Real World Projects with Companies Supporting Competence Development in Higher Education

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Abstract

The department of business administration of Münster University of Applied Sciences (MUAS) in Germany has a long tradition in realising practice-oriented research projects in cooperation with industry. The objective of these cooperative projects is to offer students real-life experiences and to make the theoretical know-how of university lectures more tangible by using it in an actual business case setting. Students are given responsibility for project deliveries fitting the expectations of real companies in their real business. Through the projects students are encouraged to develop individual learning and problem solving competencies.

In this paper, four good practice examples for university-industry cooperation integrated in the education of students in the field of marketing, specifically market analysis, will be presented. The project descriptions will highlight the different methodological approaches, focusing on their specific innovative features.

The paper will evaluate the competencies students gain during their involvement in those kind of projects. To follow a valid scientific approach, the competence matrix of Erpenbeck & Heyse will be presented and used to highlight the specific competences gained by the students working on those projects.

Keywords: University-industry cooperation, Problem-based learning, Marketing education, Collaborative education projects, Student competencies.

1. Changes in the parameters of higher education

Over the last decades the parameters of higher education have undergone several major changes − not only in Germany. The globalisation of the economy, the shift from a manufacturing-based to an information-based society, as well as the development of new media and communication technologies have led to significant changes in the workplace and the conditions of work (Kennedy, Lawton, & Walker, 2001). Globalization has led to a continuous increase of the global-wide network density, and as a result of this the speed and intensity of change as well as the complexity in the system 'earth' have risen. Such developments, combined with the emergence of the knowledge society, contribute to a new paradigm of knowledge production in higher education (Moravec, 2008). "Society at large is re-evaluating the types of skills and competencies that graduates need to possess in order to be adequately prepared for work and life in the knowledge age" (Tynan & Lee 2009, p 98). Universities have to respond to these changes (Tynan, Lee, & Barnes, 2008).

The requirements of the market and employers towards graduates of higher education have changed dramatically. In the past, it was mainly the professional expertise that decided on the success of a job application, but today's personnel managers attach great importance to the strategic competences of the candidates such as problem solving, creativity, presentation techniques, decisiveness and interpersonal communication ability (Baaken, 2002). Besides, there is a growing need for "multi-skilled workers" who are able to adapt quickly to changing skills demands and new methods of work organisation (Mansfield, 2004).

A study of the Chartered Institute of Personnel and Development (CIPD) revealed more than half of the businesses based in the UK use 'competency-based interviews' (Robinson, Sparrow, Clegg, & Birdi, 2007). According to Fleit (2013), half of the performance of a successful marketing manager is defined by the competencies, followed by motivation and experience. "Job skills and experience combined have less impact on success than having the right set of competencies" (Fleit, 2013). Given the importance attributed to competences in business, there is a wide agreement

to align university curricula to the needs of society and the labour market. (Mulder, Gulikers, Biemans, & Wesselink, 2009)

Many authors discuss the concept of competence (Azemikhah, 2006; Mansfield, 2004) or even the competency era "that replaced the contents era" (Drexel, 2003). Within higher and vocational education the focus has changed from the content of the courses to the conveyance of competencies and skills that allow students to adapt easily to new demands and tasks.

Teaching has developed from a mainly teacher-oriented lecture activity with students being more or less passive learners, to a more student-oriented activity where students are encouraged to be active in the process or experience of learning (Kennedy et al., 2001). Barr and Tagg (1995) postulated in their highly discussed and recognized article "From Teaching to Learning – *A New Paradigm for Undergraduate Education"* that colleges no longer are institutions that exist to provide instruction, but institutions that exist to produce learning. They argue that higher education institutions should offer a creative environment that enables students to develop individual learning competencies and strategies to acquire and construct new knowledge by themselves.

The European Qualifications Framework (EQF) provides a 'competence framework' for the European Union with general descriptors for learning outcomes (Brockmann, Clarke, & Winch, 2009). Competence is defined by the EQF as "the proven ability to use knowledge, skills and personal, social and/or methodological abilities, in work or study situations and in professional and personal development. In the context of the European Qualifications Framework, competence is described in terms of responsibility and autonomy." (European Qualifications Framework, 2014). However, despite such frameworks like the EQF there is still no consensus for using a common competence definition or model (Winterton, 2009). While the English National Qualification framework works with a narrow concept of competences based on work activities and task-based skills, in French, Dutch and German systems the conception of competence denotes a more broadly defined occupational capacity (Brockmann et al., 2009). Winterton (2009) and Le Deist (2009) give a detailed view on the relationship between the competence typologies in different European countries.

Our starting point has been the competence concept of Erpenbeck and Heyse, which relates to the German understanding of competence. Competences are defined as abilities for self-organization of acting and thinking – in particular in changing situations and as ability to conform in a comprehensive sense. Erpenbeck and Heyse structure the competences into four basic areas: (P) Personal Competence, (A) Activity and Action Competence, (M) Methods and Professional Competence and (S) Socio-Communicative Competence (Heyse & Erpenbeck 2009).

In higher education, competence profiles are generically composed for different levels of mastery (e.g. BSc, MSc level); in the German qualification framework also certain key competences have been emphasized (Heyse, 2014). The Association of German Chambers of Industry and Commerce has published insights on the competences that companies want graduates to possess most (DIHK, 2011). However, all those frameworks and studies have in common that they provide information on required competences across all industries and functional areas. Since marketing graduates of Münster University of Applied Sciences are asked to possess function-specific competences a focused analysis of labour market offerings has been executed. Based on the recommendations of Mulder et al. (2009) the way to get to a competence profile was to start with job descriptions and extract competencies for jobs. As a result a competence heat map for marketing graduates has been generated as shown in figure 1. Out of 64 strategic competences 16 have been identified as being of particular importance.

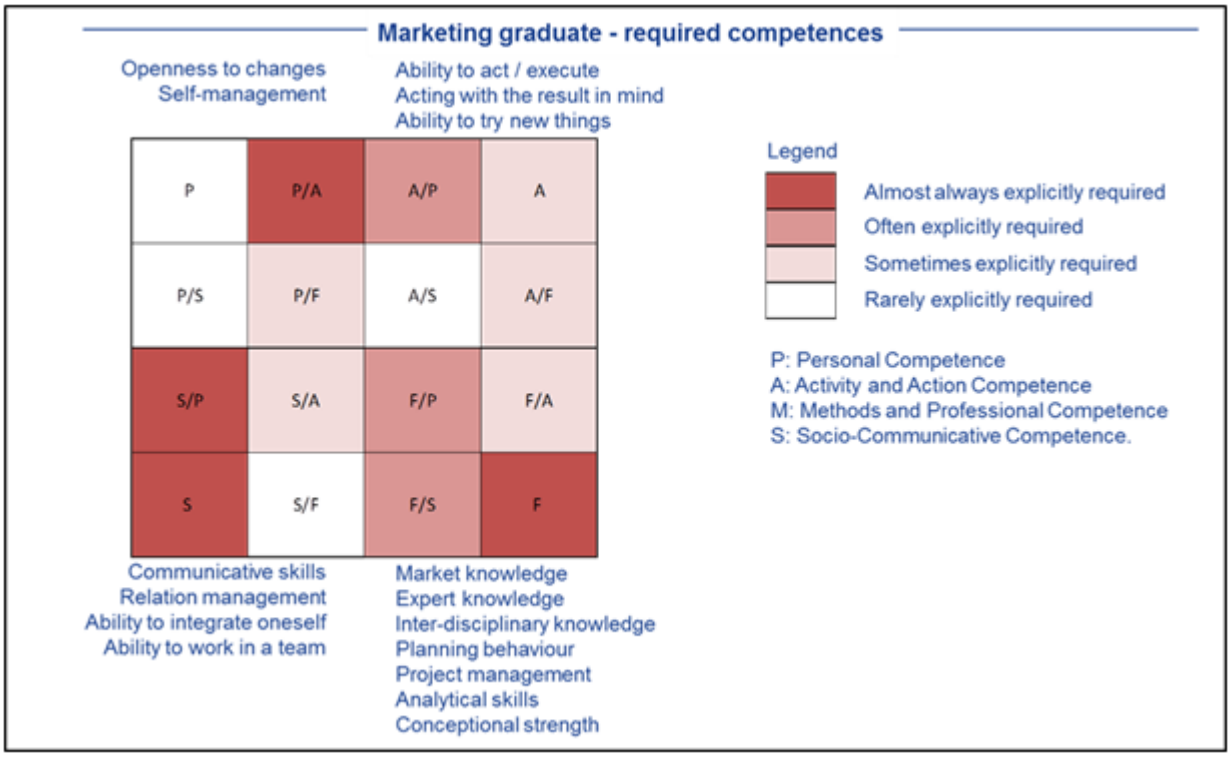

Figure 1. Desired competences of a marketing graduate

Following the assessment of Wildt (2004), who asks for a change of learning culture from all stakeholders, new didactic concepts were put in place at Münster University of Applied Sciences to align teaching and competence development (Öhlschlegel-Haubrock, Rach, & Wolf 2014). New pedagogical theories have found their way into university didactic, e.g. the concept of 'learning by teaching' which is based on the idea that students are much more motivated to learn when they are given the opportunity to act as teachers themselves and to teach their fellow students the learning-matters of the course (Skinner, 1994; Grzega, 2003; Grzega & Schöner, 2008; Cortese, 2005; Eddy, 2006). 'Learning by Teaching' also offers students the opportunity to practice and develop competences because it "encourages and demands creativity, independence, self-confidence and fundamental key qualifications (i.e. the ability to work in a team, complex thinking, the competence to seek and find information, explorative behaviour, presentation skills, project competence, internet competence, generating knowledge as well as disciplinary virtues like punctuality, reliability, patience)" (Grzega 2005, p. 2). Innovative teaching methods that allow students to be more active within their learning process are also much more effective regarding the percentage of knowledge that is actually memorised (Baaken, 2002). Explaining the learning-matters to others was proven to be the most effective procedure of the innovative teaching method – corresponding to the above described 'Learning by Teaching'.

Another factor that exerts a strong influence on the academic education is the increasing competition between the different institutions of higher education. In order to attract the most talented students, universities are challenged to offer ambitious, diversified and innovative teaching methods (Lim & Svensson, 2007).

1.1 Special features of industry projects as part of marketing education

One way to confront these challenges of the changing parameters in higher education is to develop new and innovative education tools that give students the opportunity to shape their learning strategies in a more self-determined way. A good example of an innovative educational tool is the realisation of collaborative industry projects within university seminars where external industrial clients pay for research projects that are conducted by students. This experimental learning approach gives students the chance to intensify the learning of theoretical concepts by gaining practical experience in applying these concepts to actual research problems. These collaborative industry projects, also called life-case studies, are sometimes successfully used in the area of business administration, e.g. in marketing research courses (Kennedy et al., 2001). They offer substantial pedagogical advantages compared to the traditionally used theoretical case-studies as students can make valuable educational experiences that are difficult to incorporate into the class by traditional teaching methods. Humphreys (1981) lists the following three advantages: First, the students have

to identify and formulate a specific research problem based on the information they are given by the client. Second, the students have to decide on the appropriate information sources and data collection/analysis methods, and third they have to develop a specific research proposal to meet not only the client's needs and cost constraints but also the time constraints of the class schedule. Kennedy et al. (2001) argue that live business cases are very powerful learning tools because they provide an "open-ended environment" that fosters the development of critical thinking and problem-solving skills" (Kennedy et al., 2001, p.147). Besides, most of the collaborative industry projects are conducted in student teams give students the opportunity to develop their team ability and their interpersonal skills. This is an important outcome given the changed requirements of employers towards the graduates of higher education mentioned before (Kennedy et al., 2001). Team projects offer in general many pedagogical benefits such as higher motivation of the students, multicultural experiences, positive peer modelling, cooperative learning, as well as the development of essential workplace skills including communication, group interaction and technical skills (Williams, Beard, & Rymer, 1991; Boentert, 2013).

Of course, there are also problems that can occur in projects realised with student teams. One is the dilemma that team members might contribute unequally to accomplish the workload (Williams et al., 1991).There are several reasons why one or more students might not contribute fully to the project, from the simple desire to avoid effort and responsibility to more complex reasons such as lack of self-confidence and/or the bowing to very dominant personalities within the group (Williams et al., 1991). Either way, the consequences of inequitable contributions in group projects are negative as some students may learn less than what they would learn with individual assignments. Others might feel overstretched and might also reduce their effort because they fear that the grading system will not reward their contribution in a commensurate way. "In the worst instances, the group is unable to complete its task, and the instructor must deal with distraught students, anxious about how to proceed, fearful of grading consequences, angry about their teammates' failure to perform assigned tasks" (Williams, Beard, Rymer 1991, p. 49). Williams et al. (1991) suggest different solutions to cope with the so-called 'free-rider-effect' within student groups. The most important key principle is the use of an appropriate award structure that also allows an individual accountability for each student. For example the instructor might sum up the individual scores of the students to get a group score which then builds the basis for the team grade. Other methods could be the use of peer evaluation forms, instructor observations, working papers, meeting reports, interaction logs or confidential reports to ensure the individual accountability (Williams et al., 1991).

2. Marketing education at Münster University of Applied Sciences

The realisation of practice-oriented research projects in cooperation with industry is a priority within the department of business administration at Münster University of Applied Sciences. Especially, the education of marketing and marketing research is supported by the integration of industry projects (Baaken & Gosejohann, 2009). The objective of these cooperative projects is to offer the students real-life experiences and to make the theoretical know-how of the university lectures more tangible by using it in actual business case settings. Besides, the students are encouraged to actively organise and structure their learning process and to train − next to the study of marketing knowledge − also soft skills such as complex thinking, problem solving capacity, presentation techniques, interpersonal communication competence and team ability. Since to a large extend the students self-organize their projects a 'learning by teaching' environment is facilitated. Students occupy project leader, group leader and task leader roles and are asked to teach applied methods and achieved results to the team. Opposed to traditional student assessment techniques, the term grades of the marketing students at Münster University of Applied Sciences are based by two-thirds on project work, case studies or seminar papers and only by one-third on written exams. This system is applied, because the self determination of the students is regarded as a key factor of study success at Münster University of Applied Sciences.

Each semester a number of practice-oriented research projects are conducted as part of the marketing education at Münster University of Applied Sciences. According to statements of partners companies, they are most interested in running those kind of projects with universities as the projects provide very good 'value for money'. For example, they receive new insights and solutions to their very specific problems and get to know graduates which might become employees of their company in the future.

The general setup of these kind of projects can be summarised as follows. At the semester start the students are allocated to the projects. Depending on the amount of the expected workload and the interests of students, around 10 to 20 students are joining each project. In week 2 delegates of each partner company are handing out the briefing and task. This can be seen as a kick-off workshop. All kinds of questions are welcome. Week 3 is used for an internal discussion and development of a first project design to address the requirements and questions of the company. A re-briefing will

take place (physically or via Skype) to make sure all stakeholders (students, lecturers and company representatives) have the same understanding of the problem and get approval for the methodology which is part of the project design.

In the following weeks the project is executed: questionnaires are developed, basic groups defined and organised, samples drawn, fieldwork done, data analysis conducted, recommendations developed and a report created. This period lasts approximately 10 weeks. Small groups of students work on parts of the project (work packages). Every week the entire group meets in a plenary session to present in between results of their sub-groups. Every plenary session minutes are written and the minutes (using a template provided by the lecturer) are sent to the partner company on the following day. By this procedure the project partner is constantly involved in the process, informed what happens in the project and has the opportunity to interfere in the project by providing additional background information, contributing to a discussion or adjusting a decision.

After having finished the final report, the entire group will travel to the company's premises and present the results to delegates of the company. Being onsite, a number of participants from the company are able to join in and the students are put into a professional environment outside of the university, e.g. the board room of the company. Every student is delivering a part of the presentation and questions are answered by the group members, not only by the actual presenter.

Students will get a qualified certificate, which is describing the projects in its key elements and assessing the groups' performance level. The certificate is printed on the company's letterhead and signed by responsible managers of the company so that the certificate helps graduates in their application process for a job.

The budget for the project is provided by the company with costs being around 10.000€ per project. The income is part of the university's third party money stream and is partly spend on project research issues (database, field work etc.), and partly used for buying general equipment for the university (computers, publications, etc.). The project activities range from addressing potential clients, communicating with the client including transparent communication of the project's progress, developing and implementing an appropriate research strategy, and presenting the results to the client.

In the following, four examples for university-industry cooperation in the education of marketing students will be described, focusing on the specific features of the projects.

Table 1. Description of the projects with company 1 and 2

	Company 1	Company 2
Company's business	The company is a "Hidden Champion" and one of the world's leading producers of industrial drying plants including the related conveyor and handling systems and filter and de-dusting concepts. 220 employees create a turnover of some 50 Mio. Euro. The proportion of in-house production thereby is 80%.	The company is a leading chemical company. With business segments in chemicals, performance products, functional materials & solutions, agricultural solution and oil & gas. The company creates chemistry for a sustainable future. Subsidiaries are situated in more than 80 countries and products are supplied to almost every part of the world.
Project team	17 students of the **Master** course in International Management, plus 10 students from Cracow University of Economics had been involved as part of an exchange programme.	The project team consisted of 13 **Bachelor** students from six different countries, attending the course International Marketing at Münster University of Applied Sciences.
Situation	The company has a client base in most European and Asian countries. The American market is lacking so far but seems to have a big potential for the company's products and services. The project aimed at recommending a targeted market entry strategy for the northern American markets: USA, Canada and Mexico.	The company was interested in entering a new market with a new and innovative special coating system. Initially this market and its players had to be explored and the potential for the company to enter the market had to be examined.

Project objective	Development of a list of criteria for selecting the right market entry strategy, covering the number of potential clients, the number of competitors, market dynamics (growth, M&A activities), location, costs, planed constructors, environment factor, taking into accounts the core competences of the company for the four target sectors glass wool, carbon fibre, catalysts and ceramics.	The objective was to identify technologies and coating products used by potential customers and competitors in Europe, Asia and North America. The results were expected not only on anabstract level, but also contact details of companies and decision makers had to be researched.
Methodology	Desk research: Journals, books, internet, fair catalogues; business research and consulting firm reports; Use of one week free account of Frost & Sullivan database, secondary data for industry sectors. Primary research: Telephone interviews (100 phone calls with key people from client organizations and with relevant representatives of industries and federations).	To get an overview about the market, the project team collected relevant information about products and technological processes. This basic knowledge supported the following internet research for companies performing or acting in the target markets, Europe or North America. The project team created a database containing personalized contact information of 221 company contacts. Together with the company, a survey was created to gather relevant information about the market potential for the company. The survey was sent out along with a personalized cover letter via e-mail and a telephone survey in a second wave. Thanks to a return rate of 21% relevant data could be analysed and presented to the company. The project team was able to give recommendation on the market entry.
Results and deliveries	• Relevant background data and information to all target markets in the 3 countries, • future trends, • a range of different market entry options related to the markets, • a set of best practices and examples from German companies being successful and having failed in the US market, • a recommended strategy, • a list of detailed activities to follow the strategy, • a portfolio setting priorities, including contact details of people to approach.	The project provided the client information on: • the business potential of innovative solutions, • customer requirements, • concrete customer options, • personalised contacts, and • recommendations for new business development.

Table. 2. Description of the projects with company 3 and 4

	Company 3	Company 4
Company's business	The company offers PE material pipes and piping systems (water supply, gas supply, disposal, industry irrigation, geothermal energy, telecommunications / cable protection) worldwide, and is strong in research & development, advisory and consulting services and high end quality. The company's image is based on innovative production processes developed within the company. Turnover around 110 Mio €, 150 employees, export 46,2%.	The company is an IT management consultancy and performs projects with complex and international IT providers, focusing on the finance and ICT sectors. The company offers definition, optimization and implementation of management and ICT processes. Around 90 employees.
Project team	17 students of the **Master** course in International Marketing & Sales at Münster University of Applied Sciences.	The project team consisted of 16 **Bachelor** students (from 9 different countries), attending the course Strategic Marketing at Münster University of Applied Sciences.
Situation	The company aimed to make use of new market opportunities with regard to water, gas and sewage pipes in megacities around the globe. The company wanted to know which megacities bear the most attractive business opportunities.	The company was performing different marketing and communication activities. Initially it was unclear which of those were contributing to the brand value of the company and how much the brand value was estimated to be at all. A targeted marketing and communication agenda should meet the target of a structured brand value extension.
Project objective	Analysis of megacities. The student group was expected to collect detailed information (focusing on both primary and secondary research), select and create profiles of megacities (in both developed and emerging countries) with high potential and develop guidelines on how to exploit the business opportunities in these cities. The project sub-tasks were defined as follows: • Development of a criteria catalogue for assessing megacities and their potential • Classification and evaluation of megacities • Detailed documentation on each selected megacity • Guidelines for future approach for each selected city	After years of experience in the market, customer relationships and publicity, the company was interested in its perceived performance and image. For internal communication aspects, it was also relevant how the company's employees perceived the same items.

Methodology	The project started with basic desk research leading to the pre-selection of megacities. The students developed a criteria catalogue for evaluating megacities by using a spider matrix. The results of this evaluation lead to a focus on eleven megacities (five in developed, six in emerging countries). Subsequently the students created detailed profiles of the selected megacities. They identified key stakeholders, authorities, organisations and contact persons in charge of pipe systems and valuable information about the infrastructure-related activities in each city. Additional information were collected, e.g. regional studies and fair announcements.	The students identified drivers for brand value and marketing success in literature and theories. The company's performance concerning these drivers was then quantified by an empirical survey with responses of customers, non-customers and employees. The combination lead to a bundle of internal and external marketing and business recommendations.
Results and deliveries	The student group elaborated detailed profiles of megacities and specific guidelines as a basis for the company's potential market entry.	The different stakeholder groups (customers, non-customers, employees) provided detailed information on the company's performance and brand image. As final result, the brand value of the company has been calculated in an interval of Euro.

For structuring the projects and developing appropriate solution concepts, methods and professional competence is required. For the daily execution of work within the projects' social-communicative competence' and 'activity and action oriented competence' are required and 'personal competence' is particularly demanded in leading roles. Overall, the project set-up of the teaching modules supports well the development of the previously identified competences. A more detailed view on 'Which particular project has supported which competence in focus?' is highlighted in the following table 3.

Table 3. Summary - by the projects supported development of identified competences

Area of competence	Competence	Company 1	Company 2	Company 3	Company 4
Personal Competence	Openness to changes	✓	✓	✓	
	Self-management	✓	✓	✓	✓
Activity and Action Competence	Ability to act / execute	✓	✓	✓	✓
	Acting with the result in mind	✓	✓	✓	✓
	Ability to try new things	✓	✓	✓	
Methods and Professional Competence	Market knowledge	✓	✓	✓	
	Expert knowledge	✓	✓	✓	
	Inter-disciplinary knowledge	✓		✓	
	Planning behavior	✓	✓	✓	✓
	Project management	✓	✓	✓	✓
	Analytical skills	✓	✓	✓	✓
	Conceptional strength	✓	✓	✓	
Socio-Communicative Competence.	Communicative skills	✓	✓	✓	✓
	Relation management	✓	✓	✓	✓
	Ability to integrate oneself	✓	✓	✓	✓
	Ability to work in a team	✓	✓	✓	✓

3. Conclusion

The description of the cooperative industry projects makes clear that the usage of actual business cases is a very effective pedagogical tool (not only) in marketing education. The participating students had the opportunity to develop competences that had been identified as being of key importance for their professional life.

In all four projects, the project team members trained a whole set of different competences that are required in today's workplaces. The students had to deal with the individualities of their team mates and therefore had the opportunity to train their communication, relationship and team ability. By developing a concept for the project, self-managing the project and developing knowledge about complex markets in a short time-frame the students fostered their 'methods

and professional competence' as well as their 'personal competence'. In addition, analytical skills were intensively trained in all four projects as the students were confronted with a research question of the client and had to find suitable research methods and strategies to find answers to this question.

The time pressure as well as the pressure of giving a concise presentation of the results to the clients attributed to a temporal emotional debilitation of the students, a necessity in order to permit training of such competences. Particularly the time pressure also created a frame for the development of 'activity and action competence'. The lecturers provided coaching assistance and regular feedback to permit self-reflection. As most projects were conducted on an international level, the students also acquired know-how on global markets and international business relations.

Generally, it can be concluded that student projects that are realised in cooperation with industry represent an effective 'learning by teaching' scheme that offers students a creative learning environment and the opportunity to develop individual learning strategies as well as comprehensive competences of different kind.

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