a subject-oriented approach.

Finally, teachers assessed to which degree an areas-of-learning approach implies positive or negative consequences for students, teachers, and the school as such. Figure 5 shows the assessments of the two groups of teachers. Altogether, all teachers regard an areas-of-learning approach as a suitable means to achieve a higher quality of instruction and of school quality. They, however, emphasize that this

approach poses higher demands on students. Negative implications such as lower transparency of learning objectives for students may occur but are not considered as alarming.

Figure 5: Implications of an areas-of-learning approach

A competence-oriented areas-of-learning approach leads to ...

- Areas of Learning
- Subject based

	Areas of Learning	Subject based
... improved quality of instruction/lesson.	4,89	4,42
... higher demands placed upon students.	4,7	4,67
... important progress for schools and education.	5,04	4,3
... intransparency of learning objectives for students.	3,19	3,24
... intransparency of the curriculumf or teachers.	3,22	3,27
... a division between advocates and opponents of the concept among teachers.	3,63	3,33

1 strongly disagree — 6 strongly agree

Figure 5. Implications for teaching

Research question 3: Do students' achievements differ in the two approaches?

Figure 6 shows the comparison of the average scores achieved in the two instructional approaches. Overall, two tests showed differences between the approaches: a mini-case study concerned with debt collection (assessment 2.1.) and a mini case study concerned with supplier relations (assessment 3.1.). The debt collection task was the task with the highest degree of complexity in all assessments. Students had to consider interdependencies and come up with decisions that needed consideration of all interdependencies.

The case study on supplier relations was insofar challenging as the description of the case was accompanied by a large amount of information irrelevant to the task solution. Students had to distinguish between information necessary and information unnecessary for the task solution. The final completion of the task itself was comparatively less demanding (writing a business letter).
In both assessments, students in the competence-oriented areas-of-learning approach showed higher achievements than students in the subject-oriented approach.

Figure 6: Comparison of students' achievements in professional knowledge in the two approaches

Achievement in tests on professional knowledge

■ Areas of Learning   ■ Subject based

Assessment	Areas of Learning	Subject based
Assessment 3.3	1,44	1,73
Assessment 3.2	2,52	2,43
Assessment 3.1	3,4	2,07
Assessment 2.2	0,25	0,33
Assessment 2.1	4,48	3,27
Assessment 1.3	1,19	0,91
Assessment 1.2	3,25	2,89
Assessment 1.1	5,24	5,05
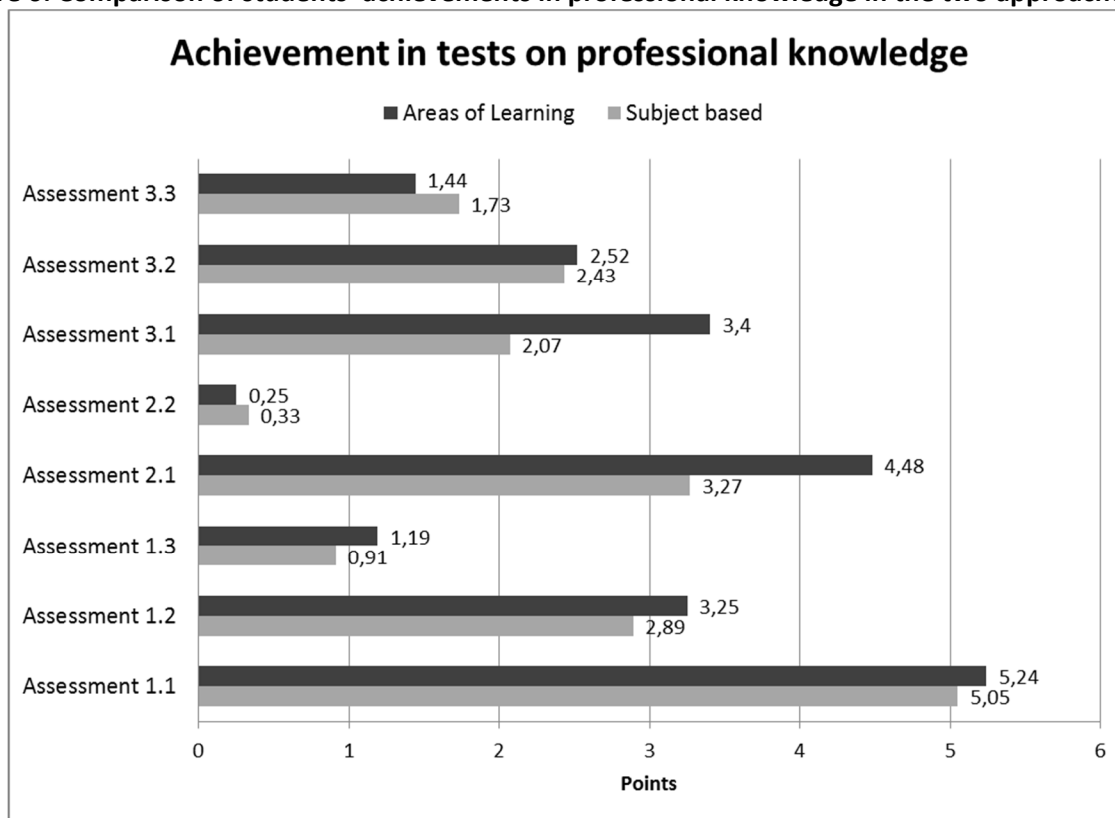
Points

Figure 6. Differences in achievement

The last result presented in this paper is the results of the test for the students´ social skills, assessed by mini-case studies. The total amount of points to be achieved was six. Subject oriented students achieved a better average (Mean value M=4,47) than learning field oriented students (M=3,76).

First implications of the study
When asked about actual work experiences, teachers in the vocational school Eisenstadt report a distinct culture of team work and various opportunities for team work in their school. Team work seems to occur more often in an areas-of-learning approach.

In the assessments of all teachers, an areas-of-learning approach is strongly connected with working together, ranging from joint decisions of learning objectives to team teaching, than a subject-oriented approach. Teachers in the areas-of-learning approach see various opportunities for implementing different forms of cooperation. Teachers in the subject-oriented approach largely agree with this view. Moreover, there is a remarkably high level of agreement among both groups of teachers regarding the high potential of an areas-of-learning approach in terms of competence-oriented instruction.

Altogether, all teachers evaluate areas of learning positively. Both groups of teachers see advantages in the areas-of-learning approach and regard it as a general improvement over the subject-oriented approach. They, however, also emphasize the higher demands on students.

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The tests on professional knowledge indicate better student achievements in the areas-of-learning approach when it comes to complex tasks as they are also carried out in the work place. However, this instructional approach does not necessarily imply higher achievements in social skills. The slightly worse achievements in social-skills tasks emphasizes that social skills cannot be acquired as a by-product of a modern instructional approach but require reflection and practice on the students' side.

Based on this study, a number of questions arise for further research. Team work seems to be a crucial part for the teachers in an areas-of-learning approach. How to improve team work (benefits, motivation, etc.) within the college is an important question. The tests on professional knowledge give some hints, that the areas-of-learning approach can strengthen the competence of the students. It remains to be seen whether the students are able to show these competences in their working life.

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Analysis of Learning Assignments Applying ERP-Systems in Textbooks for Commercial Colleges in Austria

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Abstract

Enterprise-Resource-Planning-Systems (ERP-Systems) – such as SAP, BaaN, Infor LN, MS Dynamics, WinLine and BMD – are becoming increasingly important for private and public enterprises and NGOs around the globe. The use of ERP-Systems leads to changing (vocational) working routines. ERP-Systems are therefore an important subject for vocational education and – from a scientific viewpoint – a research topic of high interest. However, only a very limited number of journal articles are available that address the use of ERP-systems in the context of business education. This article contributes to this field of research with an analysis of learning assignments applying ERP-Systems. First, the theoretical background for the analysis of learning assignments applying standard commercial software (ERP-systems) is outlined. Second, the results of a qualitative content analysis study on 1,921 learning assignments in textbooks for commercial colleges in Austria are presented and discussed. The paper is concluded by recommendations for action and the most important implications for future work and future research and development in this field.

Introduction

Enterprise-Resource-Planning-Systems (ERP-Systems) – such as SAP, BaaN, Infor LN, MS Dynamics, WinLine and BMD – are a type of business management software that supports the execution of business processes in areas like procurement, production, planning, sales, finance and controlling, asset management, and human resource management in an integrated manner (Gronau, 2013; Hesseler & Görtz, 2010, p. 7; Hansen & Neumann, 2005, p. 529). ERP-Systems are a very important tool for the vast majority of business administration activities. They are becoming increasingly important for private and public enterprises and NGOs around the globe in order to run their businesses efficiently and to stay competitive (e.g. Wailgum, 2008). Today 80% of German enterprises with a headcount of more than 50 make use of ERP-Systems (ERP-Studie, 2011). 75% of big, 45% of mid-size, and 15% of small enterprises in Austria are currently using ERP-Systems to run their businesses (Statistik Austria, 2011). The use of ERP-Systems leads to changing (vocational) working routines (Pongratz, Tramm & Wilbers, 2010, p. 5; Scholz, 2007, p. 50). As an example, the execution of many business processes has been automated to a big extent. Hence, workers are no longer only business case handlers. They also need to be able to handle upcoming failures as well (Siemon, 2007, p. 14). These changes in working life imply changes in qualification requirements of current and future staff (Tramm, 2010, p. 77 and 99). ERP-Systems are therefore an important subject for vocational education and a research topic of high interest. However, only a very limited number of journal articles are available that address the use of ERP-systems in the context of business education (Moon, 2007, p. 246; Addo-Tenkorang & Helo, 2011, p. 1132). This article contributes to this field of research with an analysis of learning assignments applying ERP-Systems.

Learning assignments in general do have strong influence on planning and execution of classroom lessons (e.g. Engelhardt, 2008; Gerdsmeier, 2004). They are essential to competence-oriented teaching (e.g. bm:ukk, 2012, p. 12; Schmit et al., 2010; Klieme, 2004, p. 628). However, the analysis of learning assignments is one of the most ignored research fields (Blömeke, 2009, p. 17; Gerdsmeier, 2004). Learning assignments applying ERP-Systems have not been analyzed systematically so far. The purpose of this article is to contribute to filling this research gap.

Research questions and research outline

Based on the above considerations the focal point of this article is set to the following research questions:

1. What are the didactical requirements for learning assignments applying ERP-Systems according to the status of research?

2. To which extent do learning assignments in textbooks for commercial colleges meet current didactical requirements?

Research related to question one is addressed through a hermeneutic approach. A review of literature is done both on vocational education applying ERP-Systems and on past analyses of learning assignments. The outcome of this research step is a deductively derived category system (Mayring, 2010, p. 66) for the analysis of learning assignments that addresses didactical requirements for vocational education in the field of ERP-Systems. Research question two is addressed through a qualitative content analysis study. The deductively derived category system is used as a research instrument for assessing to which extent learning assignments meet current didactical requirements.

Theoretical investigations

This chapter outlines the definition of didactical requirements and the composition of a category system through theoretical investigations. A review of literature shows that on the one hand ERP-Systems are becoming more and more important for vocational education but on the other hand that the current use of ERP-Systems in business education is not satisfactory. The problems and difficulties can be summarized as follows:

- Education applying ERP-Systems is mainly arranged as a pure click-training (Wilbers, 2010, p. 67 and 72; Eberle, 2010, p. 107)
- Phases of reflection and/or abstraction are offered only rarely and model oriented learning almost gets ignored (Siemon, 2007, p. 15 and 20; Tramm, 2010, p. 78, 88 and 98)
- Phases of experimental exploration are not offered (Wilbers, 2010, p. 67 and 72)
- A lack of business process orientation and a use of traditional routines instead of business processes can be observed (Wilbers, 2010, p. 72; Tramm, 2010, p. 77–100; Siemon, 2007, p. 16)
- Unconnected learning assignments without relevance to practice are frequently used (Getsch & Preiss, 2003, p. 6–8).

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Based on these problems and difficulties in the current use of ERP-Systems in business education, the following didactical requirements can be formulated:

- Learning assignments applying ERP-Systems
- should contribute to overcome problems and difficulties in the current use of ERP-Systems in business education as summarized above
- need to support the general purpose of business education: Development of vocational action competence (e.g. Pätzold, 2006, p. 72).
-

An analysis of 16 recent articles on the analysis of learning assignment shows that in particular the contributions of Maier et al. (2010), Bloemen et al. (2010), Bloemen (2011) and Kastrup & Tenfelde (2008) contain proven categories which consider all aspects of the didactical requirements outlined above. Bloemen et al. (2010) use a model of vocational action competence for their analysis of common vocational learning assignments. That model consists of six sub-competences that are mutually conditional on each other and enrich one another.

Figure 1: Vocational action competence in the ERP-domain
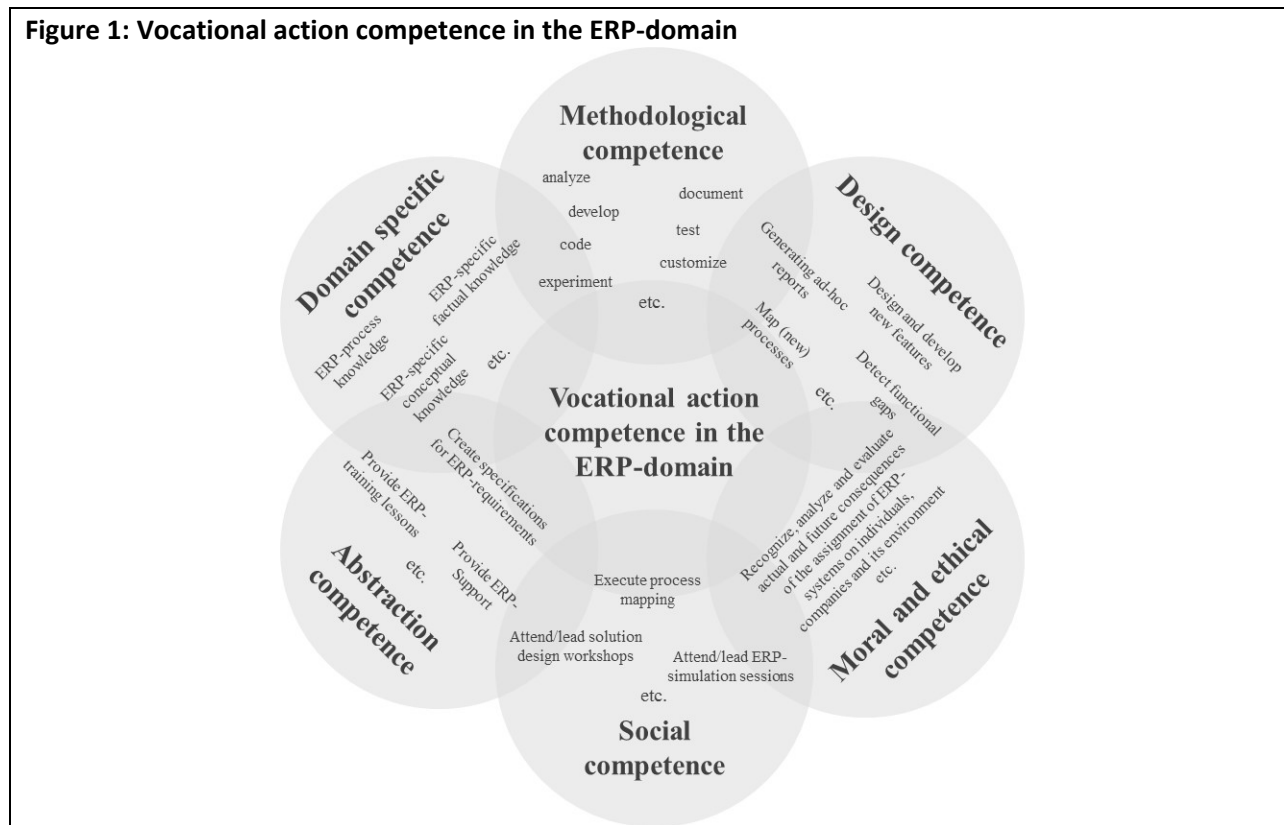
Figure 1 shows the competence model for common vocational action competence used by Bloemen et al. (2010, p. 200). In addition the model has been supplemented with typical ERP-specific competences to substantiate the outlined common sub-competences in the context of ERP-Systems. The different requirement-levels in each category are defined based on a cognitive model of holistic learning by Rebmann & Schlömer (2011). Kastrup & Tenfelde (2008) make use of the same competence model as

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well as Bloemen (2011) who, in addition, introduces the categories openness, reference to everyday life, and reference to business processes for analyzing common vocational learning assignments. From Maier et al. (2010), the category representation of knowledge has been adopted for the current analysis of learning assignments.

The selection of these categories can be justified as follows. To enable holistic learning in the sense of the constructivist paradigm, learning assignments have to be open, refer to everyday life (Bloemen, 2011, p. 66), and use a variety of knowledge representation (Maier et al., 2010, p. 39–40). The category reference to business processes has been selected in order to reflect the importance of process orientation in business administration and in vocational education (Rebmann & Schlömer, 2011, p. 6–8). Due to space constraints, the theoretical foundations of the category system cannot be outlined further here – refer to Kombacher (2013) for more details. However, the category system with its sub-categories and different requirement levels is presented in the following chapter together with the corresponding empirical results.

Empirical Results

Out of 78 approved textbooks for the Austrian Handelsakademie (Commercial College) for subjects such as business administration, business training, project and quality management, practice firm and case studies, financial accounting and controlling, business informatics, and political economy 41 textbooks have been analyzed. All of these 41 textbooks are from the two biggest publishers for vocational textbooks in Austria. In this article these publishers are named A and B for reasons of data protection. The analysis shows that 26 textbooks contain learning assignments applying ERP-Systems. In total, 1,921 learning assignments have been analyzed. More than 99% of the learning assignments are related to financial accounting and controlling, the rest (less than 1%) are related to business administration. The research results contained in the tables below are aggregated by publisher. Columns named A and B contain the respective figures. In columns named C, figures from an analysis of common vocational learning assignments (n=1,328) by Bloemen (2011) are presented for comparison purposes. Table 1 shows to which extent learning assignments contribute to fostering sub-competences of vocational action competence. Learning assignments can either not consider the respective sub-competence or foster it up to a certain skill level. Depending on the respective sub-competence, each of the four skill levels have different meanings. These different meanings are outlined in lines named level description. E.g. Level 2 in the context of Domain specific competence means Connect. Figures of Table 1 show that vocational action competence is not fostered in a comprehensive manner, neither within textbook package A nor textbook package B. The focal point in both textbook packages is orientated towards fostering domain specific competence. Methodological competence is considered only partially while abstraction, design, social, moral, and ethical competences are ignored almost completely.

Table 1
Frequencies of coded sub-competences

Vocational action competence	Frequencies in %														
	Not considered			Level 1			Level 2			Level 3			Level 4		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Level description	Not considered			Remember			Connect			Design			Reflect		
Domain specific competence	1.0	4.8	3.4	16.7	22.9	70.4	82.1	72.3	19.1	0.2	0.0	4.8	0.0	0.0	2.3
Methodological competence	92.5	96.4	63.7	0.0	0.0	20.6	7.5	3.6	2.8	0.0	0.0	11.5	0.0	0.0	1.4
Moral and ethical competence	100.0	100.0	79.6	0.0	0.0	15.1	0.0	0.0	4.2	0.0	0.0	0.7	0.0	0.0	0.4
Level description	No abstraction competence			Structure knowledge			Communicate knowledge			Develop knowledge			Reflect		
Abstraction competence	98.8	97.1	60.2	1.2	2.3	33.5	0.0	0.0	2.7	0.0	0.6	3.3	0.0	0.0	0.3
Level description	No design competence			Minor degrees of freedom			Anticipate			Major degrees of freedom			Reflect		
Design competence	99.8	100.0	84.9	0.2	0.0	7.6	0.0	0.0	1.7	0.0	0.0	4.5	0.0	0.0	1.3
Level description	No social competence			Recognize interpersonal issues			Cooperative development			Cooperative design			Reflect		
Social competence	100.0	99.4	81.3	0.0	0.0	14.2	0.0	0.6	2.6	0.0	0.0	1.8	0.0	0.0	0.1

In the field of domain specific competence, the focal point is on skill level 2 (82.3% in package A and 72.3% in package B). This skill level requires to connect knowledge and skills gained in former experiences with new learning assignments. A typical example for such a learning assignment is that students are requested to enter a transaction into an ERP-System based on an original voucher whereby the individual steps of entering a transaction have been demonstrated before in a very detailed way. Remembering and reciting knowledge is required in 16.7% (package A) and in 22.9% (package B) of the analyzed learning assignments. Neither workbook package A nor B contain learning assignments for skill level 4 (reflect). A comparison between packages A and B with C shows that package C mainly contains learning assignments for level 1 (remember) while the focal point of packages A and B is on level 2 (connect). These results provide confirmation for the frequently criticized quality of learning assignments. One complaint is that learning assignments with common vocational content mainly foster skills on level 1 (remember) (Bloemen, 2011, p. 116 and Schalek, 2007, p. 211). The majority of learning assignments applying ERP-Systems fosters level 2 (connect) in the field of domain specific competence, while other competences are ignored almost completely. This finding supports the frequently raised concern that the use of ERP-Systems in vocational lessons at commercial colleges takes place as a kind of click training only (see above). In the category openness of problem statement (Table 2), the number of learning assignments without a corresponding problem statement is very low – both in textbook packages A and B as compared to C.

Table 2
Frequency distribution – openness of problem statement

Openness of problem statement	Frequencies (in %)		
	A	B	C
(0) = no problem statement	17.1	27.4	53.7
(1) = problem statement is complete	55.8	61.5	42.8
(2) = problem statement is incomplete	27.2	11.0	3.2
(3) = problem has to be identified	0.0	0.0	0.3
Total	100.0	100.0	100.0

The numbers reflect that learning assignments applying ERP-Systems (packages A and B) are mainly designed application-oriented bearing a realistic vocational problem, whereas common vocational learning assignments (package C) mainly consist of knowledge questions. Also striking is the fact that the number of learning assignments with incomplete problem statements is remarkably high in textbook packages A and B as compared to C. A typical example for learning assignments on that level is that students are requested to reconstruct business transactions from a disordered collection of vouchers and enter the transactions into an ERP-System. Learning assignments which enforce students to identify problems (level 3) are unavailable in textbook package A and B.

Table 3
Frequency distribution – openness of procedures

Openness of procedures	Frequencies (in %)		
	A	B	C
(0) = no procedures required	17.1	27.4	41.4
(1) = procedures completely defined	55.8	61.5	50.9
(2) = procedures partially defined	27.2	11.0	5.1
(3) = viable procedures to be identified	0.0	0.0	2.6
Total	100.0	100.0	100.0

For textbook packages A and B, the results of the category openness of procedures (Table 3) are congruent with those of the category openness of problem statement (Table 2). The reason is that within the respective learning assignments, procedures are closely linked to the respective problem situation – just like in a recipe that describes what a cook should do. Accordingly, only learning assignments with incomplete problem statements allow a variation in procedures as for example applying different methods of entering transactions.

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Table 4
Frequency distribution – openness of results

Openness of results	Frequencies (in %)		
	A	B	C
(1) = one clear result	71.6	89.0	73.2
(2) = few results	28.4	11.0	17.8
(3) = no clear result	0.0	0.0	9.0
Total	100.0	100.0	100.0

As results in Table 4 show, the vast majority of the analyzed learning assignments are aimed at one clear result. With 89.0%, this value is extraordinary high for learning assignments of textbook package B.

Table 5
Frequency distribution – reference to everyday life

Reference to everyday life	Frequencies (in %)		
	A	B	C
(0) = no reference to everyday life	0.2	0.4	12.8
(1) = implicit reference to everyday life	20.6	11.8	49.7
(2) = explicit reference to everyday life	79.2	87.8	31.3
(3) = reflection on everyday life experiences	0.0	0.0	6.2
Total	100.0	100.0	100.0

As the numbers in Table 5 show, most of the analyzed learning assignments applying ERP-Systems are characterized by their explicit reference to everyday life. This is significantly better than the common vocational learning assignments of textbook C. Unfortunately, no learning assignments are available which force students to reflect on everyday life experiences – such as working with an ERP-System in a practice firm or virtual enterprise.

Table 6
Frequency distribution – reference to business processes

Reference to business processes	Frequencies (in %)		
	A	B	C
(0) = no reference to business processes	13.5	24.5	25.2
(1) = reference to tiny working processes	65.1	59.2	57.7
(2) = reference to crosslinking business processes	11.7	6.8	11.4
(3) = reference to comprehensive business processes	9.7	9.4	5.7
Total	100.0	100.0	100.0

In the category reference to business processes (Table 6), learning assignments applying ERP-Systems (textbook package A and B) score better than common vocational learning assignments (textbook C). However, it must be taken into account that the main purpose of ERP-Systems is to support various kinds of business processes. Given this viewpoint, the portions of learning assignments with references to comprehensive business process and reference to crosslinking business processes are quite small.

Table 7
Frequency distribution – representation of information

Representation of information	Frequencies (in %)		
	A	B	D
(1) = one	50.6	58.5	66.1
(2) = integration	49.4	41.5	25.2
(3) = transformation	0.0	0.0	2.4
absent	-	-	6.3
Total	100.0	100.0	100.0

The number of learning assignments on level 2 in the category representation of information (Table 7) is comparatively high. The reason is that in many of the learning assignments original vouchers are used to present information to students instead of just formulating problems in text form. None of the learning assignments require a transformation of information respective to knowledge. An example of such a learning assignment is that students are requested to design a business process as an event driven process chain taking various features of an ERP-System into account. The benchmarks in column D of Table 7 are taken from an analysis of learning assignments by Maier et al. (2010) which is based on 127 learning assignments for the subjects German, Mathematics, Nature, and Social Sciences.

Summarizing the above, it can be said that learning assignments applying ERP-System do not foster the development of vocational action competence in a comprehensive way. In the categories of openness, reference to everyday life and business processes and representation of information, the scores of learning assignments applying ERP-Systems are significantly better than the scores of common vocational learning assignments. However, in each category a lack of learning assignments for the respective highest level can be observed. Therefore, it can be stated that holistic learning in the sense of the constructivist paradigm is not optimally supported by the analyzed learning assignments applying ERP-Systems.

Future research and recommendations for action

The study presented in this article delivers only the first insights into the quality of learning assignments applying ERP-Systems. The current study is limited to Austrian textbooks. For proven results, further research is required. The methodology outlined in this article can act as a basis for future analysis of learning assignments on an international scale. Comparative international studies (e.g. Schalek, 2007; Engelhardt, 2008) have shown a comparably poor quality of common vocational learning assignments. Therefore, it appears reasonable to assume that the quality of learning assignments applying ERP-Systems in other countries is comparably poor as it is in Austria.

The results of the current study show the need for action in order to increase the quality of learning assignments applying ERP-Systems according to the status of research. To foster domain specific competences, learning assignments for levels 3 and 4 – i.e. design and reflection – should be created. Furthermore, learning assignments should be designed that foster other than domain specific competences as well. The results in the categories related to openness suggest designing learning assignments without explicit problem description and which force students to find viable approaches for problem solving themselves. In order to increase reference to everyday life, learning assignments should be created that require reflection of experiences with ERP-Systems in classroom lessons and ideally in a practice firm or virtual enterprise. Offering more learning assignments with references to crosslinking and comprehensive business processes would help increase students' awareness of the impacts particular transactions within an ERP-System can have on other processes within the whole process landscape.

In order to put these recommendations into practice as a next step, the development of learning assignments which take the above recommended requirements into account is required. To make the new learning assignments accessible to a multitude of students at commercial colleges, they should ideally get published in textbooks. Therefore, a tight collaboration with textbook publishers A and B is necessary. Innovations in education are most successful when being implemented by means of learning materials like textbooks (Dubs, 2012, p. 21).

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Using games in business education: an evaluation experiment comparing games to other selected methods in teaching sustainable development concepts

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Abstract

Simulation games are recognized as useful and effective learning tools in the business world, as they create conditions within micro-worlds where participants can experience results of different strategies, which they want to undertake. This use of strategies enables game participants to explore multi-party decision rules and analyse factors that stimulate or hinder the personally desired decision outcomes. Within this context the purpose of the paper is to present the outcomes of an experiment evaluating and comparing an application of a serious game with other teaching methods in the academic study of sustainable development concepts as a part of bachelor's and master's degree curriculum in business management.

The tested hypothesis is that experiencing a designed situation during a simulation game can provide students with deeper understanding of presented complex issues and concepts more effectively than a lecture, text analysis, or discussion. A controlled experiment was conducted in the sustainable development class to test the hypothesis. The benefits from applying the designed simulation game in teaching compared to the selected methods were presented. The importance and value added of a debriefing as well as a designed evaluation of the compared teaching methods were discussed.

Introduction

Serious games are established teaching and learning tools in business. Abt (1970) has already defined them as games that have an explicit and carefully thought-out educational purpose and are not played primarily just for amusement. Corporations in employee trainings often use such games. Games are praised for their efficiency in exploring complexity and they can be used to model and simulate natural conditions in a designed micro-world (Martin et al, 2007).

There are simulation games, such as "Green and Great" and "Lords of the Valley" (CRS, 2014), that are designed with an aim to be experimental and efficient learning methods (CRS, 2014). Learning through experience in real life and in the business world always poses a huge risk and may be very costly because learning means allowing for mistakes and experiments while making decisions. The conditions created and simulated during games, which are simplifications of reality, allow undertaking strategies, taking chances and risks, as well as conducting in-depth analyses that one would not dare to make in real world situations. Examples of such games were described, not exclusively, by: Reeves and Leighton (2009), Aldrich (2009), CRS (2014), Pangiotis et al (2015).

An alternative, artificial world with set-up conditions designed to observe actors' behaviour within a micro-world of pre-defined rules can be a very informative and a self-assessing tool for the business actors. While dealing with the problems of common goods management, the effects of policy implementation, as well as possible scenarios of multi-actor behaviours, can be tested and simulated within the set-up reality. In such conditions, factors conditioning goals achievement can be analysed and simulated. Moreover, alternative pathways, strategies, and negotiations can be explored. Finally, expected risks and rewards from taking the defined decisions can be proved or disproved.

The paper presents the outcomes of an experiment evaluating and comparing an application of a serious game with other teaching methods in the academic study of the sustainable development concept. A controlled experiment was designed to evaluate and compare four different teaching methods such as a lecture, a text analysis, a discussion, and a simulation game. It was conducted in a sustainable development class to verify the hypothesis that a simulation game can give students deeper understanding of complex issues and concepts more effectively than other forms of education. The following sections describe the method of the conducted experiment, elaborate on its outcomes, and present the discussion of results.

Games as educational tool

In order to convincingly and successfully use games as an educational tool in business education, several basic questions must be answered, such as: Are games a good educational tool? Why, when, and for what purposes should games be used? What can be learned during the games and from conducting them?

Games, after engaging the participants, stimulate and encourage exploration of strategies or behaviours that would not have been taken into account in real life due to the risk of failure. Learning by doing is probably the most outstanding feature of the simulation games compared to other traditional teaching methods. In the debriefing after the game, the decisions of game participants and relevant reasoning as well as systems structures and other factors influencing the final results can be analysed and discussed thus, enabling the participants to understand the situation, its causes, and outcomes.

Games are more demanding and resourceful than some other methods of teaching. They usually require extensive preparation from teachers and sometimes from learners. Often they demand special design, set-up, requisites, and a computer-aided simulator. However, there are also some simple gaming exercises that can be quickly performed during lessons without much additional effort (e.g. Sweeney et al, 2011). Games as a learning strategy take more time in concept explanation and in the debriefing. They require from participants: thinking, engagement, and often leaving a comfort zone to try out new experiences.

Role-playing and/or computer-based interactive learning environments have proven to be highly successful in business, social, and military contexts. (CRS, 2014) Within the business context, the application of simulation games can be very wide. In particular, games are effective in studying and practicing effective collaboration, as well as exploring the benefits and costs of participation. Designed for the improvement of human resources management, games allow participants to practice teamwork and acquire interpersonal skills, boost their individual, personal development as well as enhance internal cooperation within a company. Using games in staff training can even lead to improvements of

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information flows or to innovations in management operational structures within companies. Within the field of strategic management simulation, games allow participants to explore risky strategies and their consequences. The domain of sustainability is very interesting to explore, for instance, the systems dynamics concepts, their consequences, and the strategies of common pool resources management.

Games are useful also for research purposes such as data collection, behavioural understanding, and conducting controlled experiments. Exploring collective and personal business strategies in a game can help people to make decisions about investments. An example of such an application to help farmers develop a local product is presented in Martin and others (2007). Moreover, games can be important in decision making to analyse and understand policies, implementation issues, and consequences. A good example is the Floodplain Management Game (Stefanska et al, 2011) that was further developed into the Lords of the Valley (CRS, 2014). A gaming exercise was designed to explore problem-solving and relational activities for river floodplain management. The purpose of the game is to explore complexities and uncertainties of multi-party collaboration. The game Lords of the Valley was conducted several times with water management stakeholders and other actors in Poland. In such situations, decision making rules of various stakeholders with regard to management in the floodplain are made explicit as well as their risk-prone or risk-averse behaviours towards flood risk. These games provide insight into the possible consequences of different strategies of land use management taken by the game participants and allow the analysis of decision rules of stakeholders' actions. Internal dynamics of the teams can be observed, e.g. how they are making decisions, sharing information, and how the actors are dealing with uncertainty and risk. An interesting overview of case studies presenting applications of action research from around the world, including participatory observation, serious games, and role-playing exercises within the field of climate change adaptation is given by van Buuren and others (2014). The action-oriented research methods to exercise feasible governance strategies and instruments for climate adaptation can be used to satisfy the need for both policy-relevant information and scientific knowledge.

Comparative evaluation analysis

A vast literature compares conventional classroom teaching methods with e-learning and distance learning environments (e.g. Black, 2002, Sun et al., 2006) that helps to grasp the criteria and factors that are considered important for the evaluation of learners' progress and teaching methods. Usually the assessment focuses on students' outcomes, such as grade, test scores, student attitudes and overall student satisfaction towards the educational methods.

The effectiveness of a teaching method depends very much on the factors such as learner motivation and aims, attitudes towards education, and willingness to learn, that can be enhanced by learners' personal abilities, personal learning style, initial skills, and preference towards methods (natural or acquired in the education process), as well as teachers' expertise and competencies in delivering the context, design of the methods. and quality of their delivery (clearly and effectively planned and delivered processes, transparent achievable goals, adjusted to the learner's abilities and preferences, engaging personality of the teacher, and timing). The above-mentioned factors are chosen from the P.C. Sun et al (2006) review of critical factors that affect learner satisfaction. Moreover, the teaching method should be suitable for the defined learning goals, such as acquiring factual, procedural, or conceptual knowledge or desired competency acquisition.

The evaluation analysis presented in this paper makes an effort to account for the above-mentioned factors in the designed evaluation process of the chosen teaching methods.

The hypothesis of the serious game conducted in the class on „Sustainable Development" at the Faculty of Management AGH University of Science and Technology in Krakow, Poland, was that experiencing a designed situation during the game can teach students more than a lecture, analysis of literature, papers and case studies, or a discussion. A controlled experiment was conducted in the class to test the hypothesis. Thirty students took part in the experiment. The class composition was quite heterogeneous in terms of sex (70% female and 30% male), nationality (students from: Italy (10%), Spain (10%), Portugal (10%), Germany (10%), Turkey (30%) and Poland (30%), and age (between 20 and 28 years old). A class was in turn experiencing four teaching approaches to the four basic concepts of sustainable development. First, the concepts were presented to the group and students were asked to complete the first questionnaire. The questionnaire was assessing their preliminary knowledge about the concepts and defining the study goals for themselves with regard to each concept separately. Then, the concepts were presented one by one using different teaching approaches. Each teaching approach was evaluated right after the delivery concerning the level of understanding of the concept, the fulfilment of the defined learning goal, and the perceived effectiveness of the teaching method. At the end, the final questionnaire revealed students' preference towards teaching methods before and after the exercise as well as the comparison of the effectiveness and the efficiency of the methods.

The reason for such design of the controlled experiment was that the students could experience all the methods and compare them in order to choose the most effective and efficient one.

Experiment conduct

Concepts to be studied were chosen from interesting issues concerning systems dynamics, which is an important domain for understanding sustainable development ideas, their practical implications, and solutions to the complex problems at stake.

The following four concepts were chosen:

- when there are delays between action and consequence, expect overshoot,
- the surprising power of exponential growth,
- climate change requires habit change,
- the tragedy of the commons.

All of the concepts could be designed and conducted as part of a game (see Sweeney et al, 2011). In the designed experiment, the concepts were presented with different methods as indicated in Table 1.

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Table 1
Analysed concepts and tested methods

Concepts	Methods
When there are delays between action and consequence, expect overshoot	Lecture
The surprising power of exponential growth	Text analysis
Climate change requires habit change	Discussion
The tragedy of the commons	Simulation game

Source: own elaboration

All the teaching methods to be evaluated-- lecture, text analysis, discussion, and simulation game-- had the same teaching objectives incorporated in the methods, namely: explanation of a general idea, deeper explanation of the concept, practical implications, and examples as well as hints for students' own benefits gained from understanding the concept.

Results of the experiment

The evaluation showed that with regard to each concept the group was divided almost half and half to those who wanted to get to know the concept only in general and those who wanted to know more about it, e.g., how the concept can be used in practice and what are its implications for their lives.

Revealing ex-post their general preferences about the learning methods: 70% of the students declared that they learn most when they see and 50% that they learn most when they do things. At the same time, 90% of students declared that they had preferences about the methods before the experiment, in that more than half preferred discussion, about 35% gave their preference to lecture, and the same amount to the game. Only 30% of students after the experiment declared that the way the methods were delivered had an impact on their preferences.

The concepts were not perceived as having equal difficulty levels at the beginning of the course by 60% of the respondents. The easiest was 'climate change requires habit change', more difficult were the concepts: 'when there are delays between action and consequence, expect overshoot' and 'the surprising power of exponential growth', the most difficult was 'the tragedy of the commons'. After the lessons 'the tragedy of the commons' concept, which was delivered through the game, the highest increase in level of understanding by the students was shown. The students also reported that the simulation method was the most effective. The least effective in delivering the concept was perceived to be text analysis. It was visible in both the direct assessment of the effectiveness of the method as well as the ex-post knowledge assessment.

Students ranked the simulation game as the method bringing them the deepest understanding of the concept, next was discussion before the text analysis and the lecture, which was last. Similar was the ranking concerning assessment of effectiveness of the methods. The only difference was that the discussion was appreciated at the same level as the game, as the most effective. However, when it comes to efficiency of the concepts delivery discussion as requiring the shortest amount of time to understand the concept was in the lead, whereas the game was least efficient. Most of the students

were excited about learning by doing and praised discussion and game as interactive, leaving the long-term memories enhanced by experience. However, very often the comments showed that a lecture is the most clear and direct way of knowledge delivery, whereas games are complicated and their results are not obvious and easy to draw on conclusion by the participants. The reason for such assessment can be attributed to 90% of the students indicating lecture as the most often used method in their studies, the one they are most comfortable with, at the same time pointing to the simulation game as the least often used by teachers. Finally, 50% of the students indicated that debriefing discussion in the game was essential to understand the concept.

Discussion of outcomes

Comparing the educational aims of the game with the learning practice of the students, it could be stated that in the designed experiment the game application fulfilled the expectations of both the teacher and the students. The hypothesis that a simulation game can teach students more than other methods was shown to be true as the simulation game was ranked in the evaluation as bringing them the deepest understanding of the concept. Moreover, some students wrote exciting comments about the game (eg. "Most interesting was the game. Lessons brought by the game will last in the memory for a long time.", „The most interesting, new, and difficult was the game. It show the consequences of actors' behavour."). At the same time, the other evaluated methods were also praised for their merits. The overall assessment of the discussion showed that students perceived it as having similar advantages as the game, and in particular it was favoured in terms of efficiency of the concept delivery.

There are several factors that can influence drawing conclusions in such experiments. First, in the conducted experiment the statistic probe was very small to generalize the outcomes on a population. Then, a concept might be better suited to be presented by one method than the other and it can influence the outcomes. Next, the results of the experiment may depend on the quality of the delivered teaching method. Lecture can be unclear, too difficult, complex, and poorly presented. The text for the analysis can also be too difficult, complex, and unclear. The discussion very much depends on the preparation, knowledge, and experience of discussion participants as well as on engaging and evoking questions. In the discussion participants learn from each other. It is a two-way communication where rising doubts can be clarified, but only until the level of knowledge of the fellow-participants. Discussion is a good way of enriching the context. Lecture, as well as text analysis, brings expert knowledge on board. To the large extent, these methods are based on one-way communication with the risk of not reaching the audience at all, in case people get lost in the context. However, when questions allowed, the understanding might be as planned. In simulation games, characteristics of all the previously described methods are present and it is even more engaging than the discussion as taking action is required from the participants. Experiencing consequences of actions is evident to the participants. There is discussion in the debriefing that is essential in a good game of educational aspirations. However, it is possible that understanding the full complexity of a simulation game might not be feasible for the players. This depends very much on the game design and set-up, the complexity of the rules, and finally on the debriefing. The comparison of the analysed methods is presented in Table 2.

Table 2
Comparison of the analysed methods

Teaching methods	Communication	Engagement	Knowledge	Experiencing consequences	Assessment, competency acquisition	Collaboration joint-problem solving, exchange of views
Lecture	One-way (to a large extent)	Low	Expert	Described	No	No
Text analysis	One-way (to a large extent)	Low	Expert	Described	No	No
Discussion	Two-way	High	Participants	Discussed	No	Yes
Simulation game	Two -way	Very high as action is required	Participants	Experienced	Yes, through Debriefing	Yes

Source: own elaboration

There are factors hindering gaining maximum benefits from the methods. Personal learner's ability is one of them. Different methods may be better suited for different types of personalities. A simulation game presents a model (a designed and controlled part) of the real life complexity within the aim to experiment and posses' knowledge or competences. Interpersonal behaviours can hinder or misguide understanding of the pure concept in the simulation game in the same way as behavioural factors are questioning the basic rules of rational economics deduction principles.

Conclusions

Simulation games are very effective and at the same usually very demanding teaching methods. To their merits belongs, among others, very high level of participants engagement bringing experience driven, deep understanding of the concept.

Depending on the various factors and criteria, adequate teaching methods can be selected to deliver the concepts most effectively and efficiently. While different methods are suitable for different goals and the successful teaching very much depends on the adequately designed and professionally conducted method as well as on learners ability to appreciate it, the words of Confucious remain valid: „Tell me, and I'll forget. Show me and I may remember. Involve me, and I'll understand." The conducted experiment doesn't prove that every concept is suitable to be presented using a simulation game. However, using the synergies of conventional and unconventional teaching methods in order to enrich the content is a good way of evoking learners' potential and interest.

The conducted experiment can be seen as a pilot study for evaluation of using games in teaching complex sustainable development concepts to an international audience at the university level. The study was conducted on the international group of students, bringing in variety of teaching and learning experiences. Therefore, its results can be meaningful for further research on the most effective teaching methods of sustainable development concepts within the international context. Further research can be

conducted concerning, for example, implications of cultural differences on teaching and learning preferences using games. It is desirable as the perceptions and reactions in low-context and high-context cultures as well as rule-based and relationship-based cultures are very different (Hooker, 2003). Questionnaires eliciting not only teaching and learning preferences and experiences, but also students' background, as well as cultural preferences can be used in follow up research. Such study can help to understand the effectiveness of using games in international business education within the sustainable development field.

Acknowledgement

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Design is our Success – the Importance of Modeling a Virtual Enterprise

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Abstract

Virtual Enterprise is a multidimensional teaching method based on a business simulation for learning purposes. In a Virtual Enterprise, students execute procedures similar to real-life companies in a virtual market economy. To enable that students can act according to existing business principles, teachers must design this Virtual Enterprise as an economically valid business model. This paper discusses the importance and the process of modeling and introduces several ways of designing a Virtual Enterprise for different learning objectives.

Introduction

Virtual Enterprise (VE), in Europe also called Practice Enterprise or Practice Firm, is a complex learning and teaching method. It can be defined as a business simulation for learning purposes. There, students learn and act in the spirit of entrepreneurs. Instead of attending classroom lectures on different subjects like accounting, advertising, or management, students operate their own business where they become managers, employees, or even entrepreneurs. They apply business skills and work independently in appointed offices while carrying out all necessary business operations associated with their respective firm (Borgese, 2003; Riebenbauer, Stock & Slepcevic, 2009).

In order to exploit the main benefits of this method, an appropriate learning environment has to be created by teachers and responsible education institutions. By simulating a virtual market economy, procedures similar to those found in real-life companies can be executed according to current business rules and legal restrictions. This close-to-reality learning place enables trading and cooperation between the Virtual Enterprises within the national and international network for Virtual Enterprises. However, this learning concept distinguishes itself from the real world of business as the flow of goods and services as well as the money transactions are not real (Berchtold & Trummer, 2001; Trummer, 2004).

The national and international network for Virtual Enterprises is established, coordinated, and maintained by central offices. They enable regional and transnational business activities by constructing an economic setting with all necessary macro-economic functions. Central offices complete the Virtual Enterprise market and provide commercial services such as bank, chamber of commerce, custom and taxation, post office, telephone, and insurance companies (Europen-Pen International, 2014). During the foundation, a Virtual Enterprise achieves access to the market with all services by inscribing itself in the

commercial register. The national central offices administrate these registers and transfer the data to the international network. The most important international network is called Europen-Pen International and has a growing number of members. While about 5,200 firms were recorded in 2007, there are already over 7,600 registered Virtual Enterprises in 2014. The main Virtual Enterprise countries are Austria, Slovakia, Germany, Romania, China, and the United States (Riebenbauer, 2007; Europen-Pen International, 2014).

To summarize, the method Virtual Enterprise can be described as a virtual learning environment which

- simulates an enterprise,
- emphasises business activities and economic procedures,
- acts in a national and international market with an increasing number of participating members in the network,
- employs students, who learn and work within an adequate environment,
- deals with fictitious goods and services as well as fictitious flows of money,
- uses modern communication technologies and IT equipment for real contacts with employees of other Virtual Enterprises (Gramlinger, 2004).

The purpose of this paper is to focus on the importance and the process of modeling a Virtual Enterprise in order to enable self-regulated learning and acting of students. Several ways of designing a Virtual Enterprise for different learning objectives are discussed.

Learning and teaching in a Virtual Enterprise

Business education intends to arouse entrepreneurial spirit and to prepare for self-employment as well as for personal independence in all vocational (and also private) contexts. This means that a person has to be able to solve problems independently according to a given situation in life (Peterssen, 2009). Therefore, education should prepare learners to handle complex problems in a goal-oriented manner, autonomously, and self-responsibly, as well as to acquire professional, social, methodological, and personal competences.

Competence-based learning concepts are derived from the theories of vocational and progressive education of the 19th century. At that time, Dewey and Kilpatrick developed the project method with the learning wheel including the four steps: purposing, planning, executing, and judging (Dewey, 1994). Educational programs must include complex tasks and problems which enable learners to carry out their actions with an increasing degree of autonomy. This aim can only be reached when students find learning opportunities where they can experience complete acting – that means they are able to go through all four steps: purposing, planning, executing, and judging.

Virtual Enterprise as a method offers an innovative environment which can be considered from a learning and a business perspective (Trummer, 2004). Virtual Enterprise is different to any other classroom lesson. On the one hand teachers are responsible for maximizing the learning outcome of the individual student and on the other hand it is their task to take care that students succeed on the market with their Virtual Enterprise. As a result, the classic roles of an instructor in a Virtual Enterprise

are the role as a teacher and as an executive manager. However, instructors may not fulfil these roles in the traditional perception. As it is one of the main objectives to promote the students' autonomy, it is neither the task of the instructor to lecture nor to tell the students what to do with their company. It is not necessary to know answers to all questions, but to inspire ideas, thus helping students to find a solution and initiating reflection as well as discussion of the results. Therefore, in a Virtual Enterprise the teacher is rather seen as a coach, moderator, designer, consultant, mentor, and facilitator (Berchtold & Trummer, 2000). Being a teacher in a Virtual Enterprise is a very challenging job as they are always role models. Only when they get fully engaged and involved with the Virtual Enterprise will the students do so as well.

Students also have two roles in a Virtual Enterprise. First they are learners and then they become employees, too. Students are integrated in the phases purposing, planning, executing, and judging with both functions. As learners, they go through this process to achieve their fixed personal learning targets and to maximize their individual learning progress. As employees, they accomplish the four steps to maximize the success of a Virtual Enterprise. Because of their rising autonomy, they thereby take over more and more management tasks (Berchtold & Trummer, 2000).

Students execute a variety of business functions in an adequate Virtual Enterprise office. As employees they choose a position in a process or department in which they want to work and learn. Typical divisions are comparable to those found in real enterprises e.g. management, administration, accounting, human resources, purchasing, sales, and marketing. Students appear as buyers and sellers on the national and international market and handle any sort of business which is required for their particular Virtual Enterprise. For this purpose, it is necessary that they use new technologies like websites, e-commerce tools, web conference software, and podcasts. In order to be successful, students have to understand strategic, structural, and operational matters. At the beginning of the term, they compile a mission statement and write a business plan from which they derive objectives as well as action plans for several departments. Monthly reports and annual statements are composed to control the business activities. After implementing their action plans, they analyze the results and reflect upon their actions and learning outcomes. It is very important that the learners' autonomy grows step by step during the course. At the end of the Virtual Enterprise time, students complete their assessment sheets and portfolio (Riebenbauer, Stock & Slepcevic, 2009).

Modeling a Virtual Enterprise

The didactical challenge with the complex method Virtual Enterprise is to offer the students a simulated enterprise where they can learn in and on the model. This business model does not originate by itself, it must be created and advanced actively by the teacher. In this context it is important to always focus on the learning and on the working site (Stock & Riebenbauer, 2013).

Figure 1 illustrates a model for learning and working in a Virtual Enterprise which was developed at the University of Graz in order to procure essential connection of the method Virtual Enterprise (Berchtold & Stock, 2005). In the center of this model is the cycle as a core element for the learning site. It shows that students are required to plan, execute, judge, and purpose their learning process and work on their own. The house symbolizes the company of the particular Virtual Enterprise, where all students do their day-to-day business. The outer meta levels represent an additional perspective for teachers with their theoretical background know-how. Meta level 1 demonstrates the business model, how the simulation

is designed in a realistic way in order to enable goal-orientated working and learning. Meta level 2 shows the pedagogical background for leading a Virtual Enterprise as a teacher. It contains the several roles of a teacher, different methods, and pedagogical tasks.

Figure 1. Model for Learning and Working in a Virtual Enterprise (Berthold & Stock, 2005).
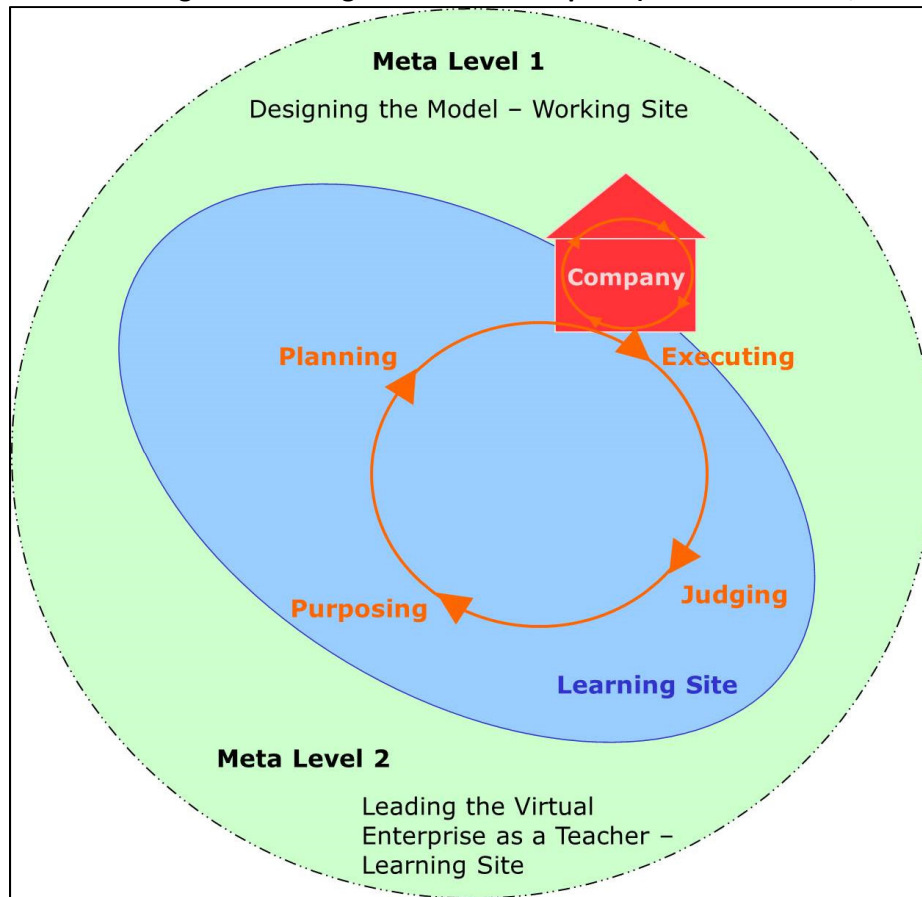
For business teachers it is a major challenge to design an adequate learning environment where students can act independently as employees or managers while carrying out the tasks associated with their respective business. However, a realistic modeling is a precondition for a successful Virtual Enterprise which is based on a deep understanding of the connection of business elements and procedures as well as learning concepts and pedagogical tools.

Virtual Enterprise as a business simulation

The Virtual Enterprise exists only for learning about business strategies, organizational structure, and market processes within this simulation. A special facet of the teacher's responsibility is the design of the simulation itself. Students can experience, scrutinize, and reflect upon business principles, economic systems, and market conditions only with a valid and realistic modeling of the Virtual Enterprise. This needs a complete, harmonious, and concrete model of a real enterprise. It is the task of a teacher as a

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designer to provide a framework and to take care of the general conditions so that learners can set goals, plan, execute, and judge the required actions in an increasingly autonomous way (Stock & Riebenbauer, 2013).

On the one hand, the virtual economy has to be designed to enable a national and international trading between the Virtual Enterprises. The central offices coordinate the network and allocate market facilities. On the other hand, every individual Virtual Enterprise needs to be simulated by the teacher. The following procedure has to be considered when forming a model to build the working site of a Virtual Enterprise.

A model always depicts the illustration of the original rather than presenting the reality or actuality (Tramm & Gramlinger, 2006). This means that the original already is based on subjective perceptions, knowledge, and experience of the modeler and thus is a subjective cognitive representation of the object of experience 'business' in the minds of the model designers (Tramm, 1996). Based on the original, the modeler constructs a first internal model of the company. This model is reviewed and adjusted by reference to scientific and situational representations of the company. Scientific representation may, for example, include relevant theories and models of business studies, economics, and sociology. The situational representation, however, refers to the consideration of individual cases (casuistry) of economic practice. The result of this first transformation is a practically oriented, science-based picture of a company (Reetz, 1986).

The second transformation in the context of the modeling process consists of three steps: In the first phase operational reality is simplified. Operational complexity and variety are reduced by excluding irrelevant aspects of reality. From a system theory point of view, this approach requires a reduction of the subsystems and their mutual relationships. Examples of subsystems in the Virtual Enterprise are the departments in relation to the overall business or workplaces in relation to the departments. In the second phase, the substitution, a physical, or just symbolic representation of the model takes place. For example, the Virtual Enterprise is usually physically represented by an open-plan office. In contrast, any production facilities or warehouses are usually represented only symbolically. In the third phase, an accentuation of certain features of the business model takes place. This accentuation is done by highlighting and dispensing certain features, for example in the formation of operational processes (Reetz, 1986). The result of the second transformation is a model of the Virtual Enterprise as a business. It is compared to the original, consciously changed, and turns into a learning location with special (educational) character (Reetz, 1977).

Figure 2 is based upon the research on model construction for learning enterprises by Reetz (1986) and demonstrates the process of modeling the business site of a Virtual Enterprise.

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Figure 2. Process of modeling a Virtual Enterprise (Reetz, 1986; Moser, 2013).
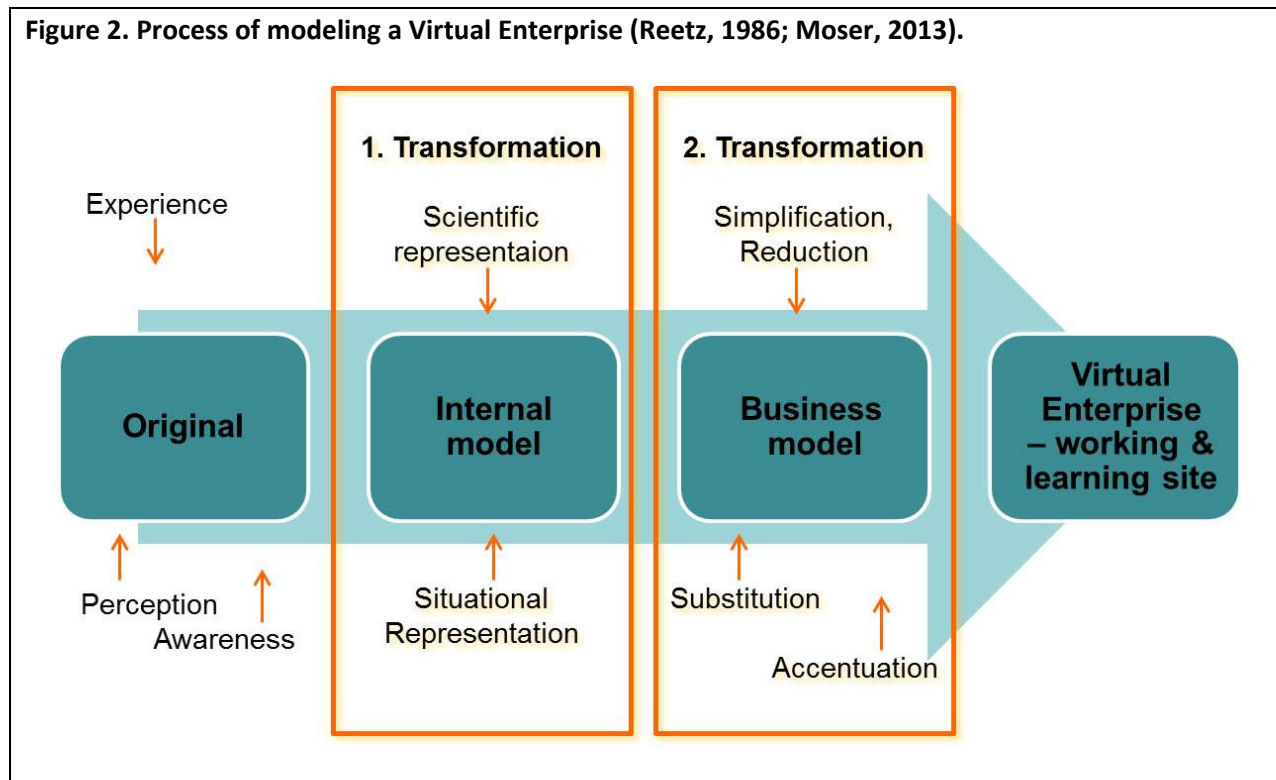
Virtual Enterprise as a working and learning site must not lose the economic purpose or lead to a distorted image of reality. It is the task of the teacher to offer challenging, but not trivial, learning opportunities for the individual learner. Based on these experiences, students are then able to analyze economic interconnections and business processes as well as to reflect upon the impact on one's own actions and learning results.

Methods for Modeling a Virtual Enterprise

There is no one and only method for modeling the Virtual Enterprise. Rather are, among other things, the purpose of the business, professional experience, and contacts with industry as well as the teachers' preferences and tendencies determining what tools and methods are used for the modeling. Some of them will be briefly introduced here (Riebenbauer & Stock, 2007):

Partner company – cooperation with real enterprises: This is the classic form of data modeling. A real company is a model for the simulation of the Virtual Enterprise. Simplifications and adaptations need to be made for a coherent Virtual Enterprise model. The partner company concept presupposes a good and lasting connection with the real company.

Business model: The business model is an attempt to analyze several core areas of a company and to illustrate production and operational systems. Working with business models is usually very complex. Key figures of relevant industry or business line: The great difficulty to be able to plan adequate expenses according to achieved sales can be overcome by the use of such key figures. In connection with the granting of credits, banks as well as insurance companies and chambers regularly calculate key

figures for internal use. These key figures can be used for modeling a Virtual Enterprise. Working with key figures is a practical method and the construction of an economically consistent model can be made considerably easier with them.

Business plan: The business plan is an extremely helpful tool in supporting the simulation work or modeling. The business plan, with its structure, provides a guideline for all core areas which are taken into account in the modeling of a company, whether in founding or during the continuing operation of it.

In addition to collaborating with a partner company, the combined use of business plans and key figures is a practical method for modeling a Virtual Enterprise. First, the structure of the business plan constitutes the basis and then the key figures are considered to complete the realistic data modeling. The goal of all efforts related to the modeling of the Virtual Enterprise is that it should provide a comprehensively coherent model of a learning framework that allows learners to identify what connections between their actions and the consequential – but often occurring far apart in time – results exist (Berchtold & Stock, 2005). The Virtual Enterprise therefore provides a good and practical preparation for professional life by working in and on a realistic business simulation.

Conclusion

Virtual Enterprise as a business simulation is a complex and innovative teaching method. For business teachers it is a major challenge to design an adequate learning environment where students can link existing knowledge with new practical experiences, experience working attitudes, and as a consequence acquire key business competences. A realistic respectively economic valid modeling of a Virtual Enterprise is a precondition that learners can scrutinize, discuss, and reflect upon business processes, market conditions, and economic relationships. The actual design of this business simulation is critical for the learning success of the method Virtual Enterprise. Requirements for an appropriate design were discussed based on the three levels of a Virtual Enterprise: business site, learning site, and meta-perspective. Additionally, different forms for modeling were introduced in this paper. Whereas besides the cooperation with a real partner company, the combination of business plan and key figures of the relevant industry or business line turns out to be especially useful for this central task of the teacher.

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Service Learning in business education: What perceptions and expectations do undergraduate and graduate students have of service-learning courses?

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Abstract

Service Learning is a modern teaching-learning concept, which combines curricular content with supporting charitable organizations. The effects of courses using this concept on the students' competences development has already been described in empirical studies. Within these studies the aspects regarding the instructional design were less emphasized unlike in this paper in which they are focused on. In addition to a conceptual foundation of service-learning and a literature review on the impact of service-learning, two didactic prototypes will be presented in the form of empirical case studies. The focus of this research is to describe the attitudes and perceptions of undergraduate and graduate students attending service-learning courses and which conclusions can be drawn on the instructional design. In this article, the concept of service-learning is understood as a course- and credit-based learning and teaching method (in contrast to community-service), which require a specific instructional design to evolve purposeful and curricular learning connections between the course and service projects outside the course.

The values of service-learning in business education

A main challenge in the instructional design of Business Education is to find a balance between academic rigor and the practical needs for future business situations. For instance, Godfrey, Illes, and Berry (2005) analyze that business education has a paradigmatic narrowness of a transactional view of human interactions and therefore students develop a strong material orientation. Aspects regarding social needs in a society and responsible acting in business situations are neglected. The instructional concept service learning can be a potential solution for this because it combines academic contents with real life learning experience in the context of civic responsibility. In service learning, students deal with a specific problem situation that fits a community need and requires the application of business content in real life situations. The reflection of this activity cannot only foster a better understanding of given business contents of the curriculum but also the students' values and attitudes towards civic responsibility (Gerholz & Losch 2014). Therefore, service learning offers business educators a teaching and learning tool that can help them solve the challenge to combine academic rigor and practical needs.

In the last two decades a growing number of business education institutions have implemented service-learning as an educational approach to foster their students' knowledge acquisition and personal development (Kenworthy-U'ren & Peterson 2005). Beyond that, empirical studies revealed that service learning fosters academic skills, personal insights, and understanding of social issues among students (Yorio & Ye 2012). However, the existing empirical studies mainly focused on specific learning outcomes rather than on the relationship between the specific teaching and learning design of a service-learning course and its effects. Therefore, the focus of this paper is more on the teaching and learning perspective of service-learning. This article is intended to present a conceptual framework for service-learning and comparing the attitudes and perceptions of undergraduate and graduate students attending such. In doing so, section two presents a foundation of service-learning (2.1) and design characteristics for service-learning courses based on empirical studies (2.2). In section three, two empirical case studies in the form of an ex-ante analysis are presented, which illustrate the expectations of service-learning students and the relationship between instructional design and the students' perceptions. The design for service-learning courses also takes into account whether there are undergraduate or graduate students. Andrews (2007) argues that the integration of service-learning in business curricula is challenging, especially for undergraduate students because this curricula content is mostly standardized. Case Study 1 refers to undergraduate students whereas Case Study 2 refers to graduates students (3.1 and 3.2). The findings offer important orientation in regard to the target groups and their perceived instructional design of service-learning courses.

**Service-learning: A didactical and an empirical view**

Didactical conceptualization of service-learning

Bringle & Clayton (2012) define service-learning as a "course or competency-based, credit-bearing educational experience in which students (a) participate in mutually identified service activities that benefit the community, and (b) reflect on the service activity in such a way as to gain further understanding of course content, a broader appreciation of the discipline, and an enhanced sense of personal values and civic responsibility." (p. 105). The term 'credit-bearing' demonstrates a link to the curriculum and in the definition it is shown that service learning is mostly course-based. This represents also the dissociation to 'community service', in which students also support the community, but it is not embedded in a curriculum or course. All in all, as defined, service learning has a learning perspective as well as a community perspective.

The learning perspective refers to the combination of academic contents and real life experiences in a service-learning course. The experience in the service-learning course refers to the specific service activity the students work and reflect on, based on their academic knowledge. Therefore, service learning can be described as a type of experiential education. Kolb (1984) defines learning as a "process whereby knowledge is created through the transformation of experience" (p. 41). Particularly the reflection of this experience is important for forming abstract concepts (Kolb & Kolb 2005). Thus, the impact of service-learning depends also on the intensity of reflection. In accordance to Godfrey, Illes, & Berry (2005), reflection referred to the balancing of the students' internal elements and the external elements of the service experience. Consequently, it is important that students reflect about their experiences and knowledge acquisition during the service activity. The latter comprises the content of the curriculum as well as the personal insights regarding the community needs.

The community perspective refers to the civic role of higher education. It is influenced by the work of Dewey and his idea that a democratic society will only work with engaged citizens. Therefore, it is an aim of higher education to prepare students to be responsible citizens. For Dewey (1966), a civic learning process is provided when students are engaged in the community and given problems. The latter focuses on the service activity, in which the students are faced with real social issues (e.g. poverty, charity, human dignity). The students work on the given social issues, including corresponding problems. Furthermore, it is important that students and a community partner, like a charity organization, build a reciprocal relationship. Both parties have specific kinds of knowledge and experience that bring together an essential contribution to solve the given community problem. Brower argues that this reciprocal gain is an important factor leading to the initial and sustained success of the service-learning course (Brower 2011, p. 63).

All in all, service learning can be described as a holistic concept in which different teaching and learning approaches like experiential learning, problem-based learning, and cooperative learning are assigned. A common ground is the differentiation between service and learning activity. In doing so the student is carrying out a working process in the service activity. This is connected to the learning, process and an acquirement of skills and personal insights (see figure 1). It is an action-oriented approach of service learning where the students are confronted with a community problem (action context), which they should solve (action process) to reach a valuable contribution to the community's needs and their own competence development (action result). How students perceive these elements depends on the perspective. During the service process students should clarify their service problem, work on this, and should come to a result that improves the community. During the learning process students should be motivated towards the service activity and should discover and apply the relevant academic content that they need to solve the community problem. At the end they should reflect on their learning process, that is the learning result. (Gerholz & Losch 2014).

Figure 1: Action-oriented approach of service learning (Gerholz & Losch 2014)
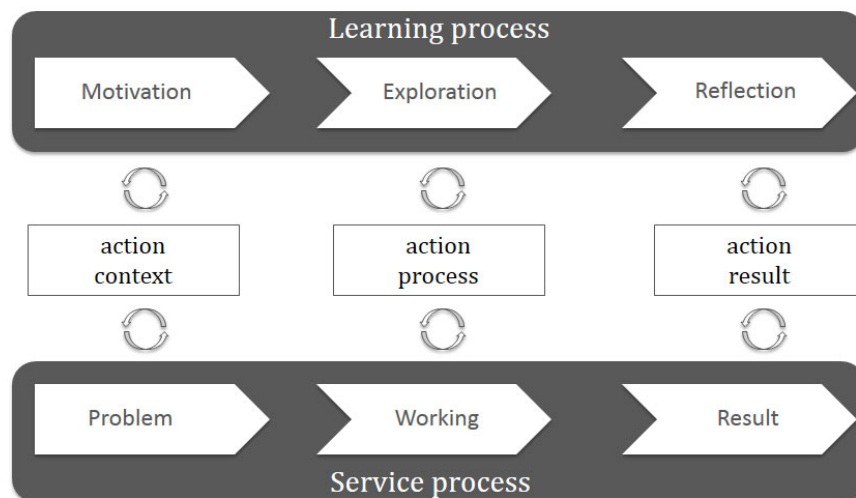
The differentiation between service and learning process represents an analytical conceptualization. The service process and the learning process are interdependent. It is comparable to the 'organic connection' between the service experience and attitudes and knowledge of the student founded by Dewey (1998). The 'organic connection' means that in service-learning courses students should build a relationship between their professional and personal competence development and the work on the service activity. To help students to do this, a teaching and learning clarification is needed. That includes the adaptation of the service problem concerning a connection to the academic content, the support of the students during the work on the service activity, and helping the students reflect on their service and learning process.

Empirical evidence to the impact of service-learning

In parallel to the increase of service-learning in business curricula, a growing interest in research of service-learning can be observed. Empirical studies on the impact of service-learning have revealed that academic skills, for instance critical thinking or problem-solving skills, during service-learning can be promoted (Govekar & Rishi 2007, Prentice & Robinson 2010). This does not indicate that also differences in academic performance between service-learning students and non-service-learning students exist (Prentice & Robinson 2010), although there are indications. Herbert & Hauf (2015) were able to show that a service-learning design contributes to a better understanding of course content. Nevertheless, students in service-learning courses have a higher perception of their self-efficacy and learning success than students in traditional courses (Yorio & Ye 2012, Reinders 2010, Peters, McHugh & Sendall 2006). Furthermore, service-learning can make a contribution to development of civic attitudes and engagement. For instance, Yorio & Ye (2012) revealed in a meta-study that service-learning fosters an understanding of social issues and the personal development of students (Yorio & Ye 2012). Other studies have shown that students reflect and develop their civic attitude, civic responsibility, and empathy with social issues in service-learning courses (Govekar & Rishi 2007, Astin, Vogelgesang, Ikeda

& Yee 2000, Weber & Glyptis 2000, Astin & Sax 1998). Also, the willingness to be engaged can increase through service-learning courses (Prentice & Robinson 2010, Reinders & Wittek 2009). Moorer (2009) has shown that graduate students have a higher sense of civic responsibility than undergraduate students at the beginning of a service-learning course (p. 69).

The existing empirical studies have focused on specific learning outcomes rather than on the relationship between the instructional design of a service-learning course and its effects. However, some studies concentrated on didactical elements in service-learning courses. Yorio and Ye (2012) have revealed that credit bearing service-learning has a stronger impact on the competence development than an extra-curricular service-learning arrangement. For the learning process and success respectively it is important to support students for recognizing the connection between curricular content and service activity during the service process (Prentice & Robinson 2010, Batchelder & Root 1994).
All in all, a general comparison of the results should be considered cautiously. The conducted service-learning courses in the cited studies have several variations in their teaching and learning realization. Beyond that, the studies have used different forms of methodical design and measuring instruments. Therefore, a context sensitive comparison is needed. However, a trend can be shown that service learning has the potential to foster the professional and personal competence development of students. Nevertheless, the design of the learning and teaching criteria is only mentioned briefly. Based on that, the following case studies focus on the relationship between instructional design of a service-learning course, perceptions and attitudes of service-learning students.

Empirical case studies: Perceptions of undergraduate and graduate students of service-learning courses

Interest and Research design

The interest of the two single case studies (Yin 2003) is a description of the attitudes and expectations of undergraduate and graduate business students prior to them attending a service activity. Therefore the case studies are based on an ex-ante evaluation to evaluate the quality of a program – here the service-learning courses – before it is launched (Camphel & Rozsnyai 2002, 132; Moorer 2009, 66). It is about the idea to analyze the target group of a service learning-arrangement to find indications for an adequate teaching and learning design of service-learning courses in business education and whether the intended impact is possible.

Research design in the case studies

To examine the attitudes and perceptions of the students in both case studies a mixed method-approach in a convergent parallel-design (Creswell & Clark 2010) was used. Table 1 shows the methodology of the case studies.

Table 1
Case Studies: Methodology and context

		Case study 1		Case study 2	
students		Undergraduate students		Graduate students	
groups		experimental group	control group	experimental group	control group
teaching and learning method / instructional design		service-learning	instructional-based	service-learning	problem-learning
quantitative data	collection	questionnaire (self-report) n = 39	questionnaire (self-report) n = 17	questionnaire (self-report) n = 18	questionnaire (self-report) n = 29
	analysis	Variance and correlation analysis		Variance analysis	
qualitative data	collection	semi-structured interviews with every group (n =10)		semi-structured group-interview with the whole group	
	analysis	Qualitative content analysis		Qualitative content analysis	

The data collection was in an experimental-control-group-design at the beginning (after the first module session) of the service-learning course (experimental group) and the traditional course (control group) respectively. At this point, the service-learning students had already met once with the charity organizations. In the traditional course, the instructional design in case study 1 was a traditional instructional-based teaching method and case study 2 has a problem learning design, in which the students work on a specific project (in the field of knowledge management) in groups.

In regard to the quantitative data, self-report questionnaires assessed the students' self-efficacy (10 items), self-concept (5 items), attitude to be engaged (6 items), and subjective learning success (7 items) (e.g. Reinders 2010, Mabry 1998). A 6-point likert scale was used. Furthermore, the undergraduate service-learning students in case study 1 were asked for their reasons for attending the service-learning course. The reliability of the used scales are good to excellent (case study 1: .78-.87; case study 2: .73-.78)

Concerning the qualitative data in case study 1, semi-structured interviews with two students in each service activity were conducted at the beginning of the service-learning course. In case study 2 a group interview (Lamnek 1995) with five students at the beginning of the service-learning course was conducted. To analyze the qualitative data in both case studies, a qualitative content analysis (Mayring, 2010) was used.

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Case study 1: Attitudes and expectations of undergraduate students
Context of the case study 1.

The context of Case Study 1 is a service-learning course (experimental group) for undergraduate students at a business faculty in Germany. The design of the course was problem based. The students worked in groups to solve existing problems at charity organizations in the given community. Examples for the service problems are the development of an advertising campaign to acquire new volunteers for a charity organization or the optimization of investment management of a vehicle fleet in a charity organization. In the course of problem solving the students drew on scientific methods, which represented the academic content of the course. Thus, the service-learning course has a connection to relevant business contents as well as to scientific methods in social science. Altogether 39 undergraduate students (27 female and 9 male with an average age of 24.6 years) worked in six groups and each group had to work on a different service activity.

Findings in case study 1.

In the analysis of the differences between service-learning students and students in the traditional course, a factor variance analysis has shown that there is a moderate effect in the subjective learning success ($F_{(1,53)}$ = 9.554, $p < .01$, $\eta2$ = .160); other significant effects could not be found. Thus, the students in the control group have attributed their expected learning success less (mean = 3.85, sd = 0.88) than the service learning-students (mean = 4.56 , sd = 0.68). Based on that, a correlation analysis (see table 2) was made regarding the reasons of the service-learning students to attend the service-learning course.

Table 2
Correlations reasons attending service-learning course and constructs

Scales / reasons for service learning-course	Subjective learning success	Self-efficacy	Self-concept	Attitude to be engaged
Relevance of practical application: For me, it is important to can apply my knowledge in real-life situations	0.481*	0.205	-0.094	0.558**
Charitable aspect: For me it is important, to have the possibility helping charity organizations.	0.324	0.079	0.324T	0.709**

A significant correlation can be shown in relevance of practical application and the subjective learning success. The results of the content analysis provide an orientation, why students weighted the practical application higher than the charitable aspect. All in all, 29 indications were found for reasons to attend the service-learning course. 52 % of these indications refer to application of knowledge in real-life

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problems (e.g. "For me it is definitely the practical relevance"; „The main reason was the practice-orientation.") and 6 % of the indications relate to a charitable aspect („yes, it does have the social aspect and charitable organizations"; „that one also gets the chance to work with charity organizations "). Other aspects have often been mentioned for pragmatic reasons (24 %) and the form of assessment of the service-learning course (17 %) could be identified. Beyond that the correlation, analysis also shows significant results between attitude to be engaged and the relevance of practical application and charitable aspect.

Based on the correlation analysis, the question arises: what kind of skills will be developed during the service-learning course from the students' point of view and is there a connection to the service activity? An ANOVA has shown that there is a high effect between the several groups and service activities respectively in the perception of the subjective learning success (F (5,36) = 5.36, p < .001, η2 = .493)). The results of the content analysis show indications that the service-learning students expect a development in their professional and problem-solving skills (e.g. methodological expertise in general or also applying it), social skills (e.g. "slightly advanced conduct of conversations"; „social areas provided by co-operation partners to get in touch"), and personal skills (e.g. „take responsibility for such things"). A clear trend between assessment of learning success in several groups and the expected development of skills could not be found.

In addition, an ANOVA reveals a main effect between the student groups in several service activities and their perception of the self-efficacy (F (5,36) = 4.57, p < .01, η2 = .432). The results of the qualitative data analysis show that the students differentiate between group work and solving the given service problem of the charity organization. In regard to group work 37 comments could be found from which 76 % (28 comments) are positive (e.g. "group is fine, everything is harmonious") and 24 % (9 comments) are negative (e.g. "if I did this all alone I would get on faster"). In contrast, the students expected the work on the service problem to be more challenging: 92 % (22 indications) are negative comments. Here indications can be found regarding the service process (e.g. "demanding a lot from the non-profit organization and not being able to meet the expectations in this short time") and the learning process (e.g. "we have enormous difficulties to narrow the problem down", "the know-how, what do we really do [..] this is really the problem"). In the data, a moderate trend can be found that the groups expected challenges in the service process as well as in the learning process that assess their self-efficacy lower.

Case study 2: Attitudes and expectations of graduate students
Context of the case study 2.

The context of Case Study 2 is a service-learning course for graduate students at a business faculty in Austria. The didactical design of the course was basically similar to that in Case Study 1. The students also worked in groups to solve existing problems at charity organizations in the given community.

Examples of the service problems are the development of a marketing plan for an organization serving long-term unemployed, supervising the accompanying reflection of a measure to increase the employability of young adults, or the development of a fundraising strategy for an organization caring for refugees. In the course of problem solving, the students drew on scientific methods, which represented the academic content of the course. Thus, the service-learning course had a connection to relevant business content as well as to scientific methods in social science. 18 graduate students (11

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female and 7 male with an average age of 28.8 years) worked in four groups and each group had to work on a different service activity.

Findings in case study 2.

In the analysis of the differences between service-learning students and students in the traditional course, a factor variance analysis has shown that there are effects in the self-concept and subjective learning (see table 3).

Table 3
Comparisons of means between service-learning course and control group

Scales		mean	sd	p	F	η2
Self-efficacy	service-learning course	4.71	0.63			
	control group	4.69	0.67	0.914	0.012	0
Self-concept	service-learning course	3.77	1.09			
	control group	2.96	0.83	0.006	8.239	0.155
Attitude to be engaged	service-learning course	4.81	0.76			
	control group	4.66	0.67	0.487	0.491	0.11
Subjective learning success	service-learning course	4.93	0.54			
	control group	4.43	0.82	0.16	5.133	0.102

The students in the control group have attributed their learning success less (mean = 4.43, sd = 0.88) than the service-learning students (mean = 4.93 , sd = 0.54). The service-learning students had on average a significantly more pronounced self-concept (mean = 3.77 in comparison to mean = 2.96). Within the service-learning course, however, no differences are shown among the four project groups.

The group interview revealed that graduate students primarily have a more critical look at the questions concerning the project management and implementation of the project at the beginning of the project.

In the case of project management, mainly questions about the organization are put into the foreground ("of course we set up our own Dropbox for the group"; "the first two appointments [with the organization] have already been set"; "the distribution of the work load within the group was not a problem "). When implementing the project, students generally proceeded according to the routines they learned in their studies ("first we did a bit of literature research"; "for coming up with the first ideas for the marketing concept we met and worked with the material from the marketing course – so it was really useful that I specialized in marketing for my bachelors as well as for my masters degree").

The social aspect of the projects emerged only marginally in the first discussion and was quickly overshadowed by other considerations ("only people who live below the poverty line are allowed to go there [...] but this is more than € 1.000, - [...] I am sure there are people who live on others"). The social organizations were strongly discussed in another aspect. Students criticized the lack of economic approach of these organizations, which were visible to the students during their respective projects ("they still have 1.7 tons of oranges in stock, they are not selling anything and have already re-ordered 3

tons and do not even have room in the cooling chamber" ; "we were told that the price was just fixed, it is far too high and this has certainly not been calculated"; "the [organization] will start in a month with this new measure, and they still do not know what products they actually offer, not to mention any calculation").

Classification of the findings

The two case studies are embedded in different contexts, but the design of service learning courses and study structure are basically similar, which is why similarities and differences between undergraduate (Case Study 1) and graduate (Case Study 2) students can be identified.

The findings in Case Study 1 revealed that service-learning students expect a higher learning success than students in traditional instructional-based courses. One reason for this perception is the relevance of practical application of knowledge in real-life situations and less the community link to give support to charity organizations. Furthermore, it can be shown that the service activity and the membership in a group respectively have an influence of expected learning success and expected self-efficacy. Like in Case Study 1, the findings in Case Study 2 show that service-learning students expect a higher learning success than students in the course with the problem-based design. Furthermore, the service-learning students assess the impact of the course on their self-image higher. The access of students to the projects is strongly influenced in both case studies by a business background and the emphasis on the social aspect in the reflection and is, therefore, of great value. In Case Study 1, differences exist in the assessment of students with regard to self-efficacy depending on the service activity in which they worked. The qualitative analysis showed that the expected self-efficacy corresponds to perceived challenges in the service process and learning process. This effect does not occur in Case Study 2. It can be assumed that the graduate students already have more experience with projects and also the older age suggests that they do approach the projects more elaborately which is reflected inter alia in the results of the interview data.

Both case studies show that the service-learning students have a higher perception of their learning success than students in traditional courses. This result is also reflected in ex-post observations in other studies (Yorio & Ye 2012, Reinders 2010, Peters el al. 2006). The expectation of the concept of service-learning thus appears to be higher. Here the aspect of the positive expectations transformed into a concrete learning success becomes significantly important. Beyond, Case Study 2 (graduate students) revealed that the service-learning students have a more pronounced self-concept in terms of the module or the course as compared to students in the control group.

From the point of view of teaching design in service-learning courses, first indications can be presented on the basis of the results. First, the preparation of the specific service activity has an impact on the expected effect of the students. It also shows that the students need support in the service-learning process and in the learning-process (which is shown in the results of the qualitative data). From a teaching perspective these results are indications that in service learning-courses the connection between service-process and learning-process is guided by the lecturers. Furthermore, the communication processes among the charity organizations, the students, and the teachers need to be coordinated coherently. Therefore the specific problem definition and curricular content used by the students need to be looked at (e.g. Prentice & Robinson 2010). In these communication processes the students' learning process must be taken into account as well as the learning of the social organizations.

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This provides not only a learning opportunity to the organizations but also the special viewpoint that students, especially in the field of economic subjects, have on their organization and their projects.

A restriction though is that the case studies results were based on self-reports of the students. Both case studies were carried out in the context of business faculties; therefore, the question remains open whether these results can be transferred to other contexts. Finally, the kinds of conclusions you can draw from an ex-ante analysis are limited. The ex-ante analysis provides some questions for future research. On the one hand, the differences between undergraduates and graduates students while using a service-learning approach need to be analyzed. On the other hand, it seems relevant to adapt the methodical instruments more on the context of service learning. It was shown that the perceived self-efficacy corresponds to both the service process and learning process. Therefore, the scales for measuring self-efficacy should be adapted to these constructs.

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