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Manuela Keller-Schneider

Stefan Albisser

JOBS RESEARCH
Evaluation of the Educational Project 'JOBS'

A project to evaluate the effects of the JOBS teaching and learning materials in the educational instruction of JOBS

Report Part I 2015, Version 2018

in cooperation with fellows at the Transilvania University of Braşov

Laura Teodora David

Ana-Maria Cazan

Camelia Truța

and further employees of the JOBS RESEARCH STUDY

Contents

Introduction

The project 'JOBS' in Romania, initiated by the Centre for *International Projects in Education* (IPE) of the Zurich University of Teacher Education (henceforth PH Zurich), encompasses the cooperative development of teaching and learning materials on job orientation and career options for students in their last year of compulsory education (gymnasium) or at the start of their post-compulsory schooling (technical colleges). It also encompasses corresponding professional development for teachers who implement the new cross-curricular lesson sequences for the duration of one scholastic year. The cooperation in this Swiss-Romanian project involves on the one hand the relevant ministries (the Romanian Ministry for Education, Research, Youth and Sport in Bucharest, Department Career Training and the directorate of the Swiss Agency for Development and Research (SDR) of the Swiss Foreign Ministry in Bern) and on the other hand two development teams (Switzerland, Romania), made up of teachers from all relevant school levels and types, specialists in school development, members of the Romanian school inspectorate and designers, illustrators and professionals in the development of teaching and learning materials for schools. The impact of the project is being continuously evaluated in an accompanying research project and so a third area of cooperation is taking place in the form of collaboration between university fellows from both countries.

JOBS PROJECT: In the initial project phase both development teams collaborated to write pilot versions of the teaching and learning materials (2010-2012) which in turn were trialed in two schools (a technical school and a gymnasium in the town of Braşov). This was followed by a regional and national trial for the duration of two scholastic years (2013-2015). During this time span and in collaboration between the University of Bucharest and the development team, a professional development platform (teachers' e-learning) was set up for the further professional training of teachers involved in the project.

JOBS RESEARCH STUDY: In order to test the effectiveness and attainment of the aims of the new school subject and the teaching and learning materials, the research study was initiated. A team consisting of professionals from both countries is conducting the research study (2012-2017). The Romanian part of the team is made up of research fellows from the University of Braşov and Cluj-Napoca; the Swiss research fellows (PH Zurich) are responsible for the leadership of the evaluation study and the team itself, and additionally for the task of developing a corresponding further qualification of young Romanian researchers and academics (knowledge transfer; capacity building).

Implementing JOBS as a school subject demands a shift in teaching framework, teaching structure, and lesson design. These new requirements and instructional design are promoted and supported by professional development courses for teachers and handbooks for teachers that use the teaching and learning materials. The lessons place an emphasis on interaction: through discourse during the lessons and direct contact with the working labour market, students develop knowledge and awareness that are useful for making their career choices. The cognitively and affectively activating lessons are initiated by the tasks set in the teaching and learning materials and delivered by three teachers who have each trained in a different school subject and who work in an interdisciplinary way as part of the JOBS team. In this setting, the teachers are not primarily responsible for giving an explanation of the issues, but rather for accompanying the students in the work processes initiated by the set tasks. The tasks are set in such a way as to lead to a deeper examination of the surrounding circumstances and issues and the students' own view. In this process, there are no right or wrong answers, but a logical progression towards a broader understanding of everyday life contexts. Students should be able to present their insights logically and comprehensibly, so that whole-class discussions can take place in the classroom. It is the teachers' job to stimulate students with emotionally strengthening, pertinent questions in order to get

them to think further. This method of teaching demands a rethink of traditional classroom roles of students and teachers.

The RESEARCH STUDY is aimed at the level of the *students* and at the level of the *teachers* who influence the lesson setting and thereby the quality of the lessons themselves. The evaluation study aims to trace developments initiated by the JOBS program on both levels and to identify factors that facilitate and factors that restrict these developments.

The following *Report Part 1* contains results that were gathered during the period of collaboration. The initial results focus on students' learning outcome gained through participation in the JOBS program. It records through different approaches to the completed tasks and contexts such as textbook-based knowledge assessments, self-assessment of knowledge, skills and competencies gained in lessons, the relevance of knowledge and skills, and also the level of enjoyment and motivation associated with the completion of the tasks. For this, questionnaires were used to ascertain the students' and teachers' responses. These were then collected and compared to the responses of the control group of classes and their teachers.

In the first chapter the tasks, goals and the project organization are explained, followed by a specification of the theoretical framework of the research approach (chapter 2), the design of the study and also the methodological approach (chapter 3). Chapters 4 and 5 present the first results of both parts of the research study: A "students" and B "teachers". The focus is placed on the JOBS-based aspects of students' competence development in the first wave of the survey. Results of the effects of further relevant factors and developments at the level of teachers are imminent. A summary of the preliminary results in chapter 6 concludes the first part of then report of JOBS-RESEARCH-STUDY.

This report provides an insight into the fundamentals of the JOBS RESEARCH evaluation study. It seeks to communicate the first results on the development of knowledge, competence and skills of students regarding the contents worked on within the JOBS lessons. Ratings on these areas were surveyed from the perspective of students as well as teachers. The identification of effects and coefficient factors are currently being worked on; results that elucidate possible factors that facilitate or restrict developments follow subsequently.

1 Assignment, aims and project organization

In terms of the research and evaluation study, the expectations of the project commissioners are concerned primarily with the learning progress and knowledge acquisition of the participating students. Through the project's cooperative approach, in which project members from both countries work together, further aims are set. This double assignment, coupled with additional professional development of the partners in Romania, led to a complex project organization of the study. The study is subdivided into multiple phases. The accompanying evaluation assesses the extent to which the educational instruction of the subject 'JOBS' (teaching and learning materials as well as teachers' lessons) shows an effect on the development of the students and the extent to which individual and collective traits of teachers contribute to the students' learning process.

The research and evaluation study (called JOBS RESEARCH STUDY) should strive to achieve the following aims:

1) To identify the learning progress and knowledge acquisition of the participating students: To achieve this, a control group design is necessary so that differences between intervention groups and control groups can be diagnosed to identify the possible effects of the intervention JOBS.

2) To recognize the effects of the project on the students' development: The study will be conducted longitudinally, to recognize changes and identify further coefficient factors.

3) To provide further training and professional development for academics and researchers: For this, assessments to select the young researchers and academics must be designed in addition workshops to provide them with further training. In the workshops, project steps will be worked on and as an outcome of this process new necessary competencies will be acquired.

4) To conduct research in cooperation between two teams (Switzerland and Romania): to ensure this takes place, two teams with equivalent research and academic competencies are necessary.

In order to achieve the first two project aims, the attainment of learning objectives – in other words, of knowledge, skills and interests – a longitudinal design is used to compare the intervention classes (with use of teaching materials = JOBS) and control classes (without use of teaching materials = Non-JOBS). It was important to consider coincidences and situational and personal influences of the learners and the teachers and to locate these within the context of the lessons. To do this, the educational research proposal model of teaching and learning (Keller-Schneider & Albisser, 2012) was applied to survey pertinent, lesson-related factors amongst the participating teachers and students.

This includes attitudes to and educational beliefs about learning and the extent to which teachers and students have contributed to this. It also includes interests and motivation of the various agents and their social resources such as support of students through their teachers or parents. So that the quantifiable measurement relevant effects or errors of the longitudinal results can be controlled, the results will be analyzed after Solomon's (1949) longitudinal design.

An evaluation in the form of an adequate monitoring (Wottawa & Thierau, 2003) tests in a goal-oriented way the extent to which the intended effect of a given intervention was achieved. Evaluations can be conducted at various levels of a given educational process; depending on the chosen level, the degree of significance of the different results that arise varies. If nothing other than feedback on intervention programs is gathered, then the significance of the results is marginal and will explain only a small part of their effects (Lipowsky, 2010, 54); following this approach, data on the programs' effects cannot be fully obtained. If data on *changes in the areas of knowledge, skills and beliefs of students* are obtained, the explained variance can be extended and the reliability of the results of the evaluation can be improved (Lipowsky, 2010). The changing level of knowledge and individual resources such as beliefs,

goals and motives (Keller-Schneider, 2010) are made visible in pre and post program questionnaires which provide information about how these become manifest after the intervention. If following this, further results are obtained over a longer time it becomes possible to trace a change over time. However, the influence of further factors not directly relating to the intervention cannot be controlled.

We brought this approach into focus by using questionnaires to gather information from students and teachers (in two parts of the research study) in the longitudinal time frame of one year. We gained information on pre concepts and post concepts that are evident in the areas of knowledge, skills, beliefs, motives and goals and also self-regulatory resources and contextual factors. As far as it is possible, a follow-up interview will be conducted with a selection of students after their school graduation.

The *project organization* was carried out according to the following phases:

At the start of the project, an adequate research team could not be found at the recommended Faculty of Psychology and Educational Sciences of the University of Bucharest to develop an evaluation study after international standards. Due to the lack of this prerequisite central aspect to an academic cooperation, coupled with the time pressure resulting from the awaited implementation of the new teaching and learning materials in schools, the design of the research study and also the questionnaires for the students and the teachers were conceived, developed and produced by the Swiss research team, Prof. Dr. Manuela Keller-Schneider and Prof. Dr. Stefan Albisser, based on the previous work by the authors of the teaching and learning materials from Prof. Dr. Wiltrud Weidinger, Prof. Rolf Gollob and Prof. Martin Keller. Ms Tania Mihu from Bucharest supported the Swiss research team in their translation work and local organisation.

After a long process and demanding process of searching for cooperation partners, the following teams were formed. The collaboration began in 2013 and 2014, the teams contribute to the study by taking charge of the following tasks:

• Coordination of the survey with teachers and students in schools, entering the data and coordination of translations: Ms Daniela Felegean, Braşov (Transylvanian College)

• Team A: Evaluation of the quantitative data and the quantitatively processed results of qualitative content analyses: Dr. Laura T. David, Associate Professor at University of Braşov, Faculty of Psychology, Dr. Ana-Maria Cazan and Dr. Camelia Truta, Lecturers at University of Braşov, Faculty of Psychology

• Team B (just started): Analysis of the open questions to be qualitatively analyzed in the thematic areas of learning and attitudes: Dr. Alexandra Ioana Bolboaca Oltean and Dr. Claudia Alina Crişan, Lecturer at Babes-Bolyai-University Cluj-Napoca, Faculty of Psychology and Educational Sciences, Department of Educational Sciences

• Team C: Content analysis of students' answers to the open questions on teaching material-based knowledge: Ms Daniela Felegan, Ms Alina Gavrila, Ms Dorina Drahici, teachers of the JOBS project in schools of the town of Braşov

• Translation: For the translation of Romanian answers into English: Ms Monica Cotfas; from Hungarian into Romanian: Ms Andrea Ihos.

2 Theoretical position in the scientific discourse and key question of the research study

Orientating themselves in the working world and taking primary responsibility for themselves and for a subsequent generation, young people are posed a developmental challenge that they need to deal with upon their entry into adulthood (Havighurst, 1948; Dreher & Dreher, 1975; Krapp & Weidenmann, 2001; Albisser, Bieri & Keller-Schneider, 2011). These developmental changes have to be dealt with in order to gain a socially relevant position and to be able to contribute to society's development. The question of how to contribute to this developmental task is the primary concern of the JOBS project.

2.1 The development of knowledge and competence

Knowledge comprises an important foundation for being competent to deal with demands and expectations and to solve developmental tasks. Explicit knowledge can be taught, but only knowledge is not sufficient to acquire competence. Motives, goals and self-regulation have an influence on competence development as well (Baumert & Kunter, 2006; Keller-Schneider, 2010 and 2016). Competence is defined as a latent potential (Chomsky, 1981) that encompasses more than just factual knowledge in the sense of explicit and recallable knowledge. Competence becomes manifest through accomplishing tasks and challenges in concrete situations (Weinert, 2001; Neuweg, 2014).

Competence is essential to orientate and assert oneself in the working world. The acquisition of knowledge about working world is important, but further processing of knowledge is necessary to come to fruition through action. So that knowledge can last sustainably and support even in challenging situations, a transformation of factual knowledge into subjective knowledge is necessary. Within this transformation thought structures were changed though getting experience and insights, crosslinking can be integrated (Neuweg, 2014). During the process of competence development, different stages of competence acquisition can be described. There stages can be used to determine the changes in thought structures (Dreyfus & Dreyfus, 1986; Berliner, 2001; Neuweg, 2004; Keller-Schneider, 2010). In this way, a beginner's knowledge is distinguished by singular, loosely connected rule and fact-based knowledge that gradually transforms – through increased experience – into cognitive connections and synergies. These in turn allow the learner to view challenging demands and the handling of them through multiple perspectives. Further synergies evolve with increasing competence development. This process transforms the originally explicit knowledge into intuitively applicable knowledge that makes it possible to handle demands in a more holistic way, taking multiple perspectives into account. Thus, the recall of explicit knowledge is reduced. Competence as latent potential for the accomplishment of tasks and handling of demands are in various contexts can be enriched by taught knowledge. The complexity of the knowledge to be acquired – described in terms of learning objectives – is a further factor that determines competence development (Anderson & Krathwohl, 2001).

The competencies that are developed during the JOBS program can be divided into different goals that are connected to learning objectives of varying complexity (Anderson & Krathwohl, 2001). These goals can be attained through a diverse range of tasks and learning pathways. Following on from explicit elements of knowledge, a deepened understanding of context is strived for, in addition to the ability to consider various aspects to approach the situation from different angles and to apply a range of approaches and methods to overcome complex situations. The most complex and challenging task is that of using subject and factual knowledge, that has been acquired and structurally integrated and must be connected with one's own interests to gain access to the real working world. Not only cognitive factors are significant during this process, but also emotional, motivational and volitional ones (Weinert, 2001).

Educational instruction lay the foundation that enables students to learn. Best practice in teaching is marked by quality standards such as a good fit between the goals of a learning setting and the needs of the students, their cognitive and affective activation and a learning-centered use of lesson time, focused

on the learning outcome (Hattie. 2014; Helmke, 2003; Meyer, 2008). A classroom atmosphere in which learning is fostered offers students security to learn and to experience themselves as effective, competent and accepted learners (Drössler, Jerusalem & Mittag, 2007). This is of great importance for the development of not only young people (Deci & Ryan, 1993). To learn with sustainable outcome requires an ability to engage oneself in learning processes, search for answers and try out solutions. To be able to solve tasks and to be allowed to make mistakes are crucial. In other words, learners should be able to explore pathways to find their way towards fruitful solutions through content-focused and learning-oriented dialogue. Being "allowed to learn" is a process with uncertain outcome which constitutes a further important domain of quality of instruction.

The JOBS lessons supported by teaching and learning materials, aim to equip teachers with an instrument with which they can design interactive lessons. Even if they have not previously learnt to structure their lessons in an interactive way, they can still facilitate their students' exploration of the working world, the regional opportunities available to them and their own strengths and interests. The altered instructional design poses new challenges for the teachers. Attending JOBS program with challenging experiences they can go further on in their professional development (Wittek, 2013; Hellrung, 2011). Even if the demands of giving JOBS lessons is not met and does not lead to a process of professional development (Keller-Schneider, 2010), a successful educational instruction is still possible to give the students the possibility to work on tasks in the sense of JOBS program, as could be shown in evaluations of the effect of using such kind of teaching and learning materials (Balmer, 2007).

In the JOBS lesson setting, learning takes place as an interactive process in which students, as participatory and co-designing agents, develop knowledge and understanding. This demands a willingness not only to engage with the context but also with the aims, motives, and realizations: to allow oneself to engage more deeply in a process of examination and exploration and thereby in the lessons themselves. That learning outcomes are strengthened by an intense use of learning opportunities and engagement in the handling and solving of challenges and problems has been well documented (Helmke, 2003, Keller-Schneider, 2013 and 2014).

In this sense learning, as aspired to in JOBS project, is an education process builds up knowledge, competence and self-competencies. Moreover, learning is also a process that changes these competences in the sense of strengthening an individual's potential and possibilities. JOBS thereby does not so much aim for the acquisition of factual knowledge and subject matter, but rather works towards strengthening students in their ability to self-direct, self-design and to effectively deal with the requirements and demands they encounter in various situations.

However, an instructional design with such a multifarious range of goals (Anderson & Krathwohl, 2001) places the requirement on students to open themselves up to a process of active engagement dealing with the demands and requirements posed to them. Individual traits and attributes contribute to this as resources with which challenges were perceived, approached and dealt with (Keller-Schneider, 2010). Qualitatively good educational instruction contributes by providing a prerequisite for this process to take place (Hattie, 2014; Helmke, 2003; Meyer, 2008). JOBS lessons as offered learning opportunities should have a significant impact on the learning outcome of the students, but individual resources to perceive and solve requirements are of a great importance as well.

2.2 The perception of challenges in the learning context

If learning opportunities are actively made use of by learners, in other words, if knowledge and understanding is developed through intensive engagement with and handling of contexts and challenges, then competence development as strengthening of subjectively anchored knowledge is also reinforced. The resulting experiences alter the fabric of the competencies that are at the learner's disposal when dealing with subsequent challenges and tasks, offering a broader pallet of possibilities and potential. Following the model of offer and use of in-class learning opportunities (Fend, 1998 and 2006; Helmke, 2009), the effectiveness of a teaching and learning sequence is not only determined by the teachers and the lesson they designed, but also by its use as a stimulus by the learners themselves (Keller-Schneider, 2013b, 2014). The individual perception and interpretation of requirements is based on individual resources such as knowledge, beliefs, motives and willingness to engage (Baumert & Kunter, 2006). These characteristics contribute to the extent to which a task is perceived as a challenge and dealt with in an engaged process (Keller-Schneider, 2010, 113). The perception, assessment and handling of lesson stimuli by students takes place within the dynamic interplay of components of their individual resources and is also codetermined by contextual factors.

Tasks and stimuli in general are perceived with individual resources, such as knowledge, skills, beliefs and collective norms, goals and motives. Based on an assessment of the extent to which they are deemed workable, they are either accepted as challenges to be dealt with, or are avoided as unsolvable or not significant (see: theory of stress and resource approaches, Lazarus & Folkam, 1984; Hobfoll, 1989). If lesson stimuli are accepted as a challenge and if they lead to a deeper engagement with the task posed within a lesson setting, then knowledge and understanding results. These insights will be integrated in the individual resources. These offer an altered frame of reference for subsequent challenges (Keller-Schneider, 2010, 115). In this process, lesson sequences offer a binding framework in which clearly articulated demands, in the form of expectations directed at students, are made. What is perceived and accepted as significant and workable is not only a question of the offered learning opportunities of the lesson, but also of how the students as lesson *users* put them to *use* (*Figure 1*).
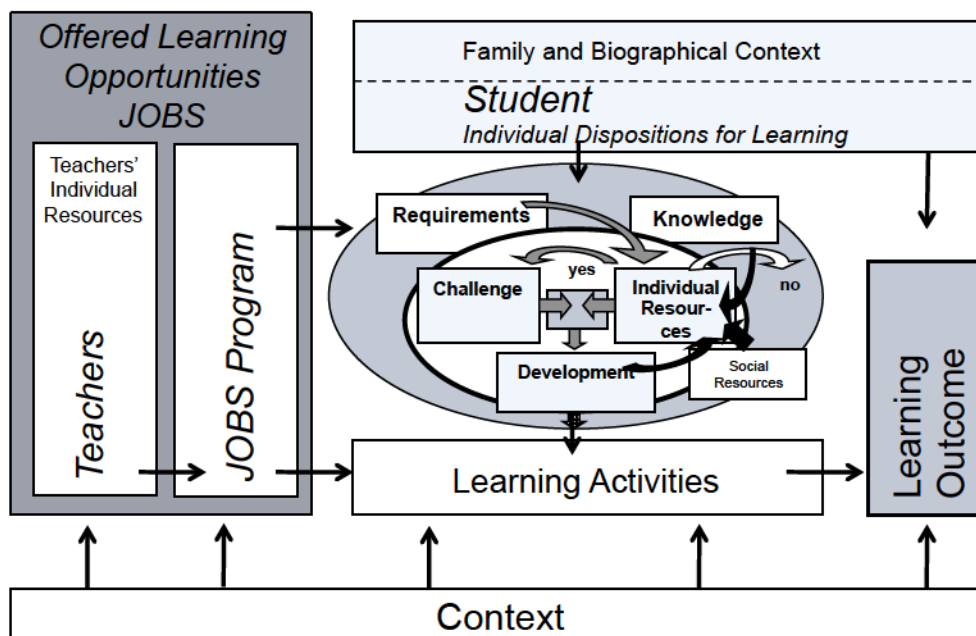

Fig. 1:   The process of using learning situations in an interplay of learning opportunities, use, family background and individual problem-solving behavior as predictors of possible learning outcomes (Keller-Schneider 2014, 149; adaptation to JOBS as a learning opportunity set in cursive).

Self-efficacy as a belief (Jerusalem & Klein Heßling, 2009), that demands can be mastered using one's individual skills and effort, as well as a positive self-concept about one's own skills (Möller & Trautwein, 2009), are important conditions for the consistent tackling of demands and challenges.

The model in *Figure 1* shows the learning opportunity offered by JOBS and its interplay with the two components of "classes" and "teachers" (and their individual resources with which they perceive and interpret requirements). The learning opportunity offered by JOBS becomes effective through engagement with and use of learning activities and leads to the learning outcome (effects of JOBS program). The extent to which requirements are accepted and dealt with as challenges leads to competence development, influenced by individual resources. Familial resources of students and the social resources that can be activated are further contributing factors in this process. This model serves to illustrate the steps of evaluation of the JOBS RESEARCH study.

2.3 Teachers as responsible agents for the instructional design and the offered learning opportunities

Teachers design learning opportunities and are responsible for the lessons that should lead to the aimed-for acquisition of competencies amongst students. In the JOBS project, the instructional approach, in which students work on tasks, is explained in the teacher's handbook. In this way, teachers are relieved of some of the decisions about instructional design and lesson planning. In other words, a setting is prescribed that should lead to the attainment of goals, even if the teachers do not know how to conduct interactive settings of learning or do not bring with them beliefs that fit to learning approach of JOBS program (Blömeke et al., 2008 and 2011, Reusser & Pauli, 2014).

The developed JOBS setting encompasses not only an intervention targeted at students but also an innovation directed at teachers. In this sense, it is necessary for teachers to engage with the project-specific challenges. This challenge includes providing cooperatively lead and interactively designed lessons. The question arises in which extent experiences with this interactive teaching and learning approach can lead to changes in their individual resources and professional competencies. The question is, if JOBS program leads to developmental processes amongst teachers.

As students and teachers work on the project and are encouraged to respond to and engage with project-based requirements, a design emerges with which not only project-based developments of students can be examined (see *Figure 1*), but also developments in the professionalization processes of the teachers working on the project.

2.4 Research questions

Assuming that a specific lesson can impart knowledge and competencies, and assuming that individual and contextual resources can contribute to the development of competencies, the following questions become pertinent. They will be answered with in the scope of JOBS RESEARCH study. These questions are outlined in each of the following part studies. The report 2015 contains the results, gained until June 2015.

Results on questions 1 to 4 are presented in the report part I, in which the acquisition of JOBS-based knowledge and skills is focused on. These questions are examined from the perspective of the students as well as from the perspective of teachers. The results of the other questions (from question 5 onwards) will follow in the report part II.

2.4.1 Study A – Students

Knowledge, and skills of students about the working world and own abilities and interests:

1) Which extend of knowledge, skills and interests relating to the working world and relating to own strength do students have at the beginning and at the end of the JOBS intervention program?
2) Which differences between the students of the control group and the students of the intervention group can be identified in these areas?
3) Which developments regarding knowledge, skills and interests can be identified?
4) Which differences can be identified between the intervention and control group about the scope of knowledge and skills as well as the significance of them?

Individual traits of students as resources:

5) Which characteristics become apparent in the individual traits of the students (self-efficacy, motivational orientation about learning, general work-related motives, self-concept about subject-competence in school subjects and self-competence about learning)?
6) Which differences between the intervention and the control group are visible?
7) Which significant changes can be identified, in the intervention group?
8) Which effects on the learning outcome of JOBS program can be identified?

Students' perception of the school environment:

9) How do students perceive social resources within the school context?
10) Are there differences between context factors of the JOBS lessons and regular lessons?
11) Are there significant changes concerning the perception of the context factors, in the intervention group?
12) Which impact do these factors have on knowledge acquisition, beliefs about learning and the development of interests?

Familial resources of students

13) Which familial resources do students have?
14) Are there differences between the intervention and the control group?
15) Are there significant changes, in the intervention group?
16) Which factors of family resources promote or inhibit the knowledge and skills acquisition fostered by the JOBS program?

Effects on the knowledge acquisition of students:

17) Which impacts have specific individual, familial and academic resources on the acquisition of knowledge and skills amongst students?
18) Which factors promote or inhibit the knowledge and skills acquisition fostered by JOBS program??
19) Which effects do individual traits of the teachers have on the knowledge and skill acquisition of the students?
20) Which effects do collective traits of teacher-teams have on the knowledge and skill acquisition of the students?

2.4.2 Study B – Teachers and Staff Teams

Teachers' assessment of knowledge and skills of the students on the working world and on their own abilities and interests:

1) How do the teachers evaluate students' knowledge and skills concerning the working world and their own skills at the beginning and at the end of JOBS intervention program?

2) Which differences can be identified between the intervention and the control-group, evaluated by the teachers?
3) How do teachers of the intervention and control groups evaluate the development of job-related knowledge and skills as well as interests amongst their students?
4) What differences can be identified between the intervention and the control groups concerning knowledge and skills, evaluated by the teachers?

Evaluation of the individual resources of the students:

5) Which individual resources do have teachers of the intervention group and the control group (self-concept, motives, beliefs)?
6) Which differences between the intervention and the control group can be identified?
7) Which changes can be identified, concerning the intervention group?
8) Which effects on knowledge and skill acquisition of the students can be identified?

Collective resources of the staff teams:

9) How do teachers perceive social resources of the school context?
10) Which differences between JOBS and subject teachers can be identified concerning cooperation and team quality?
11) Which changes regarding cooperation and team quality can be identified?
Which impacts have collective resources of the staff team on the knowledge and skills acquisition of the students?

To examine the research questions, the following design has been developed.

3 Design and methodological approach

3.1 Design of the study

The study is aimed at the level of the students as well as the level of teachers. Two part studies are required. To identify changes in terms of knowledge, beliefs, motives and self-regulation within the time duration of a full scholastic year, the study is designed as a pre- and post-test study with control group (see *Figure 2*).

3.1.1 Pretest and posttest design

To identify changes and to focus on up-to-date experiences of dealing with requirements the same instruments were used in the survey before and after the intervention. In this way, possible distortions resulting from evaluations made in hindsight can be avoided (Keller-Schneider, 2014b). Evaluations with pretest and posttest lead to evaluations of the current situation based on actual realities. A comparison of the assessments taken at these different times allows to identify changes and leads to reliable results (Lipowsky, 2010).

3.1.2 Control group design

For the verification of the identified changes and to check the possible effects of the intervention JOBS a control group design is used. In addition to the JOBS intervention group, the same number of classes and teachers not working in the JOBS program were participants of the control group.
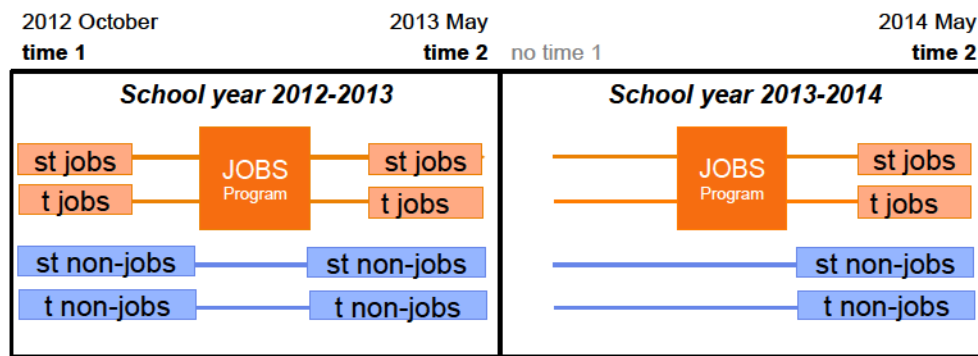
Fig. 2: Design of the JOBS RESEARCH study (an intervention study in a pretest and posttest with control groups, Solomon design) during the school years 2012/13 and 2013/14.

3.1.3 Solomon Four-Group Design

The four-group design after Solomon (1949) tests whether groups of students and/or teachers who took part in the longitudinal study differ significantly from those who were questioned only in the second investigation. To verify such pretest effects (to check the learning effect of the first process on the results of the second), Solomon's four-group design has been chosen, which investigates two groups exclusively at the time of the second investigations of the pretest and posttest questioning (Bortz & Döring, 2002, 539f.). As all JOBS classes were questioned in the school year 2012-13 and as no regional expansion of the project to further schools followed in the school year 2013-14, the new classes were questioned only once during the second project year to complete the study design after Solomon (see *Figure 2*).

3.1.4 Teachers and teams as contextual factors influencing students' learning and as agents in school development processes

Teachers constitute an important factor in learning situations. By their individual resources, such as beliefs, motives, self-regulation and competences, they codetermine the effect of the lessons, intended by the authors of the teaching and learning materials. For this reason and to identify the possible effects of these individual resources, teachers are not only questioned about how they rate the acquisition of JOBS-oriented knowledge and skills amongst their students, but are also questioned as to their motives, beliefs, goals and self-regulation.

In studies of school effectiveness, the quality of teamwork is identified as an important resource and cooperation as a significant process factor (Fend, 1989; Bonsen, 2006; Stufflebeam, 1984; Keller-Schneider & Albisser, 2013). Additionally, to test the possible effects of teamwork on the acquisition and change of students' knowledge and skills, the teachers are questioned as to their estimation of team quality and cooperation in the JOBS teams and in the subject teacher teams. In this way, the extent to which the JOBS program contributes to school development processes can be identified.

3.2 Sample description

Students and teachers from eighteen schools have been included in the study, nine of them are gymnasiums and nine are technical high schools. For each school, the JOBS class including its teachers (intervention group) and one class that did not take part in the JOBS program (control group) including three to five teachers of this class were questioned. Table 1 and 2 show the arrangement and the scope of the samples including the first wave of data for the JOBS RESEARCH study. The sub-samples are shown in their relevant subdivisions in *Figure 3* and *Figure 4*.

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Tab. 1: Sample per part study (students and teachers), by JOBS and NON-JOBS groups, school type and gender.

School type	JOBS (intervention group)						NON-JOBS (control group)					
	Students			Teachers			Students			Teachers		
	To-tal	m	f	To-tal	m	f	To-tal	m	f	To-tal	m	f
Gymnasium (Gym)	404	191	213	63	10	53	542	261	281	98	11	87
Technical college (TC)	392	224	168	48	2	46	534	300	237	92	16	76
Total	796	415	381	111	12	99	1077	561	518	190	27	163

m = male, f = female

3.2.1 Students in the intervention groups and the control groups

The data represented in *Table 1* and in *Figure 3* on the sample of students has been tested by their distribution according to significant discrepancies between the intervention groups and the control groups (Chi^2-Test).

Students' distribution by school type and gender within the samples of JOBS-Classes and Non-JOBS-Classes
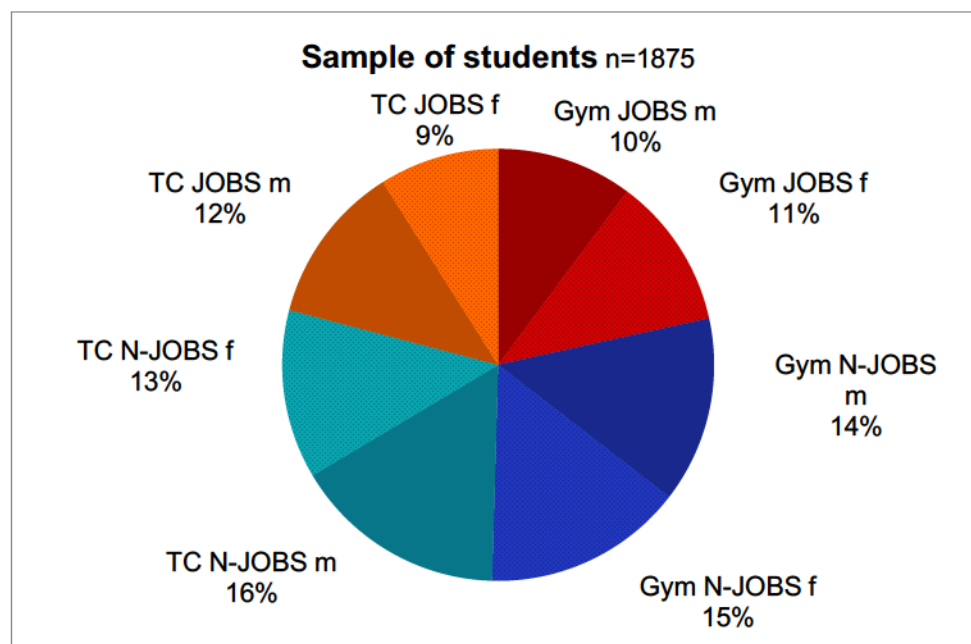
Fig. 3: Sample of students (wave 1): intervention and control group (orange – blue), school type (gymnasium = dark, technical high school = light) and gender (stripes = male, dots = female).

Distribution according to school type (gymnasium - technical college): There is no significant statistical difference shown between the intervention groups and the control groups related to school types. In the samples (JOBS-classes and Non-JOBS-classes), the school categories of gymnasium and technical college are equally represented (Chi^2 after Pearson (1, N= 1875) = .050, p= .43).

Distribution according to gender: The intervention and the control groups do not differ in the distribution according to gender, whether investigated as a whole or according to school types (not statistically significant) (Chi^2 after Pearson: Total (1, N= 1875) = .004, p= .494; Gym (1, N= 946) = .071; p= .793; TC (1, N= 929) = .150; p= .738).

Distribution of gender according to school type: In the distribution of gender according to school type a considerable deviation can be seen. Women are represented over proportionally in the classes of the gymnasiums, men in the classes of the technical colleges (Chi^2 (1, N= 1875) = 13.969, p < .001).

In the distribution per sub-samples (JOBS, Non-JOBS) an unequal distribution is visible, although less stark (JOBS (1, N= 796) = 7.76; p= .006; N-JOBS (1, N= 1079) = 4.426; p= .012).

The intervention and the control groups (JOBS and Non-JOBS) differ neither in their distribution according to school type, nor in their distribution according to gender. However, they form an asymmetrical distribution of female and male students specific to school type.

Distribution of students according to age/year group per school type
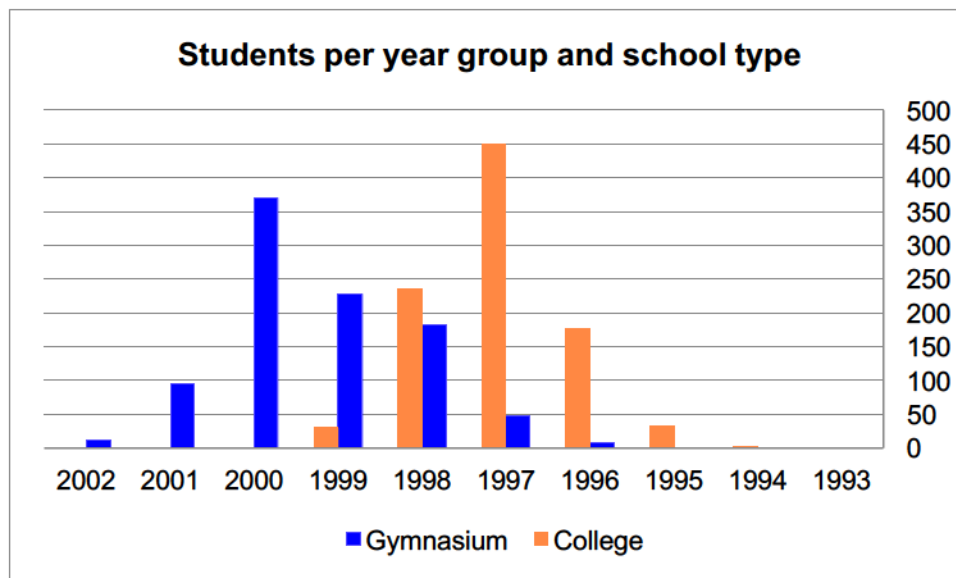
Fig. 4: Number of students per year group, differentiated by school type

In the gymnasiums, the JOBS program was carried out in the seventh school year and in the technical high schools it was carried out in the ninth school year (see *Figure 4)*. This difference is mirrored most significantly in age, recorded per year group (birth year) (Chi^2 (1, N=1875) = 461.96, p < .001).

Distribution of students according to age per sub-samples (JOBS and Non-JOBS)
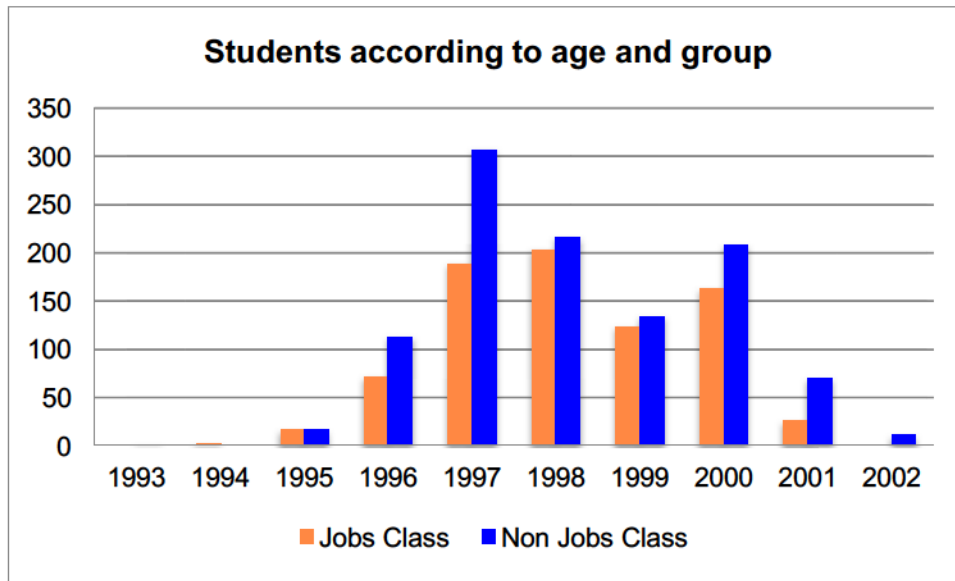
Fig. 5:   Frequency of birth year, per intervention and control group

The statistical examination of the distribution of frequency of year groups shows considerable differences between students belonging to the intervention groups and students belonging to the control groups; the proportion of Non-JOBS students is greater than those in the JOBS groups (Chi^2 (1, N=1875) = 36.54, p< .001). Upon examination, the bar chart illustrating the frequency of birth year in *Figure 5* shows no shift in distribution, in other words the age groups appear to be evenly represented in both samples (JOBS / Non-JOBS). The only exception is the year group 1997, which shows a higher frequency of representation within the Non-JOBS group.

3.2.2   Teachers of the intervention and control groups

The data represented in *Table 1* and in *Figure 6* on the samples of teachers has been tested by their distribution according to significant discrepancies between the intervention groups and the control groups (Chi^2-Test).

Samples of teachers
n= 301

- TC JOBS f — 1%
- Gym JOBS m — 3%
- Gym JOBS f — 18%
- TC JOBS m — 15%
- TC N-JOBS f — 5%
- Gym N-JOBS m — 4%
- Gym N-JOBS f — 29%
- TC N-JOBS m — 25%
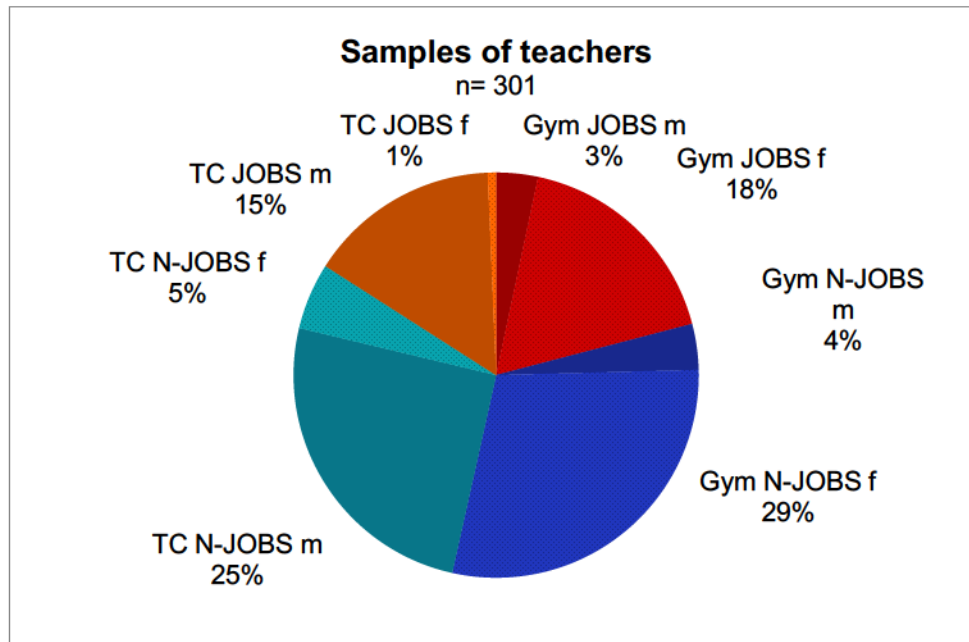
Fig. 6: Samples of teachers (n=301), distributed according to intervention group and control group (orange – blue), school type (gymnasium = dark, technical high school = light), as well as by gender (stripes = male, dots = female).

Distribution according to school type (gymnasium – technical college): The intervention and control groups do not differ according to the school types. The groups of teachers who work in the school types gymnasium and technical college are equally represented in the sub-samples (Chi^2 after Pearson (1, N= 301) = .755, p= .404).

Distribution according to gender: The intervention and control groups with teachers of the gymnasium do not differ according to gender (Chi^2 after Pearson: Total (1, N= 301) = .718, p= .48; Gym (1, N= 161) = .731; p= .474). Within the sub-sample of the JOBS-teachers at technical schools (technical college), women are overrepresented in comparison to men (Chi^2 after Pearson: TC (1, N= 140) = 4.924, p= .032).

Distribution of gender between school types: In both school types, male teachers are underrepresented (Chi^2 (1, N= 301) = .002, p= .55). Within the sub-samples JOBS- and Non-JOBS-teachers, the unequal proportion of gender distribution is confirmed (JOBS (1, N= 111) = 3.87; p= .065; Non-JOBS (1, N= 190) = 3.84; p= .299).

The intervention groups and control groups (JOBS and Non-JOBS) differ neither in their distribution according to school type, nor according to gender and form a school-specific, asymmetrical distribution of male and female teachers. This asymmetry is even more prominent in the group of JOBS teachers. In other words, there are considerably more female teachers working on the JOBS project at the technical schools (technical colleges) than male teachers.

Teachers according to age group
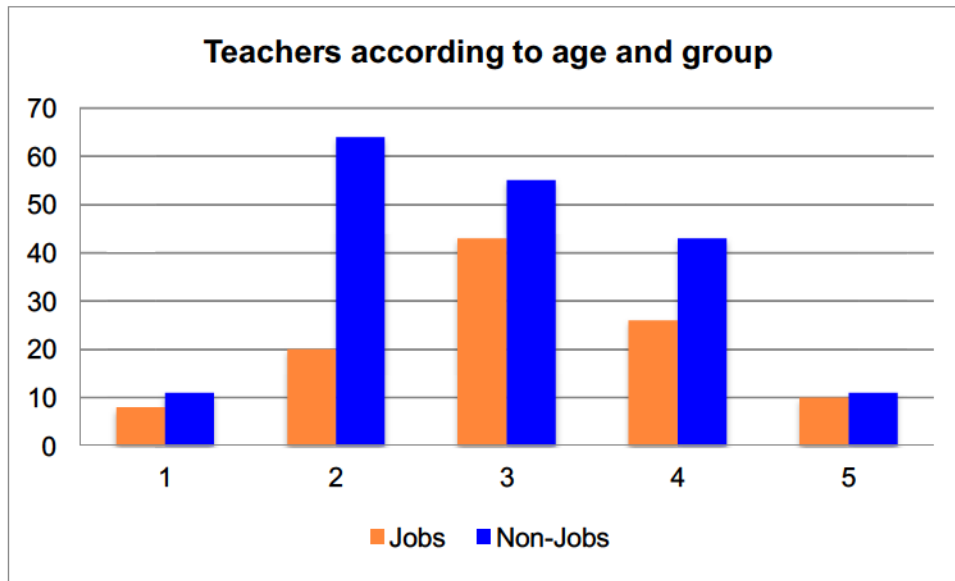
Fig. 7: Number of teachers per age groups (divided by M+/- ½ SD, or M+/- 1 SD), by intervention group and control group

If the samples of teachers are investigated according to their age distribution, then the greatest frequency of Non-JOBS-teachers fall into an age range that is slightly below the average (see *Figure 7*). By contrast, JOBS teachers fall into the average age range. If both samples are compared to the average age, then no significant differences can be ascertained (JOBS M= 44 years, SD= 9.5J; Non-JOBS M= 45.2 years, SD= 9.15J; ANOVA $F(1, 298)= 102.06$, p= .29, n.s.).

3.2.3 Intervention and control group samples according to school type in consideration of the longitudinal and cross-sectional data (Solomon design)

Tab. 2: Sample size of the longitudinal and cross-sectional data (Solomon design) by group and school type

School type	JOBS (intervention group)						Non-JOBS (control group)					
	Students			Teachers			Students			Teachers		
	Total	L_{t1-t2}	Q_{t2}	Total	L_{t1-t2}	Q_{t2}	Total	L_{t1-t2}	Q_{t2}	Total	L_{t1-t2}	Q_{t2}
Gymnasium[1]	404	181	204	63	44	14	542	178	335	98	35	51
Technical college[1]	392	160	189	48	31	12	534	160	330	92	25	54
Total	796	341	393	111	75	26	1076	338	665	190	60	105

[1] The deviation shows the number of people who answered the questionnaire only during the first inquiry (JOBS-students n=62, Non-JOBS-students n=76, JOBS teachers n=10, Non-JOBS-teachers n=25).

Table 2 shows the sizes of the samples. Concerning the four groups of Solomon design, no statistically significant differences can be identified (Chi^2 n.s.). The basis for the investigation of group effects can therefore be judged as comparable.

3.2.4 Distribution of schools and areas in the County Braşov

Tab. 3: Number of students and teachers questioned according to school type, area and school

School type	Area	School	Students Anz.	%	Teachers Anz.	%
Technical college	Brasov	CT Transylvania [1]	87	5.0	16	6.0
		CT Tara Barsei	73	4.2	16	6.0
		CT Maria Baiulescu	100	5.8	15	5.6
		CN Economic	124	7.1	19	7.1
		CT Transporturi	91	5.2	13	4.9
		CT Rucareanu	102	5.9	12	4.5
		CT Senchea	112	6.4	18	6.8
		CT Mehedinti	108	6.2	15	5.6
Gymnasium	Brasov	School 25 [1]	115	6.6	15	5.6
	Rasnov	Liceu Rasnov	80	4.6	13	4.9
		School Vama Buzau	94	5.4	11	4.1
	Sacele	School Sacele	86	5.0	19	7.1
	Ghimbav	School Ghimbav	83	4.8	19	7.1
		School 14	101	5.8	15	5.6
		School 19	91	5.2	10	3.8
		School 31	99	5.7	10	3.8
	Aprily Lajos	School Aprily Lajos	94	5.4	14	5.3
	Prejmer	School Prejmer	97	5.6	16	6.0
		Total	1737	100.0	266	1000.0

Overall it can be ascertained that the sample groups of JOBS and Non-JOBS do not differ in the examined sample criteria and in the proportional distribution of frequency (*Table 3*). Only in the age of the students there is a difference between the school types gymnasium and technical college, caused by the fact that the students of gymnasium were questioned one year earlier than the ones of technical schools.

3.3 Instruments

The following instruments were applied in the questionnaire used in the research study, grouped by the areas shown in *Figure 1* (see *Table 4*). To facilitate a general overview, the instruments used in both studies (students and teachers) are listed synoptically.

Tab. 4: Overview of the instruments employed: synoptic representation per part-study (students and teachers)

Instruments for students						Instruments for teachers		
Focus	Scaled questions	Open questions	Items (N)	Scales	Text	Focus	Scaled questions	Open questions
JOBS-related [1]								
Performed knowledge of the subject "JOBS"	k				17			
Self-assessed knowledge	ek		11	1		Assessment of students' knowledge	ek	
Relevance of this knowledge	er		11	1		Relevance of students' knowledge	er	
Self-assessed skills	spot		15	1		Students' acquired skills	spot	
Relevance of skills	simp		15	1		Relevance of students' skills	simp	
Enjoyment by using skills	spla		15	1		Students' joy using skills	spla	
What I have learnt in JOBS		tst02			1	What students learn in JOBS		tte02
Knowledge about the working world	eval01		1			Students' knowledge about the working world	eval01	
Knowledge about the own strengths/interests	eval02		1			Students' knowledge about their own strengths/interests	eval02	
The context of learning and instruction (School as a learning context) [2]								
School type			1			School type		
Support of teachers generally	supL		4	1				
Support of JOBS teachers	supL		4	1				
Teachers' expectation on students' learning	rele03				1			
Teachers' contribution to students' learning		tst05			1	Contribution of teachers to students' learning		tte05
						Collective resources [3]		
			16	3		Importance of cooperation between teachers within the subject group	klt	
			16	3		Frequency of cooperation between teachers teaching the same subject	klt	
			17	4		Team quality (subject teachers)	tea	
			16	3		Importance of cooperation between JOBS teachers	klt	
			16	3		Frequency of cooperation between JOBS teachers	klt	
			17	4		Team quality (JOBS teachers)	tea	
Family context [2]								
Parental support	par ...		6					
Parental expectations	par01		1					
Equal expectations of both parents	par06		1					
Fam: level of qualifications F/M	qual		2					
Fam: education F/M	prof		2					
Fam: occupation F/M	occ		2					
Family composition	fam_hous_		8	1				
Number of siblings	num_brosist		1					
Position in birth order	rank_brosist		1					
Relevance of learning for parents	rele02		1					

What do your parents find important for you to learn at school		tst07		1		What do parents find important for students to learn at school	tte07
Individual characteristics							
Gender	sex	1				Gender	sex
Age	age	1				age	age
Self-concept (S-c)						**Self-concept**	
Self-concept subject competence [2]	fk	10	1				
Self-concept subject interests	fv	10					
S-c: general self-competence	es	5	1				
S-c students: I learn well when…		tst		1		S-c teachers: I teach well when…	tte15
Self-efficacy						**Self-efficacy**	
Self-efficacy general [4]	sw 1-8	8	1			Self-efficacy, general [4]	sw 1-8
Self-efficacy, school-related [4]	sw 11-	5	1			Self-efficacy, teacher-related [4]	lsw
Self-efficacy, social-related [4]	sw 25-	4	1				
Beliefs about learning						**Beliefs about learning**	
Beliefs on teaching and learning [5]	ltue	18	2			Beliefs on teaching and learning [5]	ltue
Orientation towards different reference standards of performance measurements [6]	nor	11	3			Orientation towards different reference standards of performance measurements [6]	nor
Relevance of school learning [2]	rele01	1				Relevance of school learning [2]	rele01
Relevance of school learning pertaining to future [2]	rele04	1				Relevance of school learning pertaining to future [2]	rele04
I learn well ... [8]		tst01		1		Students learn well... [8]	tte01
				1		Optimizing learning	tte12
				1		How can a teacher contribute	tte13
				1		How can a school contribute	tte14
Use of learning		tst03		1		Use of learning	tte03
Own contribution to learning		tst04		1		Students' contribution to learning	tte04
What should students learn at school		tst06		1		What should students learn at school	tte06
Motives						**Motives**	
Learning motives [7]	mo	12	3			Students' learning motives [7]	mos
Motives for work and occupational career [3]	wi	24	4			Motives for work and occupational career [3]	wi
Interest in working world [2]	eval03	1				Interest in working world [2]	eval03
Interest in own strengths [2]	eval04	1				Interest in students' strengths [2]	eval04
Project participation JOBS							
Follow-on study/training/occupation [2]		Job_2		1			
				6	1	Reasons for project participation [3]	proj
				3	1	Changes since JOBS project start (J) [3]	proj4

Sources:

[1] Instrument for recording knowledge, competence, relevance of knowledge and competence and/or abilities, as well as enjoyment of carrying out work relating to set tasks based on the units in the JOBS teaching and learning materials, developed based on Hannes Schaad's content analysis (co-author of the teaching and learning materials).

[2] Further questions developed for the JOBS questionnaire JOBS

[3] Instruments from the RUMBA project Keller-Schneider & Albisser (2010 unpublished).

[4] Scales for recording self-efficacy; see Schwarzer & Jerusalem, 1999.

[5] Instruments from the study «Selbstreguliertes Lernen an der Hochschule», Keller-Schneider 2012: Lerntheoretische Überzeugungen (Keller-Schneider, 2012 and 2017)

[6] Orientation towards different reference standards of performance measurements: Dickhäuser & Rheinberg (2003)

[7] Learning and performance motives SELLMO (acronym) by Spinath et al. (2002)

[8] Open questions developed in the project «Entwicklung adaptiver Unterrichtskompetenz», Keller-Schneider & Albisser (2012)

3.3.1 Instrument to assess knowledge and competencies regarding JOBS content

This instrument was developed for the JOBS RESEARCH study, to record and assess knowledge and competencies relating to the content of the JOBS teaching and learning materials. Following a content analysis by Hannes Schaad that was then taken up in the various chapters of the lesson textbooks and expounded in the form of tasks, questions were developed which record the content areas in terms of (A) knowledge, (B) self-reported competence and (C) skills and abilities. As knowledge alone does not suffice for the acquisition of action competence (see chapter 2), the same question content is highlighted from the perspective of motivational components.

Based on knowledge and skills, the following areas result:

A) Knowledge test

B^k) Self-assement of knowledge

C^{pot}) Self-assessment of skills as ability to carry out specific tasks and challenges

The assessment of motivational components follows from the following perspectives:

B^R Relevance of knowledge of the JOBS subject matter

C^{imp} Relevance of skills

C^{pla} Valence (enjoyment experienced when carrying out the tasks)

The analysis of contents followed the sequence of units in the textbooks so that the successive buildup of knowledge and skills in the JOBS lessons could be reflected in the questionnaire (see *Table 5*).

Unit 1: Investigating different people's job biographies
Unit 2: Me and my strength
Unit 3: Exploring a box full of surprises
Unit 4: JOB opportunities
Unit 5: Ready for the JOB
Unit 6: Business visit

Tab. 5: Basic structure of the instrument for knowledge and competencies about JOBS-related issues (based on the teaching and learning materials)

	Knowledge by test (Based on issues that are broached in the teaching and learning materials, following the sequence of the textbooks)		Knowledge by self-assessment I can fulfil a particular task/challenge… I find it important to fulfil a particular task/challenge		Skills by self-assessment I can carry out a particular activity… … I can do it well … I find it important … I like doing it
	Open questions → for text-based answers, multiple answers		Scaled questions: 1= very bad - 6= very good; 1= very unimportant - 6= very important		1= very bad - 6= very good 1= very unimportant - 6= very important 1= I don't like it at all – 6= I like it very much
Unit 1 Investigating different people's job biographies					
$K11^4$	How do you plan an interview?			S11	Conducting an interview to learn more about a job
$K12^4$	Which questions do you use when you interview a business-person?	E12	I know how to ask questions… Knowing how to ask questions I find…	S12	Asking questions...
				S13	Depicting the post important information about a job on a poster...

Unit 2 Me and my strengths					
K21[4]	Name your strengths	E21	I know my strengths… I find knowing my strengths…	S21	Speaking about my interests and strengths…
K23	Which professional interests do you have?	E23	I know my career interests… I find knowing my career interests…		
Unit 3 Exploring a box full of surprises					
K31	Name the differences between work and leisure time.	E31	I can tell the difference between work and free time… I find telling the difference between work and free time…		
K33[4]	With which kind of characteristics can you describe a profession?				
K34[4]	Which professional fields do you know?	E34	My knowledge about jobs is… I find knowing something about occupational fields…		
K35	How do work, money and spending go together?	E35	I know how work, money and consumption are related… I find knowing how work, money and consumption are related…		
				S37	Working together with my friends/colleagues…
				S39	Making a mind map…
Unit 4 JOB opportunities					
K43[4]	Why are there differences in salaries? How do you explain different salaries?				
K45[4]	How much is: 1loaf of bread (500g) 1 l of milk 1 kg of apples 1 kg of cheese 1 kg of beef 1,5 l coca cola 1 pair of jeans 1 pair of trainers 1 winter coat 1 packet of headache pills 1 bus ticket 1 DVD of a film 1 newspaper 1l petrol	E45	My knowledge about important nutritional and other consumer products (food, train/bus tickets, clothes, phone) is… I find knowing the cost of consumer products…		
K47	There are people who work full time (100%) and are still poor. What reasons do you know? Describe.	E47[3]	I know the circumstances that lead to becoming working poor… I find knowing the reasons for becoming working poor…		
				s4y	Finding an article on the Internet on a theme…
Unit 5 Ready for the JOB					
K51	Name businesses or companies in your surroundings and describe their range of products	E51	I know businesses in my area… I find knowing businesses in my area…		
K53	How can you analyze a workplace? Name different possibilities.			s53	Researching a place of work…
				S54	Planning a business visit...
K55[4]	Which questions do you ask to get to know the business?				
Unit 6 Business visit					
K61	How do you behave in a practicum?	E61	I can behave appropriately during a work placement… I find behaving appropriately at a work placement…		

K62[4]	Describe a profession. What does one must be able to do in this job?	E62	My knowledge about jobs and careers is… I find knowing about lots of jobs…		
				S63	Contacting adults, I don't know…
				S64	Getting information about a business…
				S65	Being able to note down information about important impressions and experiences…
				S66	Being able to realize myself in an unfamiliar environment…
				S67	Engaging with the working world…
				S68	Engaging with my future career
Sum with the total of all answers Sum of selected questions (9) Sum per unit		Scales ek and er out of 10 items		Spot, simp, spla scales out of 15 items	

[3] Not included in the ek and er scales (rating of scope and relevance of knowledge)
[4] Sum with answers to important questions (9 questions)

3.3.2 Construction of the questionnaire and translations

The questions were translated from German into English, then from English into Romanian whereby two independent translators carried out the translation into Romanian. Differences were discussed and adjusted accordingly. A single translator carried out the Hungarian translation (without a countercheck). The questionnaires in Romanian were tested within two JOBS and two Non-JOBS-students with their teachers (Wave 0).

The questionnaire was issued in three languages (Romanian, Hungarian, German), in parallel versions for JOBS-students and Non-JOBS-students, and for JOBS teachers and Non-JOBS teachers. As the questionnaires were used as a pretest and posttest, a few small adaptations were necessary (questions about the future in the first questionnaire and questions about the past in the second questionnaire).

In all, there are 24 versions (pretest – posttest, JOBS – Non-JOBS, students – teachers = 8 versions, each in three languages = 24 versions). The Romanian coordinator oversaw the correct delivery of each specific questionnaire.

3.4 Data collection

3.4.1 Survey

The first round of questionnaires took place in the school year 2012/2013 (October 2012), the second round at the end of the school year (June 2013). To test effectiveness, at the end of the school year 2013/2014 a second round of questionnaires on possible learning effect was conducted on the control groups, consisting of the same number of classes as in the first round (see Solomon's four-group design). The questionnaires were printed out and passed on to the school in question, whereby the JOBS teachers acted as multiplicators.

3.4.2 Data collection

The teachers of the schools involved in the study returned the questionnaires. The data was then entered as part of the evaluation study by the data collection coordinator of the JOBS RESEARCH study. The incorporation of numeric data was done by means of a data scanner (using the REMARK program); the

answers to the open questions (questions on knowledge, opinions and attitudes) were entered manually (using Excel).

The data from various data sources will be collated in an SPSS file. Colleagues at the University of Brasov (team A) will then process the data further by using inferential statistical methods.

3.5 Data processing and analysis

In the first phase of the evaluation (2013-2015) the collected data is being revised: latent structures are being located and verified by factor analysis, providing an assessment of the extent to which the scales that have been developed and used within the framework of the research project have proven themselves of value (by means of a reliability analysis using Cronbach's alpha test). Following this, differences between the intervention and the control group will undergo a variance analysis and developments will be worked out longitudinally.

In the second phase of evaluation (2015-2017), the value of the learning effect will be examined in terms of the effects of concuring factors (using regression analysis and structural equation models). Individual characteristics will be included and characteristics of the context that - as resources - could promote or prevent developments. Furthermore, familiar and scholastic characteristics will be included, particularly the beliefs and attitudes of the teachers questioned, who have a direct influence on what happens in lessons. In this way, the results on one level (teachers) can be analyzed as concuring factors influencing change on the other level (students).

3.5.1 Teams and tasks

The teams have taken on the following tasks. Team A takes on the main role in this, in as much as all they are entering all data into the SPSS data file, thereby contributing to the final overall analysis. Team A has increasingly grown into its role as a cooperation partner.

Team A: Metric data

The data were analyzed by scientists of the Transylvanian University of Brasov, Department of Psychology, in cooperation with the project leadership team[1]: Dr. Laura Teodora David, Dr. Ana-Maria Cazan and Dr. Camelia Truta.

The following steps has been carried out:

- Data cleansing and verification of distribution

- Building scales after factor analysis (principal component analysis (oblime method) as an independence of factors cannot be assumed, extraction of factors following the Kaiser criteria).

- Variance analyses per instrument: compare intervention and control groups (JOBS – Non-JOBS) per time of measurement t1 and t2 (ANOVA). Multifactorial variance analyses with repeated measurement (GLM) were uses to investigate on longitudinal effects.

- Tests to investigate on learning effects by using the survey twice (Solomon design) by variance analyses on the four Solomon groups time 2: JOBS with pretest, JOBS without pretest, Non-JOBS with pretest, Non-JOBS without pretest.

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[1] Introduction to the study and the theoretical background, further training on data management of larger studies, further training on evaluation processes; contributions of Brasov colleagues by serious training and working on knowledge and proficiency, in particular about the evaluation of the Solomon design and processing the results.

Text data

Content analysis (after Mayring, 2015) of the answers to the open questions, concerning the acquired knowledge (based the teaching and learning materials JOBS), family background and general attitudes towards teaching and learning:

• Team C: Questions on JOBS knowledge

The answers were codified according to factually correct aspects according an inductively elaborated coding guideline. Each factually correct aspect of an answer is graded and multi-facetted answers are thereby codified in multiple approaches.

Seeing as the JOBS classes do not only cover knowledge recall, but also deepening understanding, applying, analyzing from multiple perspectives, finding solutions and evaluating these critically (see the taxonomies of Anderson & Krathwohl, 2001), developing a knowledge test with closed questions and unambiguous assessment criteria was inappropriate. The guidelines for coding the answers of the students and the teachers were developed together with the persons of Team C. This content analysis (Mayring, 2015), in other words the codification according to the developed codification guidelines, were carried out by a group of teachers who are engaged with the JOBS project and are active as moderators: Daniela Felegean, Alina Gavrila and Dorina Draghici.

Open questions bring with them a risk that raters follow their own logic of codification, despite the collective development of the codification guidelines. Despite of training a critical distance as researcher's perspective can be lost sight of (see chapter on difficulties with boundaries).

• Team C: Questions on family background

Students were questioned on the level of their parents' education, career training and job status. The answers were categorized by content analysis and subsequently codified by a coding guideline (team C, the group of JOBS teachers from Brasov). The results of these analyses were entered the dataset.

• Team B: Open questions about basic attitudes and beliefs:

It is planned, that two scientists of the faculty of educational science at the University of Cluj-Napoca will evaluate the textual data. After a lengthy phase of development and testing of a codification guideline with inductive and theory-based deductive categorization systems, the evaluation of these data has started now.

3.5.2 Interviews with students

At the end of the school year 2014/15 and 2015/16, interviews will be conducted to track the further career development of students who took part in the JOBS program and those who did not take part. Students will be selected who differ in terms of their ratings of their JOBS-related skills, the significance of these skills and their enjoyment of exercising these skills. By cluster analysis, 6 types were identified, from which one boy and one girl from a gymnasium and from a technical college each were selected and asked to do the interview.

Based on a interview guidelines, the students will be questioned about their further career plans, about biographical episodes, memories of the JOBS classes and also their ratings of the meaning of the JOBS program. The interviews should give information about how students apply what they have learnt and which opportunities arise for them.

After the collaborative development of the interview guidelines the interviews themselves will be conducted, investigated and evaluated by fellows of the University of Brasov (by team A, including a further scientist).

4 Results of study A – Students

Results are shown in Figures and Tables with comments and interpretations. In the Figures results are shown in histogram, the stars in red point out the significance of the cross-sectional difference between the intervention and the control group, the stars in orange the one related to the significance of the longitudinal development concerning the intervention group, stars in blue would show differences according the development of the control group (but there are no such results).

4.1 Characteristics of person and family context

Family composition

Tab. 6: Family and family members, split into the categories JOBS/Non-JOBS

	JOBS		Non-JOBS		
	quantity	percent	quantity	percent	
without father	52	15.2	48	14.2	
without mother	21	6.2	37	9.4	
with grandfather	53	15.5	47	13.9	
with grandmother	85	24.9	87	25.7	
another person	25	7.3	18	5.3	
siblings 1	114	33.4	115	34	
2	78	22.9	62	18.3	
3	30	8.8	27	8	
4	8	2.3	18	5.3	
5	9	2.6	12	3.6	
6 to 11	10	3	12	3.6	
family total 1	1	0.3	3	0.9	
2	15	4.4	20	5.9	
3	81	23.8	75	22.2	
4	111	32.6	111	32.8	
5	64	18.8	55	16.3	
6	25	7.3	26	7.7	
7 to 12	28	8.2	34	10.1	

The sample groups of JOBS and Non-JOBS neither differ in terms of family composition nor in terms of family size and number of siblings (see *Table 6*).

4.2 JOBS subject-specific knowledge and skills

4.2.1 Content knowledge JOBS, related on teaching and learning materials

The evaluation of the data gathered by content-analyzes has proven to be complex and multi-layered and accompanied by various difficulties. Even though an instrument was created to test subject knowledge JOBS with which knowledge could be recorded objectively, the gathered data cannot really be seen as valid. This instrument was tested in a pretest with the two first JOBS classes and two Non-JOBS classes in June 2012. The answers of the students are very poor, sometime one word or blank. It can be assumed, that they did not write all they know. It is not clear if the test itself was perceived as a challenge and to what extent the evaluation can count as reliable. A critical examination of the illustrated results follows at the end of this chapter.

The students' answers were categorized according the methodological approach of content analysis by the team C. As the questions are open questions regarding knowledge that can be answered correctly in more than one way, multiple codifications of answers are possible. Results were added as sums per question, unit and in total. They include the explicit part of knowledge, but not the tacit knowledge that is relevant for acting as well.

The data resulting from this content analysis were entered into the SPSS dataset and processed further by team A (scientists at the University of Brasov). The sums are being investigated by variance analysis (ANOVA) in terms of differences between the intervention and control groups and in terms of developments.

JOBS program has a significant effect on the learning outcome of the students. But the results cannot be interpreted unambiguously. The expected effect that students participating in the JOBS program would have distinctly more JOBS-related knowledge than those who did not take part in the JOBS program is statistically significant, but the difference between the groups is little. The following results give an insight:

The differences in the sums of the points scored in all 17 questions are shown in *Figure 8*.
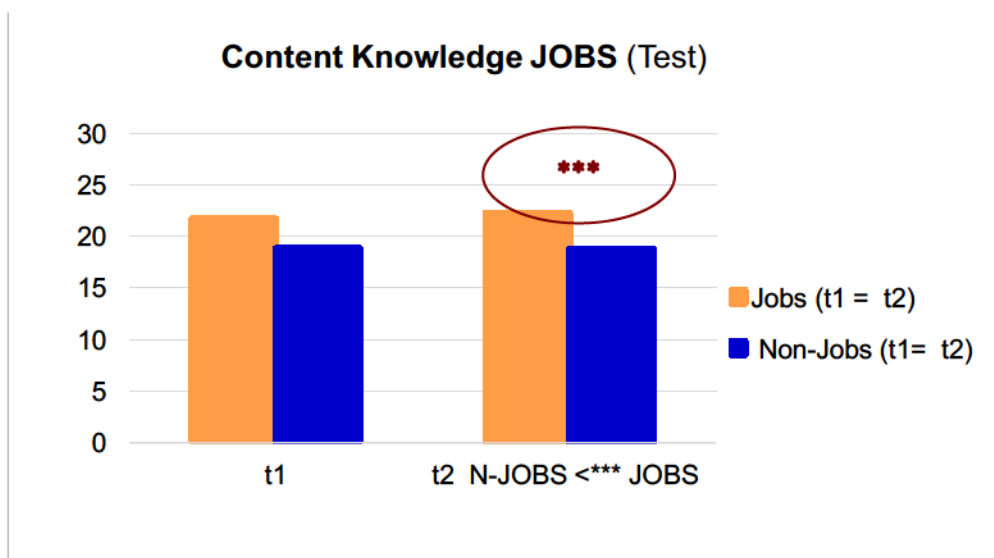

Fig. 8: Content knowledge JOBS by intervention and control groups: sums over all questions, with results of variance analysis (groups and times)

The analyzes on knowledge indicate a statistically significant increase in knowledge amongst the group of JOBS students at the end of the school year as opposed to the Non-JOBS group. The difference is slight (a few value points), but with high statistical significance (possible error on a level .001 percent).

→ Regarding the low differences between the intervention and control groups the following questions arise: To what extent did the students accepted the test situation (in the context of answering the questionnaire) as a challenging requirement? Did the test with open questions fit to the students' willingness to answer? Are they lacking of skills necessary to express themselves to answer open questions by writing?

To test this in the further phases of the study, the students' end-of-year marks in the subjects Romanian and Mathematics will be obtained. Based on the marks we gain information about their level of school success and on their linguistic competence. By comparing the data on the knowledge questions between high achieving and low achieving students, we hope to get a clarification of these results to enable a sustainable and acceptable interpretation.

In the second step, the attitude to answering questions was tested. For this purpose, the frequency of respondents per question was set out in *Figure 9* (t1, before the intervention) and *Figure 10* (t2, after the intervention).

At the beginning of the JOBS intervention program, a higher (statistically insignificant) sum of answer points can be detected amongst the JOBS students (intervention group) than amongst the Non-JOBS students. The lessons had begun one month before, so JOBS students know already better what JOBS will deal on. A comparison of the results based on unit 1 of the textbook (questions k11 and k12) shows no significant difference between the intervention and the control group. This despite the fact that at the time of questioning, the unit and thereby the questions had largely been worked through. We can deduct from this that the reason for the larger number of JOBS students having given more answers to questions than Non-JOBS students shows a greater *willingness* to answer, explained by a greater extent of acquired knowledge and higher motivation to show it.

The difference between the groups visible in *Figure 9* is statistically insignificant. The intervention group and the control group do not differ: they start the school year at the same level in terms of the JOBS-related knowledge, which is a thoroughly plausible deduction.
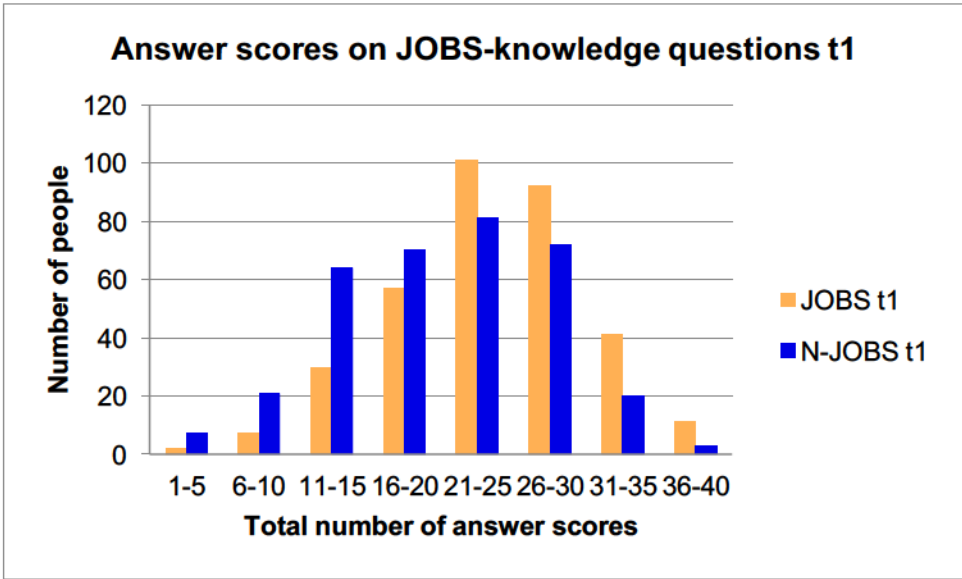

Fig. 9:   Frequency of participants (and the amount of their achievement scores), completed the survey at the start of the school year: intervention and control group

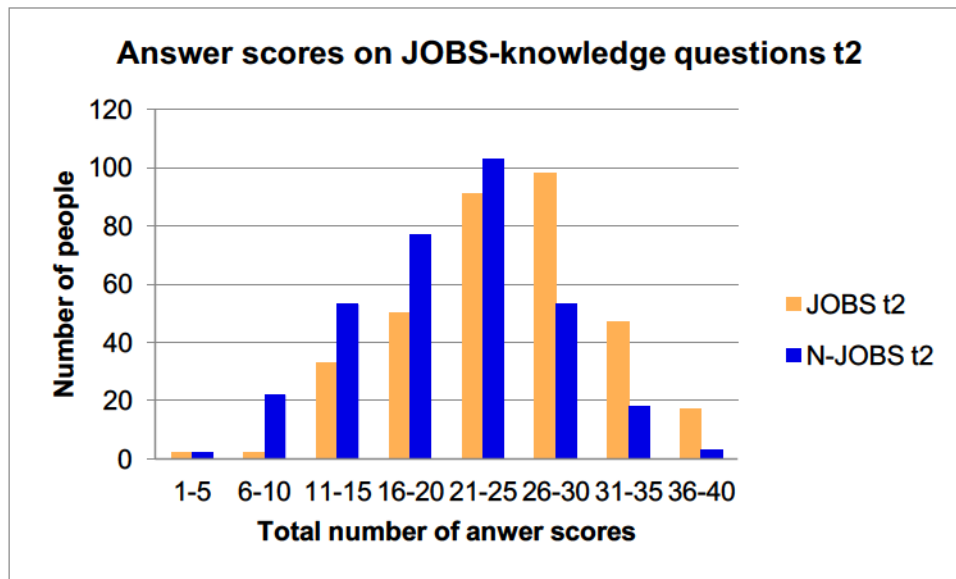**Answer scores on JOBS-knowledge questions t2**

Fig. 10: Frequency of participants (and the amount of their achievement scores), completed the survey at the end of the school year (after the JOBS intervention): Intervention and control group

The results of the knowledge test at the end of the school year show an aggregate value for JOBS students slightly (but not statistically significant) above the values indicated for Non-JOBS students (see *Figure 10*). Viewing the spread of frequency of occurrence represented in *Figure 10* a slight shift to the right is visible. A shift towards a higher value can be detected. However, the difference is minimal – we must not assume that the given values reflect the knowledge of the students in a valid way. Tacit knowledge, relevant for mastering requirement of working world, cannot be evocated by a test. The potential the built up with JOBS program cannot be identified.

With the next step the behavior concerning answering questions is focused on non-answers. The results are depicted in *Figure 11* and *Figure 12*.

Non-answers to questions on JOBS-based knowledge t1
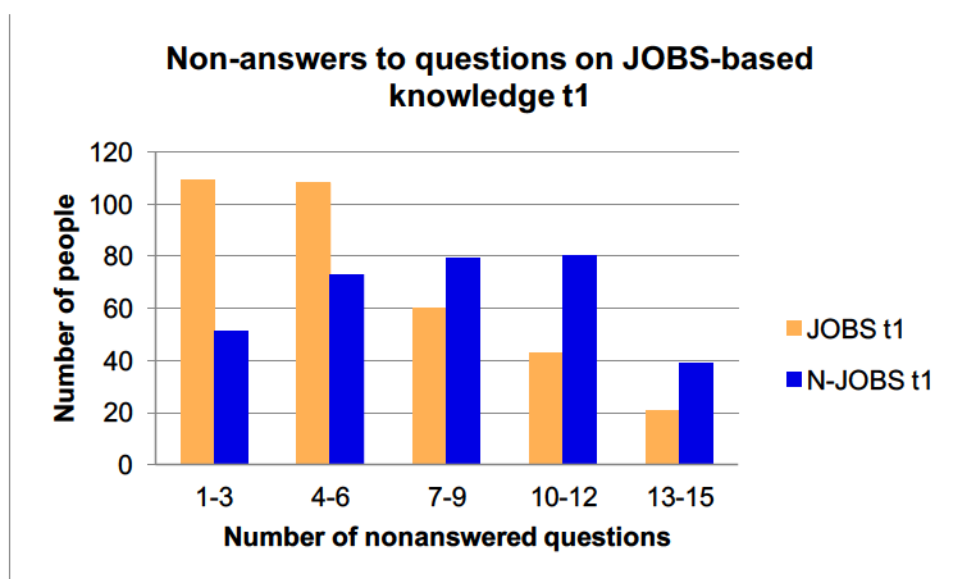
Fig. 11: Frequency of non-answers (empty, 'I don't know' or unfitting responses), by intervention and control groups at the beginning of the intervention program (t1).

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"Non-answers" include responses that fall into the category "I don't know", empty panels and answers that don't fit the question.

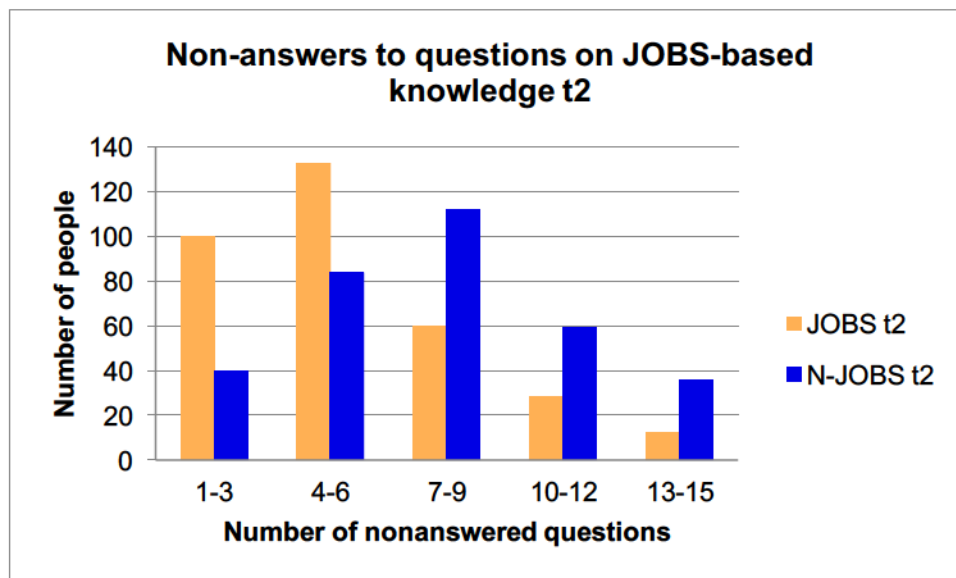**Non-answers to questions on JOBS-based knowledge t2**

Fig. 12: Frequency of non-answers (empty, I don't know or unfitting responses), by intervention and control group at the end of the intervention program (t2)

The number of students who did not give answers either at the beginning or at the end of the intervention is smaller amongst the group of JOBS students than amongst the group of Non-JOBS students (see *Figure 11* and *Figure 12*). In total, Non-JOBS students didn't answer more often than JOBS students. JOBS students were better motivated to answer the questions.

Critical evaluation of the results of the knowledge test

1) Problem of reliability: The coworkers of team C as non-scientists had to learn the method Content Analysis (Mayring, 2015), using the coding guideline for the JOBS RESEARCH project to analyze the 17 questions on knowledge of the approximately 1800 students. After collaboratively developing the codification guideline and discussing initial experiences that arose following the content analysis (during two workshops: one in May 2013, the other in May 2014), the coworkers of project team C began to analyze the data. In the first phase, they analyzed the first 50 datasets collaboratively, to discuss and come to an agreement on each ambiguity and each uncertainty. In the second phase, 50 further datasets were each codified. The results were collated and discussed collectively to clarify uncertainties and inconsistencies anew. Following the process of evaluation, examples should be continuously adduced if new facets of a particular category are shown in the form of answers. After a third work phase, an analysis followed that was conducted by division of labor. Questions and ambiguities were discussed and clarified in the workshop in May 2014. To verify the reliability of the results, a re-analysis would be necessary.

Despite the collaborative development of the coding guideline, training of non-scientific coworkers, the communicative validation of inter-rater reliability and the discussions on the results of the analyses in workshops, it has not been possible to conduct this content analysis in a reliable way. The critical distance to the data (answers of the students), necessary in research studies, could not be hold continuously. Teachers of team C were involved in the perception of their students. For example, the question "How

do you *plan* an interview?" (K11) showed, that the raters did code also answerers about *carrying out* an interview (instead of planning), which was not mentioned in the categories of the coding guideline. The teachers of team C told us "We know, how our students think, and they think like that!" Taking on a distanced researcher perspective was apparently very difficult for the non-scientific coworkers of team C, involved and engaged as important partners in JOBS project.

2) Problem of validity: Whether the test really measures what was supposed to measure remains uncertain. The instruments to collect acquired knowledge worked on in JOBS lessons based on the teaching and learning materials JOBS (see *Table 5*, first and second column) aims to collect knowledge in an objective way. It remains unclear to what extent the acquired knowledge has been retained as *explicit* knowledge that can be recalled when answering test questions, or whether it has been integrated as competencies into subjective thought patterns, not explicable but applicable to deal with requirements in future situations of working world (see chapter 2.1 and Neuweg, 2014).

- The learning setting of JOBS classes orientate themselves towards students' acquisition of competencies and skills, in other words towards an ability to analyze, synthesize and evaluate situations to generate their own solution pathways. Therefore, the learning setting of JOBS classes aim towards more complex goals than merely a recall of discreet factual, subject knowledge (see also Andersohn & Krathwohl, 2001). Based on this it can be assumed, that the instrument for recording knowledge results in recording only factual knowledge, but does not successfully measure the acquisition of *competencies*, the intervention program JOBS aims to.

According to the basic conception of the teaching and learning materials of JOBS program and the type of knowledge gathered by testing acquired knowledge, the unexpected result in terms of the sum of points gained by answering the open questions could be caused by the fact, that students were not able to recall factual knowledge as the explicable part of that they have learnt with the JOBS program.

- The implemented learning setting by JOBS program allow students to work on various issues discursively and to apply the competencies gained by working on tasks related to concrete situations of the working world. In this setting, *testing* knowledge within the scope of the JOBS classes is not intended by the JOBS program. As most students in both groups merely gave one worded answer per question, instead of writing as much as they know about a question, we can assume that *they did not recognize the characteristics of the questions that should have facilitated multiple responses* and instead stuck to their one-word answers. The students therefore did not fully made use of and engaged their capacity to answer questions according to their capacity. During lesson observations of subject specific lessons, we gained an exemplary insight in the working practices of the teachers. The dialogue opportunities between teachers and students usually followed a pattern of question-and-answer, whereby students usually gave one-worded answers to the questions posed by the teacher.

Students must be fostered to explain themselves and not to be remain in a word-by-word conversation. Even if teachers in the JOBS classes were in a position to apply a range of interactive lesson structures and methods, students themselves were not used to contribute to the lesson in an interactive way and to give nuanced and thorough responses to questions that were asked. It is most probably this "not being used to" that is reflected in the short responses to the open questions of the questionnaire. The possibility of answering questions with multiple statements, whether in the form of lists, exemplifications or explanations of answers, thereby demonstrating one's own potential, was hardly used. The fact that the answers had to be written down could have also presented respondents with a further barrier.

- The high number of non-answers (no answer, "I don't know" answers or answers that do not fit the question) could indicate perhaps, that the way the questions were asked, did not stimulate respondents to engage in a multifaceted mode of thinking and remembering or that students did not engage themselves to respond to questions in a differentiated, explicative and thoughtful way.

Summary:

These results show a significant effect of the JOBS program on gathered knowledge of JOBS students. The difference is little, but statistically significant on a high level (with possibility of error on the 0.1% level). At the end of the intervention JOBS participant students perform more knowledge than the students of the Non-JOBS control group. But referring to other studies on acquired knowledge by intervention programs with practical learning situations (see Klemenz, König, Rothland & Tachtsoglou, 2015), the increase is in a similar extent. The difference between JOBS and Non-JOBS results is significant but small. There is an effect on the learning outcome, but the results must be discussed focused on further perspectives.

• JOBS-based knowledge relies on in-context activation. In the absence of a topic-oriented, contextual basis, an activation of knowledge – or rather of competencies as potential for the handling of requirements - is not possible: separated from context, knowledge is not accessible and explicable.

• The students are not used to accept open questions and to answer these in more than one word or explaining different aspects.

• The coding guideline is not explicit enough to reliably coding factually correct answers that are based on the questions.

• The engaged and non-scientific raters could not be schooled sufficiently to assign their answers according to the specified categories reliably. Capacity building needs basic competences as scientific researcher.

• The raters were too involved in the experience of "work with students". In other words, it was difficult for them to take a step back and go into the distance, necessary for scientific analyses. They need to assume a critical distance to categorize the answers of the respondents reliably according to the contents of the text they wrote, rather than trying to interpret what they imagine students were thinking.

→ Consequences: in the second wave of the survey it is clearly emphasized that students should write down everything that they know.

→ Re-analysis would be necessary to test the reliability of the results (a generally used approach in scientific research). But, due to the very small number of answers per questions it would not be worth to do so.

→ By comparing the data on the knowledge questions between high achieving and low achieving students, we hope to come to a better understanding and clarification of these results. By comparison between the results of high-achieving and low achieving students (group allocation according to end-of-year marks), we hope to know more about the skills of the students, necessary to express themselves in writing when answering open questions.

These results can also point out the difficulties to evaluate competencies an intervention program is focused on. To measure knowledge by tests is not a reliable way to evaluate effect of an intervention program, focused on competences, shown in action.

4.2.2 Rating of knowledge concerning JOBS content and its relevance
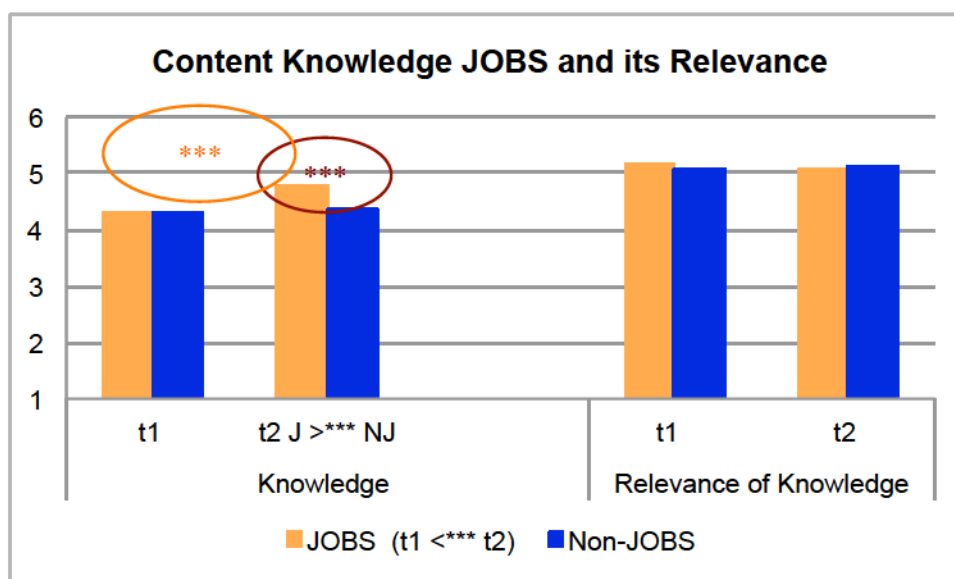

Fig. 13: Content knowledge JOBS and the relevance of this knowledge, by JOBS and Non-JOBS students

Students of JOBS classes rate their knowledge as adequate, estimated by self-assessment of their JOBS-related knowledge based on the teaching and learning materials, assessed by textbook-based questions (see *Table 5*). The mean of the estimations is in the upper half of the scale. At the start of the school year there is no significant difference between the intervention and the control group; at the end of the school year, JOBS students rate their knowledge significantly higher than the students from the control group (see *Figure 13* and *Table 7*).

Tab. 7: Content knowledge JOBS and its relevance; mean (M) and standard deviations (SD), variance analysis, time t1 and t2 and repeated measurement, by intervention group (J) and control group (NJ)

	t1			t2			t1-t2	
	J M/SD	NJ M/SD	ANOVA	J M/SD	NJ M/SD	ANCOVA	J GLM	NJ GLM
Knowledge [1]	4.32/ .84	4.31/ .89	n.s.	4.80/ .75	4.36/ .78	J> NJ***	t1< t2***	n.s.
Relevance [2]	5.15/ .68	5.06/ .75	n.s.	5.04/ .82	5.08/ .72	n.s.	n.s.	n.s.
[1] Main effect of knowledge J > NJ*** F(1,1619) = 30.46, p < .001, η^2 = .03; Solomon n.s.								
[2] Main effect of relevance of knowledge J / NJ F(1,1654) = 3.04, p = .08, η^2 = .002; Solomon n.s.								

Concerning the relevance of knowledge, both groups reveal high values both at the beginning and at the end of the school year. There is no significant difference between the two groups. At the beginning and at the end of the school year, students rate competencies about responding to the demands of the working world and about their knowledge about their own strengths and interests – tested by textbook-based questions – as very useful, meaningful and valuable.

The correlations between knowledge and relevance of knowledge (*Table 8*) show moderate positive correlations, in terms of progression over time and between the extent of the knowledge and its relevance. A strong correlation between the extent of knowledge and its relevance is evident in the intervention group at the end of the school year. It appears that the ratings of relevance of knowledge and the extent

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of knowledge are influenced by each other. In contrast, there is a very weak correlation between the extent of knowledge at the beginning of the school year and the rated relevance of this knowledge at the end of the school year.

Tab. 8: Correlations (Pearson) between the extent and relevance of knowledge concerning JOBS contents

		Relevance of knowledge (10)	
Extent of knowledge (scale with 10 items)	Point in time	t1	t2
JOBS	t1	.459***	.131*
	t2	.407***	.680***
Non-JOBS	t1	.577***	.301**
	t2	.359***	.570***

Summary:

• At the end of the school year, the participants of JOBS classes rated their knowledge regarding the working world significantly higher than at the beginning of the school year. Their ratings were also significantly higher than those of the students who had not taken part in the JOBS program, given a similar starting point in terms of the ratings made by both groups at the start of the school year.

→ JOBS classes can be judged as effective for knowledge acquisition, evaluated by self-assessment of the students.

→ This knowledge, transmitted by JOBS program, is deemed meaningful, valuable and desirable, as recognized by JOBS students and Non-JOBS students alike, independent of the group they were assigned to.

→ The extent of knowledge and its relevance are mutually interdependent, in particular in the JOBS classes at the end of the school yea, in other words, at the end of the intervention and followed by a significant increase in knowledge (see *Figure 8*). With increasing knowledge, the level of its significance increases as well and vice-versa (see *Table 8*): with the increasing recognition of the relevance of the knowledge worked on in the JOBS lessons, the level of knowledge itself increases also. Therefore, the attitude that knowledge regarding the working world is relevant, useful and desirable contributes considerably to the development of knowledge.

4.2.3 Rating of skills concerning JOBS, its relevance and the emotional component in practicing them

Skills to be acquired during the JOBS program were surveyed from multiple perspectives. On the one hand, the focus was on assessing the *extent* of the particular skills (… can I …, competence), the significance or value of this skill (…I find important…, relevance) and also the degree of emotional involvement in engaging in this skill (…I enjoy doing…, valence). The results of the ratings of these three perspectives are shown in *Figure 14* and *Table 9* according to intervention and control group.
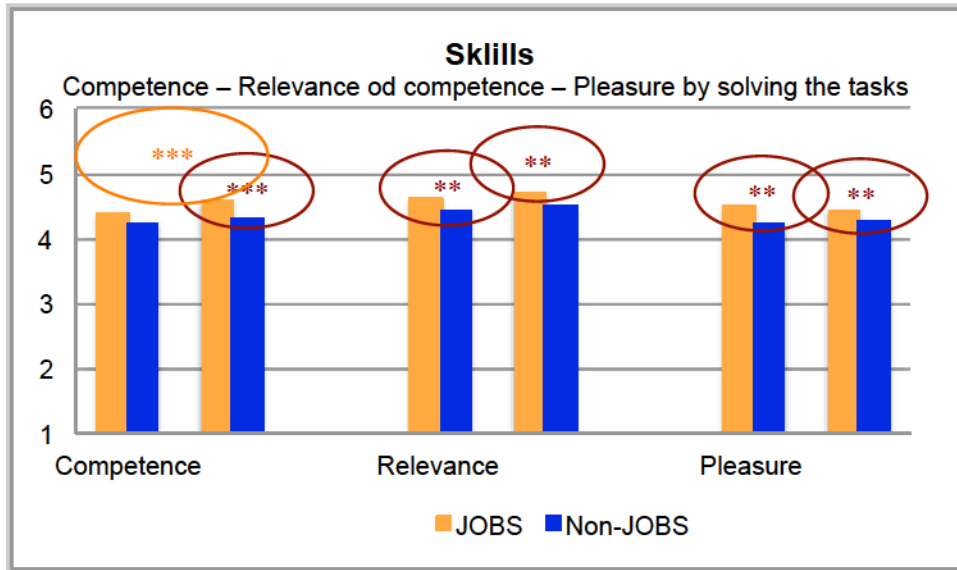
Fig. 14: Competence, relevance and valence of JOBS-based skills, by intervention group (JOBS) and control group (Non-JOBS)

The intervention group JOBS shows a highly significant increase of competence according to skills in comparison to their ratings at the beginning of the school year. From the perspective of JOBS students, they are much more able to show the skills that are dealt with in the units of the JOBS teaching and learning materials at the end of the school year.

A comparison between the intervention group JOBS and the control group Non-JOBS at the beginning and at the end of the school year shows significant differences concerning the ratings of relevance and valence of JOBS-based skills. JOBS-students rate the relevance of the skills and their enjoyment in the engagement in working on the activities based tasks (valence) t higher than Non-JOBS students do.

Already at the beginning of the course (the survey took place after some weeks of experience), taking part, experiencing and being involved in JOBS classes lead to an incensement of the relevance of the skills to be acquired and of the estimation of enjoyment by doing the textbook-based activities. An effect of JOBS program is visible already after some weeks.

Tab. 9: Skills, based on teaching and learning materials: competence, relevance and valence; means (M) and standard deviations (SD), variance analysis time t1 and t2 and repeated measurement, by intervention (J) and control group (NJ).

	t1			t2			t1-t2	
	J M/SD	NJ M/SD	ANOVA	J M/SD	NJ M/SD	ANCOVA	J GLM	NJ GLM
Competence	4.39/ .98	4.24/ .94	n.s.	4.57/ .89	4.43/ .91	NJ > J***	t1 < t2***	n.s.
Relevance	4.62/ 1.03	4.43/ 1.03	NJ < J **	4.67/ .93	4.49/ .99	NJ < J**	n.s.	n.s.
Valence	4.48/ 1.07	4.24/ 1.03	NJ < J **	4.43/ 1.02	4.26/ 1.05	NJ < J***	n.s.	n.s.
Competence: $F_{(1,1552)} = 35.919$, $p < .001$, $\eta^2 = .023$, Solomon n.s.								
Relevance $F_{(1,1581)} = 23.923$, $p < .001$, $\eta^2 = .015$; Solomon n.s.								
Valence $F_{(1,1578)} = 12.913$, $p < .001$, $\eta^2 = .008$; Solomon n.s.								

Concerning the correlations between competence, relevance and valence both groups show high and significant correlations at the beginning and the end of the school (see *Table 10*). The groups do not differ from each other in this respect.

Amongst the JOBS intervention group, the correlations are less strong, if one analyses the data in terms of longitudinal connections.

The results show that the students differentiate very little between the skills, the significance of these skills and the enjoyment of carrying out the corresponding tasks.

These findings can be read in the two following ways:

• It could be, that the data are not very valid, in other words students hardly differentiated between the different perspectives in their answers, instead they stuck to the content of the question and did not add to it, which could have led to a smaller differentiation between these areas.

• The findings indicate that to contribute to the development of competencies, various avenues can be taken. Even by means of enjoyment can competence experience be strengthened, which in turn can facilitate the recognition of relevance and strengthens the experience of competence in specific skills.

Compared to the high correlation, the lower level in terms of longitudinal correlation indicates that during a school year, developments and changes can arise that are not determined by the initial ratings at the commencement of the school year, but can only be connected to these ratings up to a certain point. During the school year, it was possible – particularly in the intervention group – for new or shifted accentuations in relation to competence in a skill, relevance and valence to arise.

Tab. 10: Longitudinal and cross-sectional correlations between competence, relevance and valence of JOBS-related competencies, by intervention group and control group

			t1			t2		
			Compe-tence	Rele-vance	Va-lence	Compe-tence	Rele-vance	Va-lence
JOBS	t1	Compe-tence	1	.769***	.776***	.467***	.396***	.463***
		Relevance	.769***	1	.859***	.474***	.435***	.456***
		Valence	.776***	.859***	1	.512***	.446***	.529***
	t2	Compe-tence	.467***	.474***	.512***	1	.850***	.828***
		Relevance	.396***	.435***	.446***	.850***	1	.806***
		Valence	.463***	.456***	.529***	.828***	.806***	1
Non-JOBS	t1	Compe-tence	1	.824***	.805***	.645***	.520***	.592***
		Relevance	.824***	1	.850***	.597***	.674***	.621***
		Valence	.805***	.850***	1	.583***	.568***	.619***
	t2	Compe-tence	.645***	.597***	.583***	1	.785***	.806***
		Relevance	.520***	.674***	.568***	.785***	1	.823***
		Valence	.592***	.621***	.619***	.806***	.823***	1

4.2.4 Knowledge and interest in the working world and in own abilities and aptitudes

Students were questioned on their knowledge in the main domains (working world, their own strengths and interests) that were focused on during the JOBS lessons independently of the questions drawn from the teaching and learning materials (see *Table 5*). Seen in terms of motivational psychology, the acquisition of knowledge is strengthened by interest. For this reason, students were asked not only about their knowledge regarding the working world and regarding their own strengths and interests, but also about

their interest in knowledge about the working world and about their own strengths and interests. As these four questions connect to different areas, they were evaluated as single items.

Figure 15, illustrates the frequency of the values occurring in the different fields, separated into JOBS and Non-JOBS groups at the beginning and at the end of the school year. *Table 11* shows the results of the variance analysis. The results can be read as follows:

At the start of the school year, the students of the intervention group and the control group's level of knowledge lay in the range of the mean of the scale of 1 = a little to 6 = a lot. Knowledge about their own strengths and interests were rated at a high level; the mean value of ratings of interest in gaining knowledge about the working world is somewhat lower. The highest values are apparent in interest in getting to know one's own strengths and interests. At the start of the school year, in other words prior to the JOBS intervention, there is no detectible difference to be seen between the intervention group and the control group in the extent of their knowledge about the working world and about their own strengths and interests, and neither is there any detectible difference in the occurrence of interest in knowledge about strengths and interests.
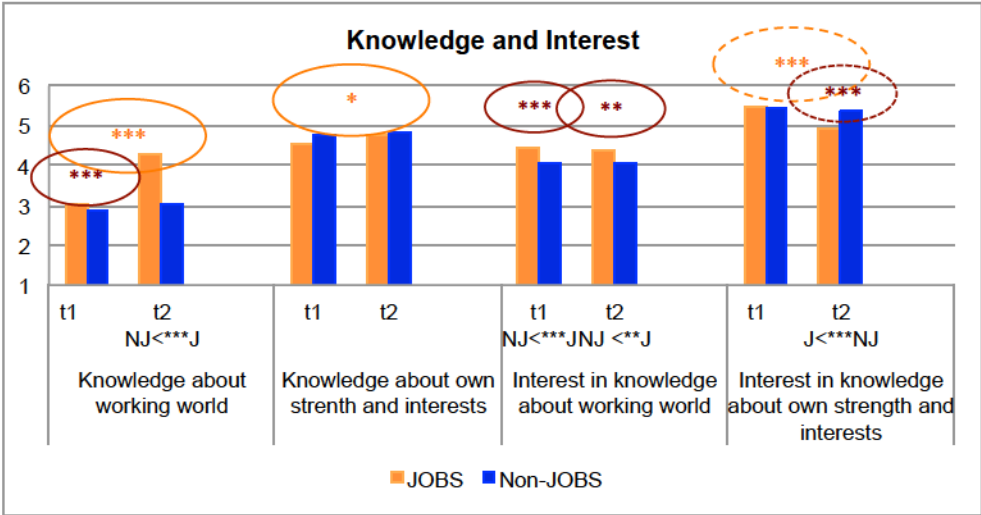
Fig. 15:   Knowledge about the working world, own strengths and interests and its' relevance

The students in the JOBS group show significantly higher scores in knowledge about the working world at the end of the year (see *Figure 15*). This increase is not only statistically significant, but also striking. The area of knowledge about one's own strengths and weaknesses shows a slight, yet statistically highly significant increase. The degree of interest in the working world remains at the same high level, the very strongly defined interest in one's own strengths and weaknesses shows a statistically highly significant decrease in the group of JOBS students (the striped ellipse indicates the mean value). In the control group who did not take part in JOBS classes, no changes can be found.

→ The JOBS classes show that from the viewpoint of the students, there is a very strongly defined effect on the extent of knowledge about the working world and a slight, but still significant increase in knowledge about own strengths and interests – with a constant development of interest about knowledge about the working world and with a sinking interest in knowledge about one's own strengths and weaknesses.

Tab. 11: Knowledge of the working world (Eval 1), own strengths and interests (Eval2), interest to know more about the working world (Eval3) and interest in learning more about their own strengths and interests (Eval 4); means (M) and standard deviations (SD), variance analysis time t1 and t2 and repeated measurement, by intervention and control group

	t1			t2			t1-t2	
	J M/SD	NJ M/SD	ANOVA	J M/SD	N_J M/SD	ANCOVA	JOBS	NJ
Eval1	3.03/ 1.43	2.85/1.45	n.s.	4.2871.31	3.05/1.35	J > NJ ***	t1 < t2 ***	n.s.
Eval2	4.54/ 1.31	4.75/ 1.34	n.s.	4.78/1.14	4.84/1	n.s.	t1 < t2 *	n.s.
Eval3	4.47/ 1.63	4.06/ 1.75	J > NJ ***	4.41/1.5	4.08/1.71	J > NJ **	n.s.	n.s.
Eval4	5.47/ .099	5.43/ 1.1	n.s.	4.95/1.21	5.3971.05	J < NJ ***	t1 > t2 ***	n.s.

Eval 1: How much do you know about the working world? Eval 2: How much do you know about your own strengths and weaknesses? Eval 3: How great is your interest to know more about the working world? Eval 4: How great is your interest to know more about your own skill sand interests?

The values are very widely spread (SD > 1), this indicates great inter-individual differences (see *Table 11*).

Tab. 12: Correlation between students' knowledge of the working world (Eval 1), strengths and interests (Eval2), interest to know more about the working world (Eval3) and their learning about own strengths and interests (Eval 4), by intervention and control group

group		Eval1_1	Eval2_1	Eval3_1	Eval4_1	Eval1_2	Eval2_2	Eval3_2	Eval4_2
JOBS	Eval1_1	1	.307**	.342**	.121*	.191**	.167**	.212**	.212**
	Eval2_1	.307**	1	.185**	.316**	0.103	.132*	0.057	.168**
	Eval3_1	.342**	.185**	1	.356**	.349**	.228**	.489**	.278**
	Eval4_1	.121*	.316**	.356**	1	.341**	.198**	.250**	.320**
	Eval1_2	.191**	0.103	.349**	.341**	1	.496**	.646**	.508**
	Eval2_2	.167**	.132*	.228**	.198**	.496**	1	.408**	.585**
	Eval3_2	.212**	0.057	.489**	.250**	.646**	.408**	1	.530**
	Eval4_2	.212**	.168**	.278**	.320**	.508**	.585**	.530**	1
Non-JOBS	Eval1_1	1	.113*	.304**	0.058	.416**	.114*	0.108	.171**
	Eval2_1	.113*	1	0.024	.281**	0.097	.424**	-0.01	.186**
	Eval3_1	.304**	0.024	1	.145**	.125*	0.047	.327**	.109*
	Eval4_1	0.058	.281**	.145**	1	0.019	.167**	0.022	.309**
	Eval1_2	.416**	0.097	.125*	0.019	1	.252**	.328**	.129*
	Eval2_2	.114*	.424**	0.047	.167**	.252**	1	0.029	.288**
	Eval3_2	0.108	-0.01	.327**	0.022	.328**	0.029	1	.182**
	Eval4_2	.171**	.186**	.109*	.309**	.129*	.288**	.182**	1

_1 means time 1 at the beginning of the school year, _2 means time 2 at the end of the school year

The correlations between the various ratings (*Table 12*) show weak coefficients at the *beginning* of the school year in both groups. With focus on the values at the *end of the school year*, the students of the JOBS group show significantly stronger correlations in comparison to the control group.

→ Increasing knowledge appears to be accompanied by increasing interest, in other words, knowledge and interest are interdependent.

→ JOBS lessons that also strengthen the interest of the learners regarding the course content leads to better results.

→ The task-based approach to content strengthens the interest in the topics.

→ According to these findings, increasing interest and increasing knowledge are mutually dependent.
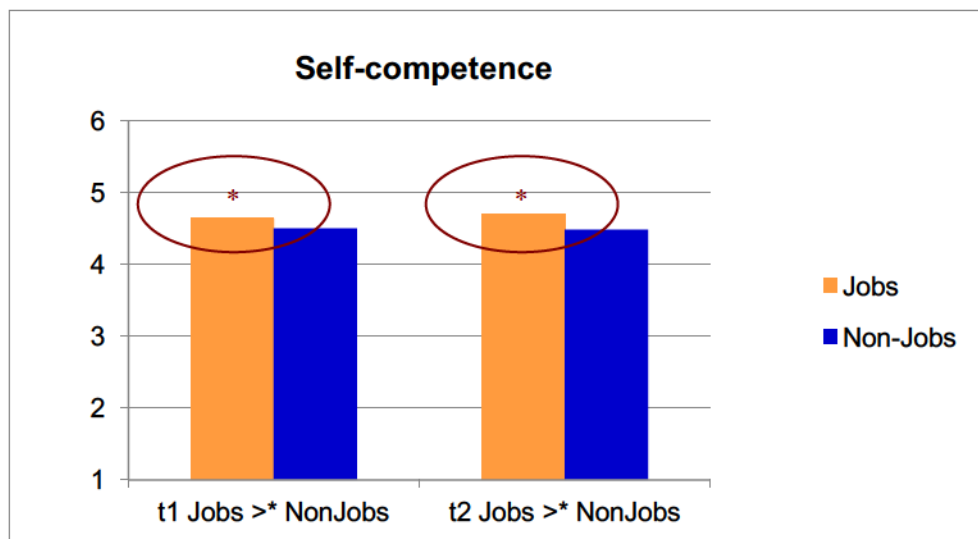
4.3 Self-competence

Fig. 16:   Students' self-competence at the beginning and at the end of the school year

The self-competence was tested by the following questions: I can concentrate well, I do my work conscientiously, I can persevere well, I can work well with others, my school performance is good. These five questions were compiled to make a scale (a factor analytical test proves them to be one-dimensional).

The students of the intervention group scored their self-competence at the start of the school year as higher than students of the control group (see *Figure 16*). The mere fact of knowing that these skills are given recognition and value within the framework of the JOBS classes could have contributed to the fact that students themselves value these competencies more.

5 Results of study B – Teachers

5.1 Knowledge and skills of the students: teachers' ratings

5.1.1 Knowledge

The JOBS-based knowledge of the teachers was not surveyed, so as not to have the effect of initiating a reactance response towards the study and the project.

5.1.2 Ratings of students' knowledge and their significance from the perspective of teachers
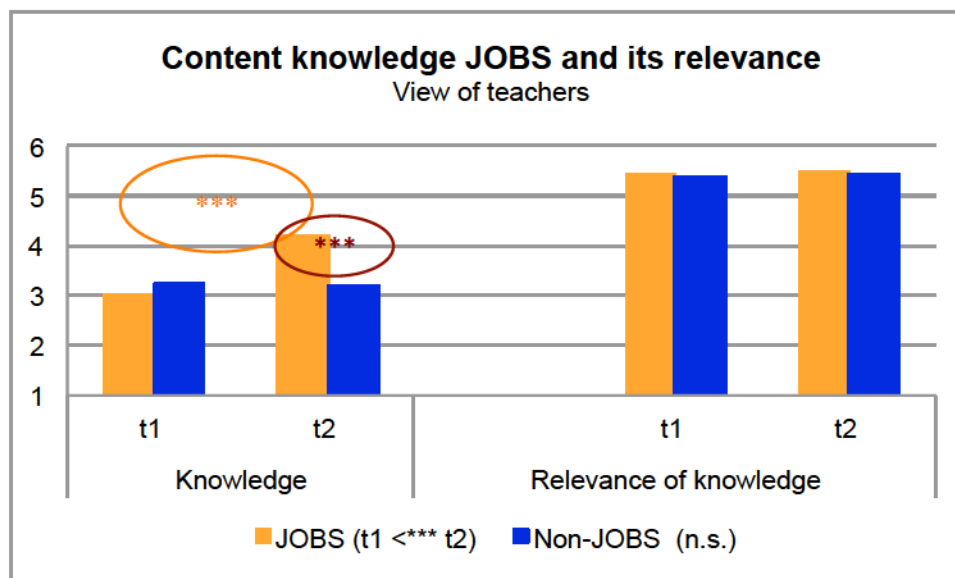
Fig. 17: JOBS-related knowledge of students, from teachers' perspective, by JOBS and Non-JOBS classes

According to the ratings of the teachers, there was a significant increase in *knowledge* that are imparted in the JOBS lessons amongst students of the intervention group. There is no noticeable development in the control group (see *Figure 17* and *Table 13*).

The ratings of *relevance of knowledge* from the perspective of the teachers show no difference over time. The JOBS and Non-JOBS teachers alike esteem the JOBS-based knowledge content as very important. The mean values are very high with no significant difference.

Tab. 13: Students' competencies and the relevance of these competencies from the teachers' perspective

	t1			t2			t1-t2	
	J M/SD	NJ M/SD	ANOVA	J M/SD	NJ M/SD	ANCOVA	J GLM	NJ GLM
Knowledge [1]	3.04/.77	3.22/ .81	n.s.	4.18/.81	3.19/ .90	J > NJ ***	t1 < t2 ***	3.04/ .77
Relevance [2]	5.43/.50	5.40/ .52	n.s.	5.48/ .50	5.46/ .57	n.s.	n.s.	5.43/ .50
[1] Main effect J > NJ *** F(1, 264) = 30.46, p <.001, η^2 = .104; Solomon n.s.								
[2] Main effect J / NJ F(1, 264) = .052, p = .820 , η^2 < .001; Solomon n.s.								

The correlations between the competencies of the students and the relevance of these competencies that the teachers ascribe to them (see *Table 14*) particularly strong connections between the relevance of the competencies to be acquired in the longitudinal progression become apparent. However, there are only

weak connections between the students' knowledge and the relevance of this knowledge as rated by the teachers. These are more pronounced in the intervention group and become progressively stronger during the school year.

Tab. 14: Correlation (Pearson) between students' knowledge and the relevance of their knowledge on JOBS content, from the teachers' perspectives

			Knowledge		Relevance of knowledge	
			t1	t2	t1	t2
JOBS	Knowledge	t1	1	.341**	0.173	.218*
		t2	.341**	1	0.141	.319**
	Relevance	t1	0.173	0.141	1	.601***
		t2	.218*	.319**	.601***	1
Non-JOBS	Knowledge	t1	1	.305*	.228*	0.056
		t2	.305*	1	-0.087	0.129
	Relevance	t1	1	-0.087	1	.640***
		t2	0.056	0.129	.640***	1

5.1.3   Skills: Competence, Relevance and Valence
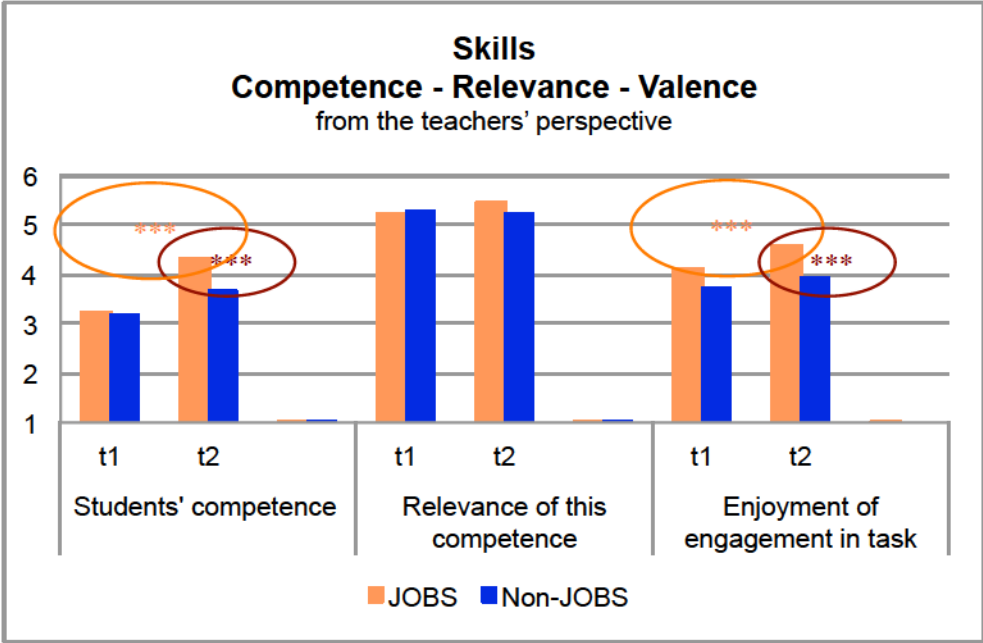
Fig. 18:   Students' skills by the teachers: Competence, its' relevance and the students' enjoyment in carrying out the task-based activities

According to the rating of teachers (see *Figure 18* and *Table 15*), the competence regarding the skills of the students in the intervention group increased noticeably. An increase can also be seen in the enjoyment of engaging in task-based activities as laid out in the teaching and learning materials amongst the students of the intervention group. No significant changes can be seen amongst the control group. No significant changes can be identified in the rating of relevance.

Tab. 15: Students' skills: Competence, its relevance and the valence of carrying out activities based on the teaching and learning materials

	t1			t2			t1-t2	
	J M/SD	NJ M/SD	ANOVA	J M/SD	NJ M/SD	ANCOVA	J GLM	NJ GLM
Compe-tence	3.22/ .96	3.20/ 1.06	n.s.	4.30/ .90	3.66/ 1.22	J > NJ ***	t1 < t2 ***	n.s.
Relevance	5.25/ .78	5.27/ .66	n.s.	5.47/ .58	5.27/ .66	n.s.	n.s.	n.s.
Valence	4.12/ .94	3.71/ .89	n.s.	4.59/ .73	3.91/ 1.16	J > NJ ***	t1 < t2 ***	n.s.
Competence: $F(1, 258) = 17.52$, $p < .001$, $\eta^2 = .064$, Solomon n.s.								
Relevance: no significant main effect; Solomon n.s.								
Valence: $F(1, 254) = 12.19$, $p = .001$, $\eta^2 = .046$; Solomon n.s.								

The results after the evaluation on correlation between the competence concerning the skills, the relevance of them and the valence of carrying out the tasks show considerable longitudinal correlations, in the intervention group and in the control group (see *Table 16*).

Tab. 16: Correlation between students' competence, teachers' opinions of the relevance of the acquired skills and the students' enjoyment of carrying out tasks (valence), cross-sectional and longitudinal

group		**Skills**	t1			t2		
			Compe-tence	Rele-vance	Va-lence	Compe-tence	Rele-vance	Va-lence
JOBS	t1	Compe-tence	1	0.158	.489***	.377**	0.168	.332**
		Relevance	0.158	1	.399***	.269*	.396**	.306**
		Valence	.489***	.399***	1	.369**	0.207	.458***
	t2	Compe-tence	.377**	.269*	.369**	1	.511***	.816***
		Relevance	0.168	.396**	0.207	.511***	1	.573***
		Valence	.332**	.306**	.458***	.816***	.573***	1
NON-JOBS	t1	Compe-tence	1	0.077	.604***	.400**	0.067	.279*
		Relevance	0.077	1	.322*	0.046	.358**	.307*
		Valence	.604***	.322*	1	.274*	.366**	.405**
	t2	Compe-tence	.400**	0.046	.274*	1	.265*	.615***
		Relevance	0.067	.358**	.366**	.265*	1	.432**
		Valence	.279*	.307*	.405**	.615***	.432**	1

5.1.4 Knowledge and interests about the working world and one's own strength

Highly significant and clearly visible differences can be seen amongst the students in their ratings of the working world and of their own strengths and interests. Teachers of the intervention group recognize in their students a marked increase in both main thematic areas of JOBS lessons. Students in the intervention group attest to a highly significant increase of skills in both these areas (see *Figure 19* and *Table 17*).
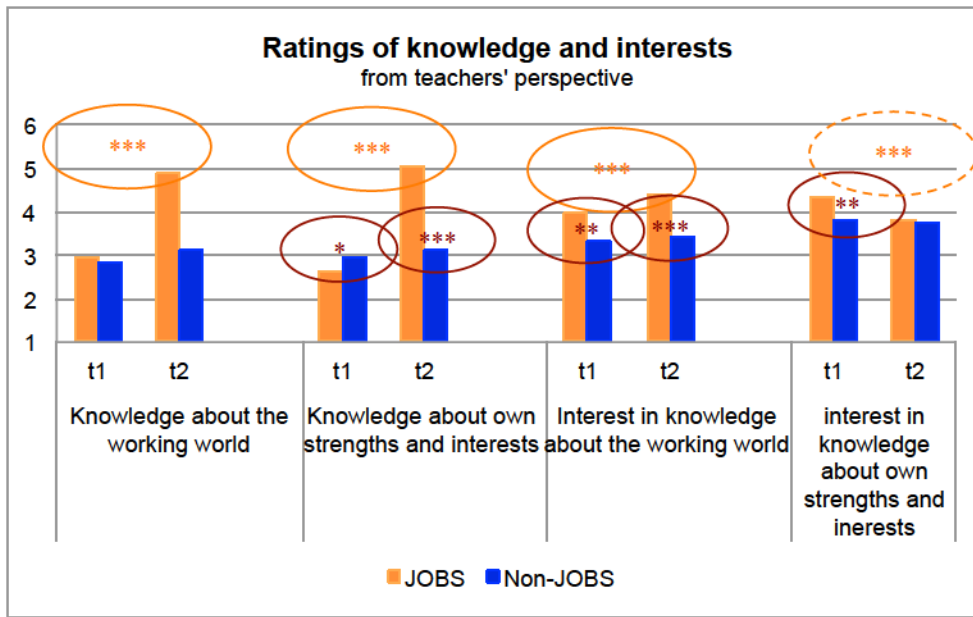
Fig. 19: Teachers' ratings of students' knowledge and interests in the working world and their own strengths and interests, by intervention and control group

In terms of interest in skills pertaining to the working world, JOBS teachers recognize an increase during a school year. In terms of an interest in getting to know more about own strengths and interests, teachers see a significant reduction. That the critical preoccupation with one's self could possibly have led to a saturation point can be deduced from this.

Tab. 17: Students' knowledge and interests from teachers' perspective; means (M) and standard deviation (SD), variance analysis time 1 and time 2 and repeated measurement, by intervention and control group

	t1			t2			t1-t2	
	J M/SD	NJ M/SD	ANOVA	J M/SD	NJ M/SD	ANCOVA	JOBS	NonJOBS
Eval1	2.93/ .96	2.87/ 1.05	n.s.	4.91/ .81	3.12/ 1.30	J > NJ ***	t1 < t2 ***	n.s.
Eval2	2.64/ .88	2.95/ 1.27	J < NJ *	5.07/ .91	3.10/ 1.27	J > NJ ***	t1 < t2 ***	n.s.
Eval3	3.99/ 1.29	3.34/ 1.25	J > NJ **	4.81/ .92	3.44/ 1.18	J > NJ ***	t1 < t2 ***	n.s.
Eval4	4.38/ 1.13	3.81/ 1.24	J > NJ **	3.81/ 1.24	3.78/ 1.36	J > NJ ***	t1 > t2 ***	n.s.

Eval 1 How much knowledge do the students have about the working world? Main effect: $F_{(1, 214)}= 91.55$, $p < .001$, $\eta^2 = .304$; Solomon n.s.

Eval 2 How much knowledge do the students have about their own strengths and interests? $F_{(1, 214)}= 111.63$; $p < .001$, $\eta^2 = .325$; Solomon n.s.

Eval 3 How great is the students' interest to get to know the working world? $F_{(1, 214)}= 43.457$; $p < .001$, $\eta^2 = .172$; Solomon n.s.

Eval 4 How great is the students' interest to get to know their own strengths and interests? $F_{(1, 214)}= 33.901$; $p < .001$, $\eta^2 =.14$; Solomon n.s.

Significant and strong correlations are identified in the intervention group and in the control group especially at the end of the school year (see *Table 18*).

Tab. 18: Correlations between skills about the working world (Eval1), own strengths and interests (Eval2), interest to know more about the working world (Eval 3) and about own strengths and interests Eval 4), teachers' perspective, by intervention and control group

		Eval1_1	Eval2_1	Eval3_1	Eval4_1	Eval1_2	Eval2_2	Eval3_2	Eval4_2
JOBS	Eval1_1	1	.618***	.255*	0.161	.256*	0.1	0.126	0.173
	Eval2_1	.618***	1	.296**	.267*	0.218	-0.003	0.201	0.162
	Eval3_1	.255*	.296**	1	.674***	0.156	0.082	0.172	.238*
	Eval4_1	0.161	.267*	.674***	1	0.144	0.148	0.215	.297*
	Eval1_2	.256*	0.218	0.156	0.144	1	.637***	.600**	.491***
	Eval2_2	0.1	-0.003	0.082	0.148	.637***	1	.638***	.649***
	Eval3_2	0.126	0.201	0.172	0.215	.600***	.638***	1	.729***
	Eval4_2	0.173	0.162	.238*	.297*	.491***	.649***	.729***	1
Non-JOBS	Eval1_1	1	.408**	.307*	0.108	0.222	0.101	0.237	.270*
	Eval2_1	.408**	1	0.135	.321*	0.108	.315*	0.05	0.056
	Eval3_1	.307*	0.135	1	.566**	0.247	0.216	.259*	.351**
	Eval4_1	0.108	.321*	.566***	1	0.184	0.223	0.058	0.172
	Eval1_2	0.222	0.108	0.247	0.184	1	.647***	.587***	.530***
	Eval2_2	0.101	.315*	0.216	0.223	.647***	1	.396**	.405**
	Eval3_2	0.237	0.05	.259*	0.058	.587***	.396**	1	.724***
	Eval4_2	.270*	0.056	.351**	0.172	.530**	.405**	.724**	1

6   Summary of the preliminary results

The summary brings together the results of the part study on the students and the one of the part study on the teachers. After presenting the results on knowledge, gathered by test (6.1), assessed knowledge and its relevance (6.2), followed by results about assessed skills, its relevance and the enjoyment in working on these skills (6.3) and by ratings of knowledge and interests about working world and about one's own strength and interest (6.4), the summary will be completed with conclusions (6.5).

6.1   Knowledge

6.1.1   Results of the knowledge survey for students

The students' knowledge according to the content of the textbook units was enquired by open questions and analyzed by the approach of contents analysis, based on a coding guideline.

The results of the *knowledge evaluation* show that at the end of the school year a statistically high significant difference between JOBS and Non-JOBS students could be identified. In contrast to the Non-JOBS students where no increase in knowledge could be detected, the students of the JOBS intervention group showed a statistically highly significant increase in knowledge.

→ At the end of the school year, a statistically highly significant difference between JOBS and Non-JOBS students is apparent, with an equal starting point at the beginning of the school year. JOBS students therefore acquired more knowledge than Non-JOBS students. This result indicates an effect of the JOBS project towards the desired outcome.

Looking to the *values and their differences* more closely, it becomes apparent that this effect is minimal and the average number of points attained is low (see *Figures 8, 9* and *10*). Students mainly gave very short answers, often only consisting of one word. This was even though the questions were formulated as open questions. These short answers do not score a high point rating. Whether these students lacked the necessary knowledge, or whether this knowledge was internalized at not explicable any more, or whether they simply lacked the skills or the motivation to show and write down their knowledge remains unclear.

→ We assume that the results of the evaluation do not adequately reflect the knowledge of the students. Given that the lessons are connected to discourse and orientated towards more complex learning objectives, merely remembering and listing aspects of knowledge not an appropriate approach needed to record acquired knowledge. The extent to which high-performing and low-performing students differ in the responses they have given will be investigated in the next phase of the research project, if we reach to get the marks of the students.

→ A further distortion of the results about students' knowledge could be due to the insufficient scientific competence of the non-scientific raters who analyzed the answers by the approach of content analysis, based on the collaboratively developed coding guideline on which they were trained during workshops. In addition, the difficulty of the non-scientific raters to go into an objective distance to their students could well have influenced the outcomes of the analysis. Due to a lack of scientific coworkers on the project who were competent to undertake a thorough content analysis, a group of JOBS teachers were selected to carry out the analysis, the scientific researchers' perspective and a necessary distancing from the students as the research subjects could not be guaranteed. This is exemplified in such statements as "We know, how our students think, and they think like that!"

→ The extent to which closed questions could have led to higher scores in knowledge points is unknown. There is an example of one question (K45, see *Table 5*) in which the costs of various products were asked for, where there were no clear differences between the groups as well. Therefore, we cannot assume that a more detailed questioning would not have led to clearer results. As students are required to

give longer answers to open-ended questions in their end-of-year school exams, we assumed that they would be more able to produce longer texts in their answers to the open-ended questions of the survey. It only recently came to our attention that most students demonstrate low achievement in the exam sections where more lengthy text production is required.

A test of the frequency of missing answers at the beginning and at the end of the year shows that JOBS students left less questions unanswered that Non-JOBS students; that this was the case already at the start of the school year, indicates an either stronger or weaker motivation amongst the students to really answer these questions – in other words to pull themselves together and surmount the difficulties of answering these arduous questions.

→ The large number of non-answered questions – even by JOBS students – at the end of the school year indicates that the instrument did not accurately measure the potential of the students.

6.1.2 Knowledge survey for teachers

Even if it is evident that the teachers' subject knowledge has a very important effect on the students' learning, the JOBS content-based subject knowledge of the teachers was not tested to avoid reactance and hurt feelings.

6.2 Ratings of knowledge and its relevance

6.2.1 Students' ratings

On the one hand, self-assessments give less objective results. However, they have a greater potential that can be measured only if transferred into action. As stated above an evaluation of demonstrated knowledge was not possible. As self-assessments and the accompanying reflective competence necessary to carry them out are useful and relevant for the perception of demands and challenges, we see the self-assessment of competencies as a helpful way to investigate potential.

The results of the self-assessments of JOBS-related knowledge (see *Table 5*) show a statistically highly significant increase amongst the group of JOBS students. Likewise, at the end of the school year, the differences are still highly significant at the end of the school year (see *Figure 13* and *Table 7*).

→ After one year of JOBS classes, JOBS students are in command of considerably more extensive abilities in the areas of JOBS-based knowledge. Non-JOBS students didn't increase; the level remains the same.

Examining the assessed *relevance of knowledge* and comparing it between the two groups and in relation to their development no changes can be detected, neither between groups nor between the different times of measurement (see *Figure 13* and *Table 7*).

→ The results of both sample groups (intervention and control group) show that the students of both sample groups judge the knowledge developed on the JOBS program as equally relevant, independent of experience that could be made by participating in the JOBS program or not.

Scrutinizing the *correlations* between the extent of the acquired knowledge and the relevance of it (*Table 8*) a range of stronger and weaker correlations become apparent. This demonstrates that respondents took the questions seriously and answered them thoroughly. The correlations between the extent of knowledge and its relevance is positive (the greater the knowledge rating, the more relevant tis knowledge and vice-versa), particularly when simultaneously surveyed in cross section.

Regarding the knowledge to be acquired during the JOBS course as relevant (relevance time 1) contributes considerably to the learning effect at the end of the school year (knowledge time 2). The more relevant the knowledge to be acquired has been rated at the start of the school year, the greater the increase of knowledge, whereby this effect is also recognizable amongst Non-JOBS students.

→ Rating JOBS based knowledge as relevant strengthens the acquisition of it, visible in the cross sectional and longitudinal results. The perception of relevance of the new JOBS subject contributes to the expected effect (highly significant correlations of medium strength).

6.2.2 Ratings of students' knowledge and their relevance from teachers' perspective

The students' knowledge is rated from the perspective of their teachers. The teachers of both sample groups (JOBS and Non-JOBS) were questioned about their assessment of the JOBS content-based knowledge of their students (see *Table 4*). Thereby they answered this section of the survey from an external perspective, in contrast the students responded from a perspective of self-assessment. The teachers' ratings show the same results. JOBS teachers' view of the knowledge of their students regarding the content worked on in JOBS classes is statistically very significantly higher than Non-JOBS teachers of the control group. The increase is also highly significant in the group of JOBS students (see *Figure 17* and *Table 13*).

→ The teachers' perspectives reflect the considerable increase of knowledge amongst the JOBS students of the intervention group too.

The relevance of the knowledge regarding JOBS contents show no difference between the ratings of the JOBS and Non-JOBS teachers. The teachers of the intervention group and the control group regard this knowledge at the start of the school year as very relevant.

→ The knowledge worked on during JOBS program is rated as very important independent of their role as teacher within the JOBS project. The JOBS project seems to elicit a response of high acceptance in terms of its relevance.

Scrutinizing the correlations positive effects become apparent between the relevance of teachers concerning JOBS-based knowledge and their ratings of the acquired knowledge of the students. Particularly at the beginning of the school year, the relevance of JOBS knowledge (high relevance t1) contributes to the high values in their assessment of students achieved knowledge (r= .60). The remaining correlations are merely weak.

→ The knowledge (to be acquired) about the working world and about perceiving one's own strengths as relevant strengthens from the perspective of teachers the extent of the knowledge gained by students. Teachers who are convinced of the value of this knowledge contribute to the attainment of a higher level of knowledge amongst their students.

As this effect is demonstrated in the intervention and in the control group, the relation to the JOBS lessons to this effect cannot be clearly proven.

6.3 Skills, its relevance and the enjoyment of performing JOBS-based activities

6.3.1 Students' competence, its relevance and the enjoyment of the JOBS based activities

Regarding the skills acquired in the JOBS classes, the JOBS teaching and learning materials (see *Table 5*) contributes to a highly significant *increase of skills* to deal with JOBS-based demands. In other words, this indicates mastery of the required skills. The highly significant difference between the results of the intervention and the control group identified at the end of the school year clearly indicates an acquisition of appropriate competencies amongst students who took part in JOBS classes.

→ JOBS students view themselves as more competent in handling JOBS-related tasks at the end of the school year. They have clearly increased their competencies and learnt a lot during the year.

Regarding the *relevance of these skills* significant effects between the JOBS and Non-JOBS students are apparent at the beginning and at the end of the school year. JOBS students rate the skill of handling specific JOBS-based demands as more important compared to Non-JOBS students (a statistically highly significant difference).

→ JOBS students view JOBS contents as more relevant than do Non-JOBS students. The mere fact that students are part of the JOBS program already appears to have a motivational effect.

Concerning the *enjoyment of carrying out the tasks* in the JOBS classes at the beginning and at the end of the school year JOBS students show statistically very significant higher values compared to the lower ones shown by the Non-JOBS students.

→ Enjoyment of engaging in tasks is more easily recognized when students are carrying out the tasks. Non-JOBS students evidence lower values in this respect and probably find it harder to imagine how these tasks would be in a classroom context, as they have never experienced them.

Verifying the correlations between competence, relevance and valence, strong correlations are evident. The relevance at the beginning of the year exercises positive and strong effects and influences the competencies and the enjoyment of the tasks at the end of the year. However, the extent to which students can differentiate between the assessment perspectives whilst answering the questionnaire is not completely clear.

6.3.2 Students' skills, the relevance of these skills and the enjoyment of engaging in these skills from the teachers' perspective

The students' skills were rated from the perspective of the teachers. Ratings of the relevance of these skills and the students' enjoyment working on the tasks of JOBS program were collected from a subjective point of view of the teachers.

JOBS teachers rated the skills of their students at the end of the school year significantly higher than Non-JOBS teachers rated their Non-JOBS students.

→ JOBS students have clearly attained more skills and differ in this respect from Non-JOBS students from the teachers' perspective.

In terms of the ratings on relevance of these skills there are no significant differences between the groups of teachers.

→ JOBS and Non-JOBS teachers alike share the same opinion towards the relevance of JOBS skills. The teachers of the intervention and the control groups rate these skills as very relevant.

JOBS teachers assess the students' enjoyment of exercising the skills required in the context of the JOBS classes to be significantly higher than Non-JOBS teachers.

→ Experiencing these classes and experiencing this pedagogical setting appears to be meaningful to teachers.

Regarding correlations, in the group of teachers, stronger correlations are identified between simultaneously recorded ratings than in longitudinally recorded ratings. The coefficients are smaller; one should note that in these connections various approaches to each other are put into effect (teachers' opinions and students' ratings).

→ Rating the JOBS-based skills as relevant strengthens the augmentation and contributes to the estimations of enjoyment in engaging these skills.

6.4 Ratings of knowledge and interests about working world and about one's own strength and interest

6.4.1 Students' perspective

JOBS students view their *knowledge about the working world* at the end of the school year as very much higher than at the start of the school year. In their view, they have learned a lot (the increase is statistically highly significant) and in this they differ clearly from the Non-JOBS students (see *Figure 15* and *Table 11*).

In terms of the *knowledge about their own strengths and interests*, respondents show a slight increase. In comparison to the Non-JOBS students, there is however no significant difference (the noticeable difference in *Figure 15* is statistically insignificant, as the standard deviation is high).

→ JOBS students have clearly gained a lot of knowledge about the working world.

→ The ratings of knowledge show a very wide spread. This needs to be investigated to see what factors codetermined this spread.

JOBS students demonstrate a greater interest in *knowledge about the working world* than Non-JOBS students. The (statistically significant) difference is however already present at the start of the school year, after around one month of JOBS lessons, where the interest is magnified and brings with it a larger difference at the end of the year.

→ JOBS students have a great interest in acquiring job-related knowledge. Experiencing the JOBS classes contributes greatly to this process. If their *interest in knowledge about their own strengths and interests* is viewed, the JOBS students show a greater level of interest at the start of the school year (after around one month of JOBS classes) than Non-JOBS students. At the end of the school year however the two groups do not differ in their level of interest.

→ JOBS students are more interested in getting to know their own strengths and interests at the beginning of the school year than at the end. This interest recedes and sinks to the same level as the according level of the Non-JOBS students. Whatever codetermines this occurrence is uncertain.

Verifying the *correlations*, it becomes apparent that the coefficients are higher at the end of the school year than at the beginning. In addition, correlations can be traced that support developments. The extent to which knowledge and interests according to the content areas "working world" and "own strengths and interests" are mutually dependent, or whether interests and knowledge are strengthened by the parallel question cannot be stated for certain.

6.4.2 Teachers' perspectives

JOBS teachers estimate the knowledge of their students at the end of the school year to be very much higher than at the beginning of the school year and higher than the knowledge of Non-JOBS students. This is in terms of knowledge about the working world as well as relating to knowledge about their own strengths and interests (see *Figure 19* and *Table 17*).

→ From the perspective of JOBS teachers, JOBS students learnt a great deal in the main areas of working world and own strengths and interests.

According to the JOBS teachers' ratings, the JOBS students show a greater *interest* in acquiring knowledge and experience related to the working world than Non-JOBS students from the perspective of their Non-JOBS teachers. The abilities increase and cause the discrepancy between the two groups to become greater.

→ JOBS students are very interested in acquiring knowledge and experience relating to the working world.

Scrutinizing the results regarding interest in knowing their own strengths and interests, it becomes apparent that JOBS teachers ascribed significantly higher ratings to JOBS students at the beginning of the school year. They significantly decrease during the year and at the end of the school year were on the level that Non-JOBS teachers ascribed to their Non-JOBS students.

→ Students' interest in getting to know their own strengths and interests recedes during the school year. The extent to which a certain sobering effect of the course occurs cannot be said for certain.

According to correlations, the strongest coefficients are evident at the end of the school year. Knowledge and interest in the working world as well as in one's own strengths are more clearly connected at the end of the school year. However, as this tendency is recognizable in both groups, the extent to which the JOBS program has directly or indirectly influenced this remains unclear.

6.5 Conclusion

Teachers' ratings correspond to the main statements of the students. The JOBS students have learnt a lot in terms of the goals of the JOBS program. This is the case in knowledge as well as in skills. Students show an interest in acquiring this knowledge and skills and enjoy carrying out the activities that arise from the contents of the teaching and learning materials.

Likewise, the Non-JOBS students and Non-JOBS teachers both regard the contents of the JOBS program as relevant. The enjoyment of carrying out the associated activities is greater in the JOBS intervention group that deals directly with the course content than in the Non-JOBS control group.

The JOBS students have learnt a great deal and show great interest in the acquisition of associated knowledge, whereby the interest about the working world is greater than their interest in the acquisition of knowledge of one's own strengths.

Based on statements made by JOBS teachers, teachers who did not participate in the JOBS project (subject teachers) generally experienced a higher level of motivation to participate in lessons amongst JOBS students. In their opinion, the JOBS program has an extensive effect on JOBS students that also carries over to influence learning behavior in other subjects and lessons.

7 References

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8 Figures and Tables

Figures

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