



A field study examining success factors of university-school-collaboration

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Abstract

With decreasing numbers of students pursuing a career in science (OECD, 2008), the call for educational reforms building a basis for an interest in science is great. Cooperation between schools and universities are an important aspect of these reforms, as they aim at sparking an interest in science (Robert Bosch Foundation, 2005). The Ministry of Education of North-Rhine Westphalia has also made these collaborations a mandatory part of the professional development of young students in Germany.

In order to determine the connection between the success factors *diversity of the human resources, financing, public relations work*, as well as *evaluation* and the actual success of such projects, a questionnaire with 26 items, including open questions, was developed for a quantitative approach to the topic. The survey was mailed to 119 institutions, schools and universities, in Germany to find out about active cooperation.

Out of the 119 institutions asked to take part in the survey, only eight were willing to do so. Therefore, the results are of an exploratory nature and can only indicate certain tendencies.

The results reveal that the involvement of teachers and teacher trainees seems to be important for pedagogical exchange. Financing was mainly realized through external funding and not through the state. There was also a call for improvement in terms of money available for the projects. Public relations activities as well as regular evaluation led to higher public recognition. Consistent evaluation is also seen as a crucial factor for the development and improvement of collaborative projects.

Keywords: University- school transition, collaboration, success

Introduction

The lack of qualified science specialists goes hand in hand with decreasing numbers of science degrees (Robert Bosch Foundation, 2005). When the "PISA shock" of 2000 revealed devastating results for science and mathematics, educational reforms were started in Germany to improve the basis for science education in school. However, PISA scores are still stagnating in the relevant areas (Hesse, 2013). The interest in the promotion of science is not only an issue in Germany, as "the evolution of student enrollments in science at various levels of the education system has been an issue of considerable interest in many OECD countries over recent years" (OECD, 2008, p. 3). This is especially relevant since the "economy [is] increasingly dependent on complex knowledge and advanced cognitive skills" (ibid).

Collaboration between schools and universities has gained considerable importance in reform efforts (Borthwick et al., 2003, p. 1). The goals of such initiatives are sparking interest in sciences and the principles of science, trying out new methods of science education, as well as opening doors for a direct access to science and science studies (Robert Bosch Foundation, 2005). It becomes clear that

there is a “focus on learning” for all parties involved, and “new learning relationships” can be established (Kruger et al., 2009, p. 10), as a crossing of school and university boundaries takes place (ibid.).

In North Rhine Westphalia these reform efforts led to a decree of the *Ministry of Education* for the career choices in school. A large part of this reform is the cooperation between schools and universities: Universities have to provide information about their courses of study, open up for internships, trial days, and other projects. The schools’ task, on the other hand, is to provide their pupils with information about these offers, so that new learning locations apart from school are created. The collaboration is an important aspect of the career choices on the part of the pupils, which also have high social and economic relevance (Learning Region, Network Cologne, 2013).

This paper seeks to analyze how the success of collaboration between schools and universities is connected to the previously specified success factors: *diversity of the human resources, financing, public relations, and evaluation*.

For the study, a questionnaire was developed which contained 26 items concerning the success factors mentioned above, as well as open questions regarding the personal judgment of factors determining success on the part of the participants. It was assumed that the more groups of persons are involved in such a project, the better the financing is, the more public relations activities are done, and the more frequently a project is evaluated would lead to increased participation, improved long term existence, and public recognition through prizes and awards.

Of the 119 institutions contacted, only eight were willing to take part in the survey. Thus using a qualitative approach was more reasonable, which means the results for each of the institutions are described in greater detail. The individual projects will be introduced, to illustrate some concepts of university and school partnerships in Germany.

Collaboration and Success Factors

The most crucial characteristic of collaboration is the interaction among individuals which creates one product in the end. It is a “mutually beneficial and well-defined relationship entered by two or more organizations to achieve common goals” (Mattessich, Monsey, 1992, p. 11). It differs from cooperation, since here each participant is responsible for a part of problem solving. It involves a “task that is accomplished by dividing it among participants” (Teasley, 1995, cited in Kozar, 2010, p. 2).

Empirical research on business management success has identified a number of aspects that seem to be important. The number of these varies from 30 to 100 and appears to be not clearly defined in literature (Lechler, 1997). The field of success factors in business however is a debatable research topic due to the complexity and causality of success. Additionally, the literature rarely mentions success factors, as they are project specific and change over time (Tjaden, 2003). Yet, Rockard (1979) identified critical factors, which are “strategic factors in business success” (cited in Tjaden, 2003, p. 62). The factors can be divided into factors related to persons, environment, and company (Tjaden, 2003). Lechler (1997) extends these areas to participants, which are persons, groups, or organizations, functions, which are task-oriented actions on the part of persons involved, such as planning, leading, coordinating, and instruments, which include external influencing factors.

The *Robert Bosch Foundation* names several recommendations for the stabilization of projects between schools and universities (2005). These recommendations were used as a basis for developing the four success factors used in the study.

1. The **establishment of diverse transitions**, especially support programs which help students with their choice of their course of study. They are essential to prepare and inform students about what to expect from university life.
2. Moving project work **away from marginality**, which is mainly caused by difficult political circumstances in Germany, as different ministries are responsible for schools and universities.
3. **Communication** between institutions involved.
4. A **high diversity** of people involved in a project: University employees have the know-how needed, university students are able to empathize with students from school, teachers serve a pedagogical purpose, and a larger number of faculties involved is useful for a wider range of knowledge.
5. **Permanent financing** through public funds or other sources.
6. **PR work** underlines the relevance of projects and their goals, it can spark interest in the project.
7. The quality of a project can only be maintained through **regular evaluation**. Successful projects can be expanded, weaknesses can be identified and improved, especially through feedback from persons involved, such as teachers, lecturers, students.

The following table provides an insight into the four categories of success which were used for the study. A short definition of each factor is given, as well as its function within a collaborative project.

Table 1. The four success factors used for the study, their definition, and function for the projects.

Success factor	Definition	Function
Diversity of the human resources	The diversity of persons involved in the project variety of knowledge and skills of individual persons involved are an essential part of the quality of the project	Higher attainment of the profitability of a collaborative project
Financing	All measures for the acquisition of funding for maintaining the project financing of a project can be permanent but also temporary	Requirement for the realization of a collaborative project
Public relations	Planned organization of the relationship between the project and the public (parts of the public) Through radio, TV- shows, articles in newspapers or on the internet, posters,	Advertisement for a project improvement of image

Evaluation	flyers Evaluation, assessment, and analysis of a project	Assuring the quality of a collaborative project
	through standardized and non standardized questionnaires, interviews or other methods for analysis	

For the study, eight categories of projects were divided into eight categories with the help of theoretical foundations based on Ley (2010) and the Robert Bosch Foundation for classifying existing initiatives between universities and schools:

Methodology

The aim of the study was to investigate the four influential factors *diversity of the human resources, financing, public relations activities*, as well as *evaluation* in connection with the success of cooperation between schools and universities in Germany.

The underlying question to be evaluated was to what extent the personnel structure, a reliable and sufficient financing, an active public advertisement and regular evaluation determine the success and interest in a collaborative project. The following hypotheses were generated in order to investigate the link between the influential factors and the success of a particular project.

H₁: "The more groups of persons are involved in a project, the more successful it is."

H₂: "If the financing is permanent, a collaborative project will be successful, and the more investors are involved, the more successful it is."

H₃: "The more public relations activities are used by a collaborative project, the more successful it is."

H₄: "The more frequent a collaborative project is evaluated, the more successful it is."

The success of the project was measured on the basis of pupils wanting to participate in the project and its capacity to accommodate them, its long term existence, and public recognition through prizes and awards. In addition to this, participants were asked to indicate which criteria they think are essential for the success of a collaborative project. These open questions were used to compare thoughts and theory.

For the empirical study, a questionnaire consisting of two parts was developed, the first of these was used to gather general information about the institutions involved in order to get an overview of existing projects between schools and universities. The second part of the questionnaire was designed to find out about the particular project, its concept, and the success factors in detail. The second part consisted of six categories of questions which are shown in table 2. In total, 26 questions were used in the questionnaire.

Table 2. Overview of question categories in the questionnaire

Category	Type of question
I	Introductory questions
II	Questions regarding the concept
III	Questions regarding practice
IV	Questions regarding evaluation
V	Questions regarding personal judgment
VI	Questions regarding public relations

The first part of the questionnaire includes questions about the name of the project, the number of institutions involved, the category the cooperation belonged to (see table 2), and the relationship between supply and demand. Other questions deal with the number of groups of persons involved, the duration of the project (permanent or temporary), the use of media in the project, and its financing. If a project is carried out permanently and financed through (external) funds, this could indicate its success. Block IV partly consists of five open questions included in order to investigate the participants' personal judgment of factors responsible for the success of the project :

"In your opinion, what are success factors of a collaboration between schools and universities?"

"According to what kind of criteria or characteristics do you judge the success or failure of your project?"

"What kind of changes have to be realized in order to improve the cooperation between schools and universities?"

"What kind of changes are you planning to implement in your project?"

"Where do you see problems concerning the cooperation between your school/university and other schools/universities?"

This part also contains questions about whether the project was evaluated, and if yes, how often, since regular evaluations are essential for improving an existing cooperation.

The last set of questions is concerned with the project's public relations work. The questions were asked to find out what kinds of PR activities were used and whether there was public recognition of the project through prizes and/or awards. The wider the range of activities used for PR, the more interest is evoked among the public. It was assumed that public recognition is a sign of a project's success.

The starting point of the survey were the universities. The questionnaires were directly sent to them in order to get an overview of initiatives currently carried out. The universities were then asked to distribute the questionnaire to their partners in an attached letter. As it was expected that not all universities would do as asked of them, questionnaires were also directly sent to schools. The resulting overlap of institutions involved in the same project made it possible to compare answers and findings. All institutions were asked to participate in the survey via mail. Since it was not possible to directly contact the projects, the press offices of the universities and schools were contacted and asked

to distribute the survey to the persons involved in specific projects. A total of 119 institutions was asked to take part in the survey.

Results

Since only eight out of 119 institutions took part in the survey, a qualitative approach to the results was seemed more reasonable, in which the results of the survey will be compared and analyzed in relation to the success factors *diversity of the human resources, financing, public relations, and evaluation*. Since so few institutions participated, it is possible to introduce the programs in more detail for further information. When it comes to the actual success factors, each of the projects that took part in the survey was assigned a number and will be described.

The Programs in Detail

This section gives a brief impression of the projects which took part in the survey. It also assigns each cooperation a category mentioned above.

NaT- Lab is a project of the Johannes Gutenberg- University in Mainz and belongs to category IV (pupil laboratory working groups). Initiated in 2000, it is one of the first projects of its kind in Germany, designed to facilitate science competences, foster talents, promote interest in science studies or science related jobs, as well as improving teacher training. Various projects for different age levels are offered in biology, chemistry, mathematics, physics, computer sciences, and geosciences. In the project, students conduct and discuss experiments or scientific projects with the help of university staff, teacher trainees, and their teachers. Additionally, show lectures are held with interesting experiments for the pupils. Financial support is mainly received from the Robert Bosch Foundation and different sponsors.

The project **teutolab** was also initiated in 2000 in order to improve science education in the areas of biology, chemistry, physics, mathematics, and engineering. Similar to the first project, children can explore their talents and interests in sciences through experiments supervised by trained professionals. **Teutolab** is funded by the ministry of education of North Rhine-Westphalia, further education and research, as well as various foundations and companies.

Kolumbus-kids belongs to category VIII, promoting gifted students and improving teacher training. The pupils meet in small groups once a week at Bielefeld University and deal with biological topics for two hours, conducting experiments and evaluating them.

The initiative **teutolab mathematics** of Bielefeld University aims at sparking enthusiasm for mathematics and belongs to category IV. Pupils taking part in the project work through different stations which cover different areas of mathematics over the course of four hours.

Also belonging to the category *pupil laboratory* is The **Curie working group** of Leibniz University in Hanover also belongs to category IV, pupil laboratory. It aims at improving the relationship between university and school, sparking interest in chemistry, as well as demonstrating the relevance of chemistry for technology, the environment and science. It is designed for older students and chemistry teachers and consists of pupils' events in which whole classes conduct experiments three times a week. Apart from offers for pupils, there is also a chance for chemistry teachers to take part in training.

The so called **Business Academy** is cooperation between the University Bonn-Rhein, Siegen and one specific school, and aims at teaching technical expert knowledge and various key competences. Older students can take part in the project and are divided in groups of up to 25 people. They take part in a six hours course on two Saturdays of the month. When completing successfully, participants receive a

certificate in leadership and management. The courses are taught by lecturers. It is difficult to assign a category, but it could belong to students trying out university (category III), since pupils do the courses while still at school and get credit for them.

The **chemistry working group** is another cooperation between one specific university (Clausthal University of Technology) and a school that belongs to the category *pupil laboratory*. Its aim is similar to the other laboratory projects: improving training in the sciences as well as reducing anxiety when it comes to the transition from school to university. Pupils conduct experiments in the labs of the university and get to know scientific working methods.

wissen schaf(f)t was is a project involving Bielefeld University and three schools, which provides insights into different fields of study, as a preparation for possible studies at university. Highly motivated and talented pupils are chosen by schools and get a chance to hear lectures by professors once a month. The initiative belongs to category VIII, *programs for gifted pupils*. Pupils have to write a term paper in order to complete the course and get a certificate at the end.

Results of the Questionnaire

Project 1

Table 3. Overview of the success factors for project 1.

diversity of the human resources	financing	public relations	evaluation
One faculty involved	Annual financing	Internet, newspaper articles, flyers, posters, word of mouth recommendation	Annual internal evaluation by university and school
Students, teachers (1), student assistants (3), lecturers (2), professors (7)	Funding by foundations, student fees paid by parents	No public acknowledgment	Through questionnaires and tests

For this project, the relation between demand and supply of the project was balanced. Both institutions, school and university, were responsible for managing the project.

The media used in the project were flip charts, overhead projectors, projectors, the internet, the board, software, work sheets implemented in lectures, group work, and discussions.

Student related content, age appropriate teaching methods, avoiding a tight time management as well as a good and reliable project management were named as success factors of collaborative projects. The success of the project was measured on the basis of students' test results, statements by teachers and students, and impressions of teachers gained during the project.

Possible factors that could interfere with the success of the project were insufficient voluntary work on the part of teachers and a high time investment on the part of students.

Project 2**Table 4.** Overview of the success factors for project 2.

diversity of the human resources	financing	Success factor public relations	Success factor evaluation
One faculty involved	Annual financing	Representation through word of mouth recommendation, recommendation through teachers	Internal evaluation by participants of the project
Pupils, teachers (not definable), professors (3)	Funding by university and a marketing board	Recognition through positive feedback through pupils and teachers	Questionnaires for evaluation

For this project, more people wanted to enter the project than there were places. The participants were equipped with knowledge through lectures, discussions, group work, and tours in which flip charts, overhead projectors, projectors, boards, and work sheets were used. Success factors mentioned in response to the open questions were pupils' enthusiasm, and motivation on the part of the teachers. Factors which could be desirable for a better cooperation included more time, money, and personnel. Teacher stress, limitations in terms of time and work load due to holidays or the preparation time before class tests were listed as factors which could reduce the success of the project.

Project 3.**Table 5.** Overview of the success factors for project 3.

diversity of the human resources	financing	public relations	evaluation
One faculty involved	Permanent financing	Representation through internet, flyer, posters, word of mouth recommendation	No evaluation
Pupils (16), teachers (1), technicians of the faculty (1)	Funding by the district	No public acknowledgment	

For project number 3, the interest was higher than the capacity for participants. Both institutions, the school and university, were involved in the management of the project. Group work with posters, the internet, boards, books, and work sheets were used for teaching.

The people involved wished for an improved cooperation through more personnel.

Pupils' better understanding of the subject matter along with an increased interest in the topic and safe laboratory work were mentioned as success factors. Time and financial limitations were named as interfering factors.

Project 4.**Table 6.** Overview of the success factors for project 4.

diversity of the human resources	financing	public relations	evaluation
4 faculties involved	Annual financing	Represented through internet, newspapers, radio, television, posters, flyers, word of mouth recommendation	Annual internal evaluation by the university
Pupils, student assistants, lecturers, professors	Funding by university, foundations, companies	Through prizes and awards	Questionnaires, video analyses, conducting interviews

This project, too, was not able to cope with the number of people wanting to participate and offered fewer places than needed. Only the university was responsible for management. Media used in the project included flip charts, posters, overhead projectors, projectors, boards, video and audio recordings, the internet, software, work sheets, a smart board, living objects, which were used in lectures, discussions, and group work. Factors promoting the success of the project mentioned in the open questions section included universal guidelines for cooperation projects, the contentment of all persons involved, and clearly defined goals. Factors which were said to show the success of the project were recognition, funding, providing scientific data for research and a high interest in the project on the part of potential participants. The project could be improved by gaining more political and financial support and by reducing the workload of teachers, so that they could participate in the project as well. The lack of participation of teachers due to high workload was also named the most important factor which could reduce the success of the project.

Project 5.**Table 7.** Overview of the success factors for project 5.

diversity of the human resources	financing	public relations	Success factor evaluation
One faculty involved	Annual financing	Represented through internet, newspaper, radio, television, posters, flyers, word of mouth recommendation, publications in academic research journals	Internal, semiannual evaluation by participants of the project
Pupils, teachers, student assistants, lecturers, professors	Funding by university and foundations	Public recognition through prizes	Standardized questionnaires

It was stated in the questionnaire that the interest in the project was higher than its capacity. The university professors were responsible for this project.

In single, partner, or group work the participants worked with projectors, boards, software, worksheets, models, and material for experimenting.

The only success criterion named in the open questions was positive feedback from the participants. Improved cooperation could be realized through better equipment and financing. The project was intended to be improved and extended.

Project 6 (1)

Table 8. Overview of the success factors for project 6 (with school 1 involved).

diversity of the human resources	financing	public relations	evaluation
eight faculties involved	No remarks about financing	Represented through newspapers, posters, flyers	Intern through school and participants
Pupils (10), teachers (2), student assistants (2), lecturers (5), professors (4)	Funding by the school	No public recognition	Interviews and observations (not standardized) and theses

For the first school being involved in this project, the interest and capacity were balanced. As there was no evaluation, the open questions were not answered. The media used in lectures, pupil presentations, and workshops of the project were projectors, boards, as well as books. In the open questions section, it was stressed that success factors of a project in general were the quality of the offer itself, the compatibility with the concept of the school involved, and the accurate selection of participants. The satisfaction of the participants, and the quality of the final theses dealing written by university students with aspects of the project were listed as criteria for the success of the school's project.

Project 6 (2)

Table 9. Overview of the success factors for project 6 (with school 2 involved).

diversity of the human resources	financing	public relations	Evaluation
Five faculties involved	Annual financing	Represented through internet, newspaper articles, posters, flyers	No evaluation
Pupils, teachers, student assistants, lecturers, professors	Funding by university	No public recognition	

The second school involved in the same project only took part in it for six months. There was no evaluation of the cooperation or the project, which caused the participants of the survey to leave the open questions unanswered. Like the cooperation with the first school, the relationship between supply and demand was balanced. The university was responsible only for the management of the project. Projectors, boards, work sheets were used as media in lectures, and workshops.

Table 10. Comparative overview of all collaborative projects (CP) involved with regards to the individual criteria for success. For CP 6, two schools were cooperating with the same university.

Criterion	CP 1	CP 2	CP 3	CP 4	CP 5	CP 6	
						(1)	(2)
Number of faculties involved	1	1	1	4	1	8	5
Number of groups of people involved	5	3	3	5	5	5	6
Number of public relations activities	4	2	2	5	7	2	3
Evaluation	Annual	Other	None	Semiannual	Semiannual	Other	None
Financing	annual (external funds: external foundations and pupils' fees)	Annual university and external funds: marketing board)	Permanent (state)	annual (university and external funds: foundations and companies)	annual (university and external funds: foundations)	- (school)	annual (university)
Duration	Permanent	Permanent	Permanent	Permanent	permanent		limited
Supply (s) and demand (d)	s= d	s < d	s < d	s < d	s < d		s= d
Public recognition	None	Appreciation on part of the pupils and teachers	none	Prizes and awards	Prizes		None

The average number of faculties involved in a project was 2.7, with school one being involved in project 6 and it was 2.2 for school two. One faculty working on the project was most frequent. The mean square error of the average value was ± 8.3 (school one), and ± 3.4 (school two), which indicated high variance. This was confirmed by a variation coefficient of 300 % (school one) and 150 % (school two). The highest number of faculties could be found in projects 4 and 6 (4, 8 for school one, 5 for school two).

The average number of groups of people involved was 4.3 (school one) and 4.5 (school two) respectively, with five groups involved being the most frequent. The values showed a dispersion of ± 1.1 for school one in 6, and ± 1.5 for school two. This meant there was a normal variability (25 % for one) and a high one (33 % for two). Projects 2 and 3 had the lowest numbers of persons involved (3).

The average number of public relations activities was 3,7 (school one) and 3,8 (school two). The number of activities which was mentioned the most was 2. A high variability was indicated by a dispersion of ± 4.3 for 1 and ± 3.8 for 2 respectively. The variation coefficient of 116 % (1) and 100%

(2) also showed a high variability of the data. The highest range of PR activities could be found in projects 4 and 5 (5 and 7 activities respectively, the lowest one in projects 2, 3, and 6 (2-3 activities)

Except for 3 and 6, all projects were being evaluated, projects 4 and 5 most frequently (semiannually). The projects were also the ones which received public recognition through awards and prizes. Except for project 6, all projects were permanent. The interest in the project and its capacity were only balanced in projects 1 and 6, all others could not meet the demand.

In the open questions section of the questionnaire, the participants of four projects (2, 3, 4, 5) named reliable and sufficient funding as a factor which promotes cooperation between schools and universities. Persons in charge of projects 1, 5, and 6 (one) stated they would judge the success of their project based on positive feedback on the part of pupils and teachers.

Discussion of Results

This part will now relate the findings of the questionnaire to the hypotheses and examine to what extent the factors are connected to the success of the projects involved.

H₁: "The more groups of persons involved in a project, the more successful it is."

As presented in table 10 comparing all results, the average number of faculties involved in the projects was 2.7. 4.3 groups of persons were involved, but a high distribution of values can be spotted due to small sample size. Projects 2, 4, and 5 are the only ones which fulfill both indicators of success: the supply and demand relation, as well as public interest and reward: The number of people wanting to enter the project was higher than the projects' capacity. Yet, the number of groups and faculties involved was not different from the others. However, these projects include university students besides teachers, and lecturers. Nevertheless the hypothesis cannot be fully confirmed and the factor diversity of the human resources cannot be identified as a factor promoting the success of the projects. The responses to the open questions showed that projects 1, 2, 3, and 4 want to have more personnel, also in connection with reducing the work load of teachers so that they can be involved more directly in the projects. This might be a sign for the importance of pedagogical exchange between teachers at school and those at university for the success of the cooperation.

H₂: "If the financing is permanent, a collaborative project will be successful, and the more investors are involved, the more successful it is."

Except for project 6, all of the initiatives were permanent and financed annually. It is interesting to look at the kinds of financing the programs received. Four out of six were supported by external funds, meaning companies, foundations, or fees paid by parents. This could indicate that universities and schools are not able to finance the projects on their own.

The call for better financial circumstances was also reflected in the answers to the open questions in the questionnaire, as projects 2, 3, 4, and 5 expressed the need for more reliable and generous funding. A correlation between financing of the projects and success indicators is hard to identify, since projects 1, 2, 4, 5 were financed by external actors. Yet, the frequent references to improved financing as a desired change in some programs as well as good financing as a criterion for success illustrate the perceived importance of stable and safe funding for the success of these projects.

H₃: “The more public relations activities are used by a collaborative project, the more successful it is.”

Only those projects which had the highest number of public relations activities (five for project 4, seven for project 5) also received public recognition by means of prizes, so there seems to be a connection between the number of PR activities and the success indicators supply and demand and public recognition. Therefore H₃ is supported by the findings. While the small sample size has to be kept in mind, it can be concluded that PR activities are important for advertisement and sparking interest among the public, but also for getting sponsors. These two projects that showed the most PR activities were also funded by foundations or corporations.

H₄: “The more frequent a collaborative project is evaluated, the more successful it is.”

All projects but 3 and 6 were evaluated by schools or universities, mostly by the participants, with questionnaires being the most typical instrument for evaluation. The answers to the open questions reveal that the success of a projects was often measured based on statements made by teachers and students in an evaluation. There was a positive correlation between the frequency of evaluating and the success indicators supply and demand as well as public recognition for those projects (4 and 5) that were evaluated most frequently. Those projects also planned to extend their program, which leads to the conclusion that consistent evaluation of a project allows the concept to be improved continuously and to respond to students' needs in an optimum way.

Looking at all factors combined, it can be noted that the defined success factors based on theory influence the success of cooperation between universities and schools, yet a definite and significant statement is impossible, due to the small sample size.

The study was able to outline some connections between success indicators, such as interest in the project as well as public recognition through prize, and success factors. A bigger sample size could have been the basis for more reliable findings, since mostly projects 4 and 5 could be used as objects of comparison for the determination of success. Even though 119 institutions were asked to participate, only six actually took part in the study. Possibly a more convincing letter which was distributed to the institutions could have helped to underline the importance of the cooperation between schools and universities when it comes to the transition between the two. As there were no contact persons for the projects themselves, establishing contact with the institutions was difficult as well. This hints at a lack of awareness of the usefulness of such projects.

Most of the projects were managed by the universities, leading to the conclusion that the involvement on the part of the schools is still too small, especially when it comes to pedagogical aspects. Pupils' laboratories could also be established at schools, since the main goal of these projects is not taking care of pupils on the part of universities, but rather working on a successful transition from school to university life. The value of these cooperation needs to be stressed more, as pupils learn from scientists, teacher trainees and have a chance to gain more practical experience, teachers are trained in scientific methods and provide pedagogical knowledge for university staff involved, who again help to provide a next generation of much needed qualified researchers.

For future studies, it would be desirable if more institutions participated. A bigger sample size would make more significant answers regarding the success factors possible. Follow up surveys could consider other factors for the success of such projects. Questions not particularly relevant for determining success, such as the ones concerning the duration of the project or the concept, could be left out.

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