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Work-orientated learning: The use of case studies in business education from a student's perspective

Abstract

In order to integrate practical and work-orientated teaching-learning concepts into commercial vocational education and training courses, the use of simulations is recommended, especially at full-time vocational schools. In Germany, the use of business case studies has also been discussed and recommended for many years. Against this background, it is surprising that there are hardly any empirical findings on the use and impact of these case studies in German commercial schools. This study, therefore, addresses this research gap and focuses on the student perspective in commercial education in the German vocational education and training system.

A total of 305 online-questionnaires from students at different vocational schools in the German states of North Rhine-Westphalia and Lower Saxony, from the commercial-administrative sector, were included in the evaluation. In the questionnaire, the areas of student knowledge in relation to case studies, frequency of use of the case study method, perception of the achievement of the intended didactic goals and the development of student interest in the use of the method, were determined.

The findings show that only about half of the students surveyed at the commercial schools, have had experience with case studies. However, the findings also show that the use of case studies was perceived positively by the students surveyed. The students were particularly positive regarding the promotion of independence to plan their own learning process through the use of case studies. In addition, the data collected could empirically prove that a high situational interest of the students, and the perceived motivation when working with case studies, correlate positively with each other.

***Keywords:** case study, vocational education, Germany, student perspective, didactic goal achievement, interest, practical relevance*

1 Introduction

In Germany, business cases are considered to be a teaching-learning instrument which is particularly suitable for promoting vocational competence and ensuring practice-orientated training, not only in higher education, but also in vocational education and training (VET). Although the usefulness of case studies as a teaching method has been extensively reported in the literature for several decades (see below), the present state of research is insufficient to answer the question of the current relevance of case studies in the teaching practice of vocational schools. In addition, the few research findings in the field of VET are mainly

limited to the perceptions of teachers, and only rarely examine the perspective of students. This study therefore addresses this research gap and focuses on the student perspective in commercial education in the German VET system.

2 Theoretical background

Before presenting the existing research findings below, it is important to define the concept of 'business cases' more precisely, because in many cases there is a misunderstanding in classroom practice between smaller cases (e.g., in the sense of examples) and genuine case studies.

In this study, 'business case studies' refers to a teaching-learning method from management studies. The case study was already developed around 1908 at the Harvard Business School (Herreid 2011, 31) and has also been used in teaching at commercial vocational schools over the last few decades (Pilz 2001; 2013). Business case studies represent decision-making exercises based on complex, realistic situations from professional and working life (Mauffette-Leenders et al. 2005, 9). Therefore, business cases are often described in the literature as being close to professional practice and are thus closely related to work-oriented learning. We understand work-oriented learning here in line with the definition by Schröder and Dehnbostel which is based on former descriptions by the German Federal Institute for Vocational Education and Training, as follows: "In work-oriented learning, there is no direct connection between the place of learning to the place of work. In institutionalised learning places, however, subject content-oriented references to work are included in the curriculum. As special institutions in the education system, training firms, learning offices and production schools are also oriented in a holistic way to work content and environments. In addition, the simulation of work outside of work takes place in reality-oriented models at different locations" (2021, 6).

Business case studies are simulations and belong to the student-active teaching-learning methods, that combine theory and practice by applying already existing knowledge to realistic cases, or by learning various competencies through the case study itself (Huckvale & Van Riper 2019). According to Reetz, case studies are "teaching materials in which real events or events corresponding to reality in social, especially economic, life are processed into a case and which also contain teaching-learning aids for solving the case" (1988, 38). The central didactic reference points in case studies are the handling of complex economic situation and the collective search for problem decisions (Pilz 2001). In concrete terms, a complex economic problem situation is described by the case study authors to the students, often based on a practical example and supplemented by additional information material such as balance sheets, sales figures, strategy papers, etc. of the company in focus. Examples of case studies can be found on the webpage of a European project (<https://e3cases.uni-koeln.de/en/results/case-studies>) including a guideline explaining how to write business cases (<https://e3cases.uni-koeln.de/en/results/manual>). The students then deal with the case in the following phases: 1. confrontation with the case; 2. information about the case material

provided and by independently finding sources of information; 3. exploration: discussion of alternative solutions; 4. resolution: decision-making in groups; 5. disputation: the individual groups defend their decision; 6. collation: comparison of the group solutions with the decision made in reality (Pilz et al. 2013). In terms of self-reliant learning, the teacher here takes a passive role in the teaching process, which is often described in the literature as “facilitator” or “learning consultant” (Pilz & Zenner 2018, 332). These brief descriptions already show that business cases clearly belong to the definition of work-oriented learning. Furthermore, Schröder and Dehnbostel explicitly point out that this form of learning also explicitly addresses "Vocational learning in schools" (2021, 7) with regard to the learning venues in addition to universities.

In the literature, one can find a variety of didactic goals that may be realised through the use of case studies, where in addition to the teaching of self and social competencies through self-reliant learning, the proximity to professional practice and real-life situations is of great value (cf. for example Adler et al. 2004; Dorta-Afonso 2019; He 2015; Marsick 2004; Mauffette-Leenders et al. 2005; Meinhard & Pilz 2016; Pilz 2013; Pilz et al. 2013; Schmidt 2010; Tögel, Faßbender, & Pilz 2021):

- **Practical training:** Through realistic problem situations from everyday work, case studies can help prepare students for action in professional and working life.
- **Motivation:** The realistic design of the case study encourages students to actively engage with the case situation.
- **Knowledge acquisition and application:** Knowledge is acquired through practical situations, and theoretical concepts are applied under the conditions of practice.
- **Communication and conflict skills:** If the case study is solved in the social form of group work, the students' communication skills can also be improved. They also learn how to deal with the opinions and criticism of their classmates and how to resolve any conflicts that arise. During the presentation of the results, the students can practice their presentation and argumentation skills.
- **Independence:** In case studies, students can plan their own learning process and learn to take responsibility for it.
- **Problem-solving and decision-making skills:** The core of the case study consists of a complex, realistic problem situation from professional and working life, on the basis of which the students are to develop, discuss and select alternative solutions:
 - Students learn to recognise and analyse the problems outlined.
 - They independently obtain information or analyse given information that is relevant for decision-making.
 - Based on the information obtained, the students develop different alternative solutions and evaluate them.
 - With the help of the evaluated solution options, the students make a well-founded decision in favour of a solution.
- **Creativity:** Due to the openness of the solution in classic case studies, students can bring different ideas into the solution process. The solution can be presented in

different ways, for example a power point presentation, but also a role play would be conceivable.

- **Interconnected thinking:** The underlying case situation is complex and often cross-curricular, enabling the acquisition of knowledge from different fields. The students learn to recognise factual connections and to think in networked structures.

Against the background of the didactic potentials listed here, it is not surprising that the curricula of the German VET colleges allow the use of business cases and that this use has also been recommended in teacher training for years (Kaiser 1983; Pilz 2001).

3 State of research

One of the best-known studies on the use of teaching-learning methods in vocational education in German-speaking countries, was provided by Pätzold et al. (2003). In the commercial-administrative field, teachers and students were asked about the frequency of use, and the time required, for different teaching-learning instruments. In addition, teachers were asked about the intended didactic goals when using complex teaching-learning methods. Overall, the study was able to determine that frontal teaching and incorporating questioning dominates, and action-orientated teaching-learning is used rather rarely, and with a supplementary function (ibid., 141). Of the students who participated in the study, 17% stated that case studies are used in many lessons, and 23.2% in some lessons. Only 34.4% of the students surveyed expressed having no experience at all with case studies (rest only very limited experience). However, the researchers emphasise that it is unclear whether the respondents really meant case studies or only examples based on small cases (ibid., 158).

According to the teachers, the case study is particularly suitable for applying knowledge and problem-solving skills to real-life situations. The method promotes students' independence, teamwork skills and work motivation. In addition, the use of case studies makes it possible to build up complex expert knowledge (ibid., 160). This last point was also confirmed in a study by Pilz in 2001, which showed that the use of case studies promoted networked thinking among full-time vocational students (Pilz 2001, 197). In addition, teachers praised the possibility of applying knowledge in practical situations (Pätzold et al. 2003, 160). This was also confirmed in a recent survey; according to which, from the point of view of teachers, case studies are better suited than frontal teaching for practicing and applying certain learning contents with a high practical content (Arndt & Pilz 2020, 52).

Studies by Hidi and Renninger have shown that certain learning environments, such as group work and work on the computer, can trigger situational interest. They also found that situational interest has a positive effect on students' cognitive performance. According to this, situational interest focuses attention, enables the integration of information into existing prior knowledge, and increases the overall learning level of students (Hidi & Renninger 2006, 113.).

4 Research questions

The purpose of this survey was to investigate the following research questions by integrating existing research findings and research gaps.

4.1 Experience with case studies

The case study method is based on real situations from working life (Mauffette-Leenders et al. 2005, 9). This practical relevance is intended to help prepare students for action in professional and working life. In this respect, we understand work-related learning as a form that is oriented as closely as possible to the business processes of reality in commercial professions and includes the elements of planning, implementing and controlling (Pilz & Fürstenau 2019). Especially for students in full-time vocational education, who do not go through major practical training phases, the case study can be a particularly important method in the classroom.

Q 1: Do students in part-time education have more experience with the teaching-learning method case study than students in full-time education?

In Germany, educational policy is the responsibility of the individual states. Thus, different curricula exist for the educational programmes (except for vocational school within the dual education apprenticeship system) in the states studied.

An exemplary comparison of the curricula for the occupation-related learning area in the vocational school for business and administration from Lower Saxony and from North Rhine-Westphalia (NRW) has shown that in both guidelines, an action orientation of teaching is recommended (Lower Saxony Ministry of Education 2010, 1; Ministry for School and Further Education of the State of North Rhine-Westphalia 2015, 17). In both curricula, however, no examples of action-orientated teaching-learning methods are given. In comparison, the curriculum of NRW illustrates the concept of action orientation in more detail, by suggesting the use of a model company, and the use of learning situations that depict work and business processes of the department (Ministry of School and Further Education of the State of North Rhine-Westphalia 2015). In the elaboration of the federal state of Lower Saxony, the concept is not presented in much detail.

Q 2: Are there quantitative differences in student experience of dealing with the case studies teaching-learning method in vocational school or in the other educational courses between students from NRW or Lower Saxony?

4.2 Frequency of use

The use of action-orientated teaching methods is often neglected in practice. Frontal teaching plays the dominant role in the instructional design of business lessons at vocational schools, regardless of the underlying learning content (Guo & Pilz 2020; Pilz & Gronowski 2020).

In this respect, it is necessary to investigate how the frequency of use of case studies at vocational schools is perceived from the students' perspective.

Q 3: How frequently is the case study teaching-learning method currently used in business classes from the students' perspective?

4.3 Goal Attainment

The question of which goals the use of case studies is suitable for, is only answered from the teacher's perspective in studies conducted in Germany to date. According to the study by Pätzold et al., the development of contextual knowledge and the promotion of problem-solving skills are a primary goal of this teaching-learning method. Furthermore, the teachers are of the opinion that the use of case studies can strengthen the independence, teamwork and work motivation of students. In addition, teachers praise the possibility of applying knowledge to practical situations (Pätzold et al. 2003, 160). This has also been confirmed in a recent survey; according to which, from the point of view of the teachers, case studies are better suited than frontal teaching for practicing and applying certain learning content (Arndt & Pilz 2020, 52). According to the study by Pätzold et al. (2003, 160), teachers feel that the case study method is not suitable for coping with the wealth of material in the curriculum and for adapting the learning process to individual students.

While previous research has primarily examined the achievement of objectives from the perspective of teachers, this survey will examine students' perceptions of didactic objectives. The following research question will be answered:

Q 4: From the students' point of view, to what extent are several didactic goals achieved?

4.4 Interest

First, the relationship between case study use and situational interest will be analysed with the help of the data collected. To this end, the following research question will be answered:

Q 5: To what extent are case study use, and students' situational interest, connected to each other?

Developing the student's interest is of particular importance, because interest, as a component of intrinsic motivation, influences the students' ways of working (Deci & Ryan 1987, 28). This means that the level of interest determines how students deal with the object of interest. Referring to a compilation of different study results by Hidi and Renninger (2006, 111), interest has an influence on students' attention, goals, and learning levels. This can have a positive effect on the intrinsic motivation of learners (Ferdinand 2014, 41). This relationship is examined in more detail by analysing the correlation between high situational interest of students, and perceived motivation when working with case studies.

The first phase of the interest model according to Hidi and Renninger, the "situational interest," (2006, 121) can be triggered by didactic measures in the classroom. In order to

investigate the influence of case study design criteria on students' situational interest, this study will examine the following research question in more detail:

Q 6: To what extent do other design criteria correlate positively with situational interest?

5 Method, sampling and data analysis

5.1 Questionnaire development

To answer the research questions, a standardised online questionnaire was developed using the LimeSurvey tool. The questionnaire comprised a total of 27 items, so that the processing time is about 20 minutes.

The items of the questionnaire were divided into three sub-areas: Personal questions, experience with case studies, and interest in case studies. The first part asks for socio-demographic data such as gender, state, and educational programme attended. The second part of the questionnaire measures students' experiences with the case study teaching-learning method. This part examines how often the case study is used in the classroom and how the students perceive the achievement of the intended didactic goals. This part of the questionnaire is based on the survey of Pätzold et al. (2003). In the last part, the effect of case studies on students' situational interest is empirically surveyed. To survey task-related situational interest, items were used to measure both method interest and the subjective significance of the case study topic for the students' present and future. Ferdinand's (2014) meaningfulness experience scale, and Tauer and Harackiewicz's (1999) task enjoyment scale, were used to construct this subdomain. In addition, three self-designed items were added to capture student attitudes towards selected design criteria of case studies. These items measure the processing time of case studies, the effect of the group work phase and the amount of enclosed materials, on students.

The items measuring the achievement of didactic goals and the effect on situational interest, are answered with a four-point Likert-type response scale from "always agree" to "disagree," there is also the option of selecting "no answer" if the students surveyed are unable to assess the item, following Pätzold et al. (2003).

Prior to use, the questionnaire used was checked in a pre-test and by an expert, for comprehensibility and processing time, and further developed.

A large sample size was expected from the online questionnaire, as the target group has a particularly high online affinity, and the survey method allows geographically dispersed students to be interviewed (Lefever et al. 2007, 574). Due to the pandemic situation prevailing at the time of data collection, this research design was also highly suitable (Barchard & Williams 2008, 1125). The survey was conducted anonymously so that the students, in their role as evaluators of the case study method, had no inhibitions about giving their honest opinions.

5.2 Sample

The survey was conducted with students in various educational programmes of vocational schools in NRW and Lower Saxony. For this purpose, 20 principals of vocational schools in NRW and 28 principals in Lower Saxony were personally asked by letter to agree to the planned data collection; 381 questionnaires were processed by the surveyed students from vocational schools in NRW and Lower Saxony.

This corresponds to a response rate of 45.8%. Due to the anonymous nature of the survey, it was not possible to check whether all schools that gave their consent also participated, and how many of the students surveyed belonged to which school.

5.3 Data analysis

A total of 76 questionnaires were excluded from the data evaluation. Of these, 74 students had not answered the item about the existence of experience regarding the use of case studies. In the item the definition of case studies was built in, which is central for the further completion of the questionnaire. Due to the limited methodological knowledge of students, this definition cannot be dispensed with. For future uses of the questionnaire, a shortening of the definition or its integration into the instructions of the questionnaire, can be considered.

Descriptive statistical tools were used to illustrate the data collected. To analyse the relationships between individual variables, scales were formed and examined for significant correlations. The correlation coefficients, and the associated significance values, were calculated using the statistical programme JASP 0.14.1.0.

6 Results

6.1 Knowledge

Of the total 305 students surveyed, 151 students (49.51%) reported no knowledge of the use of case studies. In the study by Pätzold et al. (2003, 158) only 34.4% of the students surveyed indicated no experience with case studies. This difference is large at first glance, but must be put into perspective, as Pätzold et al. stated, that the definition used was not unique and also included less complex case method.

Research Question Q 1:

First, we determined the absolute and relative frequencies of how many students in part-time education courses reported experience with the use of case studies. Among the education programmes studied, part-time education programmes included the vocational school part of dual apprenticeship programmes. Overall, 55.76% of students in part-time education programmes indicated experience with case studies. Full-time education programmes include preparatory training or entry-level vocational school, vocational high school, and vocational college (for German vocational school types, cf. Fürstenau et al. 2014; Hippach-Schneider &

Huismann 2016). In comparison, 37.50% of students in full-time school-based educational programmes reported case study experience.

Research question Q2:

A comparison of the two federal states, revealed that 51.81% of the participating students in NRW reported experience with the use of case studies, while in Lower Saxony the figure was 48.21%. Accordingly, at first glance, no remarkable differences can be identified; however, when looking at vocational school students separately from the other educational programmes, it was found that 53.38% of vocational school students who were part of the apprenticeship programme in NRW and 56.07% in Lower Saxony indicated experience with case studies. This similarity was to be expected, since in both NRW and Lower Saxony, vocational school curricula for the apprenticeship programme is based on the Kultusminister Konferenz (KMK, The Standing Conference of the Ministers of Education and Cultural Affairs of the Länder in the Federal Republic of Germany) nationwide framework curricula (Pilz & Fürstenau 2019).

In the other full-time vocational courses, 48.33% of students in NRW reported experience with case studies. In Lower Saxony, this value is significantly lower at 36.96%. This result could be expected based on the exemplary analysis of the different curricula of the full-time vocational school type called “Berufsfachschule” (Vocational school at upper secondary level offering a wide range of branches and courses of varying duration, KMK) in both states.

6.2 Frequency of use

Research Question Q3:

The collected student responses about the frequency of use of case studies in business classes are shown in Figure 1.

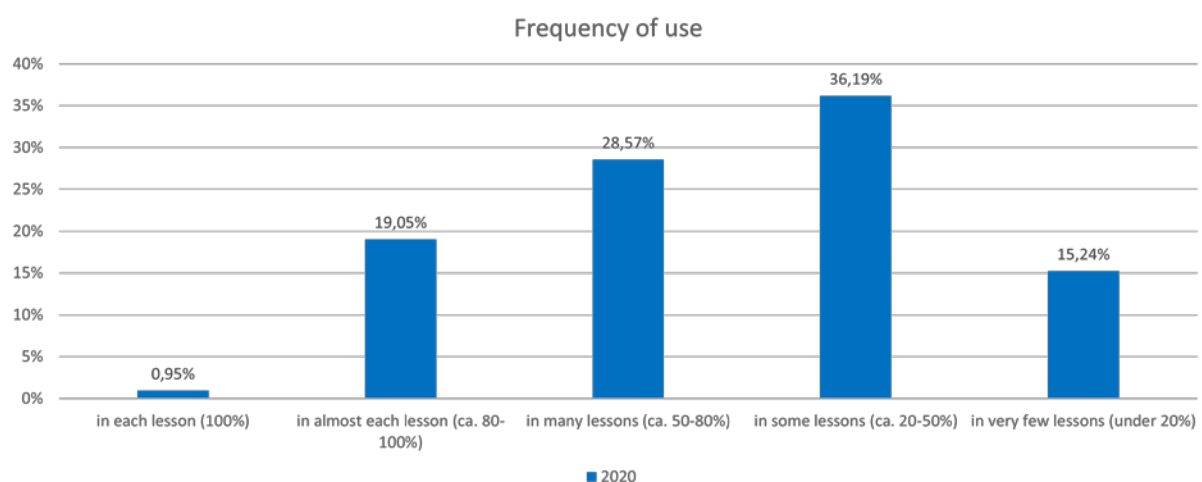


Figure 1: Frequency of use of case studies in business education

The data series is right skewed. This means that characteristic values with low or medium frequencies of use are relatively frequent. Most respondents selected that case studies are used only in some lessons of business and administration teaching. Since the case study teaching-learning method requires an intensive preparation on the part of the teachers, the result is nevertheless to be regarded as positive, since use in some lessons is thus high at approximately 20-50%. Due to the significant scattering of the data, an exact answer to the research question F 2.1 is not possible.

6.3 Achievement of the intended goals

Research Question Q 4:

The items collected were assigned to the four sub-competencies of action competence: professional, social, personal and methodological competence. The items of each sub-competency were aggregated in order to compare student perceptions of achievement of the different sub-competencies.

6.3.1 Professional competence

The items on conceptual knowledge acquisition and knowledge application were aggregated to form a Likert scale for assessing subject matter competence. When aggregating the two items, a medium agreement of the students on the achievement of the didactic goals related to subject competence can be observed ($M=2.89$; $SD=0.55$). Comparing the individual items, it can be seen that agreement tends to be higher for the item on knowledge application ($M=3.06$; $SD=0.69$) than for the item on the development of conceptual knowledge ($M=2.73$; $SD=0.68$). The student perception that case studies are better suited for learning how to apply knowledge than for elaborating conceptual knowledge, confirms the results of the teacher survey by Arndt and Pilz (2020). According to this, teachers see case studies as having an advantage over traditional lessons in terms of both knowledge acquisition and knowledge application, with knowledge application also tending to be rated higher by teachers than knowledge acquisition (ibid., 52)

6.3.2 Social competence

The items on communication and conflict skills were aggregated to measure student perceptions of the achievement of didactic goals related to social competence.

When the two individual items were aggregated, the lowest level of agreement was measured, compared to the other sub-competencies ($M=2.79$; $SD=0.67$). The values reflect lower agreement of goal achievement in the area of social skills. Comparing the two items reveals stronger agreement in improving communication skills ($M=2.93$; $SD=0.75$), compared to conflict skills ($M=2.65$; $SD=0.82$), in the use of case studies.

6.3.3 *Self-competence*

The achievement of the didactic goals for self-competence, was measured differently to the other sub-competencies with only one item, which also explains the higher standard deviation, since the collected data were not averaged individually for each participant.

The item on the improvement of independence reflects the highest mean value, in comparison to the other items of this question matrix. Thus, from the students' point of view, the didactic goal of promoting independence is best achieved through the use of case studies (M=3.07; SD=0.80). This could be an indication that students appreciate the freedom granted when working on case studies. According to this, students would learn to take responsibility for their own learning process and to plan it independently (Pilz & Zenner 2018).

6.3.4 *Methodological competencies*

The items for measuring the didactic goals of improving problem-solving ability, promoting creativity and networked thinking, were assigned to methodological competence.

In the aggregation, a medium level of agreement of the students to the achievement of the didactic goals in the area of methodological competence can be determined (M=2.91; SD=0.58). When comparing the individual items, it is noticeable that the promotion of networked thinking (M=3.00; SD=0.78) and the improvement of problem-solving ability (M=2.95; SD=0.74), are rated higher than the promotion of creativity (M=2.79; SD=0.80).

The students' clear agreement with the item "improvement of problem-solving ability," confirms the results of the teacher surveys by Pätzold et al. (2003, 160) and Arndt and Pilz (2020, 51). This result was to be expected, since case studies, by definition, describe problematic situations for which students search for, discuss, and select possible solutions in group or individual work (Herreid 2011, 31).

The students' perception that the case study teaching-learning method is suitable for improving networked thinking ability, confirms the results of an experimental study by Pilz (2001). In this study, there was found to be a positive correlation between the processing of case studies and networked thinking ability (Pilz 2001, 197).

6.3.5 *Other didactic goals*

The two items on the suitability of case studies for student motivation and practical school-based training, were evaluated separately.

The item on the suitability of case studies for student motivation was rated lowest by the students (M=2.55; SD=0.90). The mean value is close to the middle of the scale used, according to which the participating students neither agree nor disagree with the statement "Case studies are particularly well suited to motivate." The comparatively high standard deviation also reflects less agreement about this statement than about the other items surveyed. It is also noticeable that the answer option "does not apply" was selected

significantly more frequently for this item than for the other items. Nearly 18% of the students surveyed do not find that case studies motivate them. The item on the perception of the case study method as a chance to get a practically orientated vocational school education, was rated higher by the students ($M=2.80$; $SD=0.89$). However, the standard deviation for this item is also comparatively high, indicating that there is also a greater difference of opinion among the respondents for this item.

When evaluating the individual didactic objectives, it is noticeable that all objectives received more positive evaluations ("always applies" or "often applies") than negative evaluations ("rarely applies" or "does not apply"). This result suggests that the majority of the students find the case study suitable for realising the associated didactic objectives.

6.4 Situational Interest

Research question Q 5:

The items surveying the present and future importance of the topics covered in case studies, were combined in the indicator ‘subjective importance’.

When the two items were aggregated, no significant agreement value was recorded ($M=2.55$; $SD=0.68$). Examination of the individual items also reveals no major differences in the ratings of present ($M=2.52$; $SD=0.88$) and future ($M=2.59$; $SD=0.87$) importance of the topics covered. The result is surprising in that, according to the definition of the case study teaching-learning method, students should develop solutions to problems based on actual, practical, and problematic cases (Pilz & Zenner 2018, 326). This should create a connection to current or later professional situations in order to enable the transfer of what has been learned (Kopf et al. 2010, 4).

To measure the indicator “method interest,” several items were aggregated (cf. Figure 2).

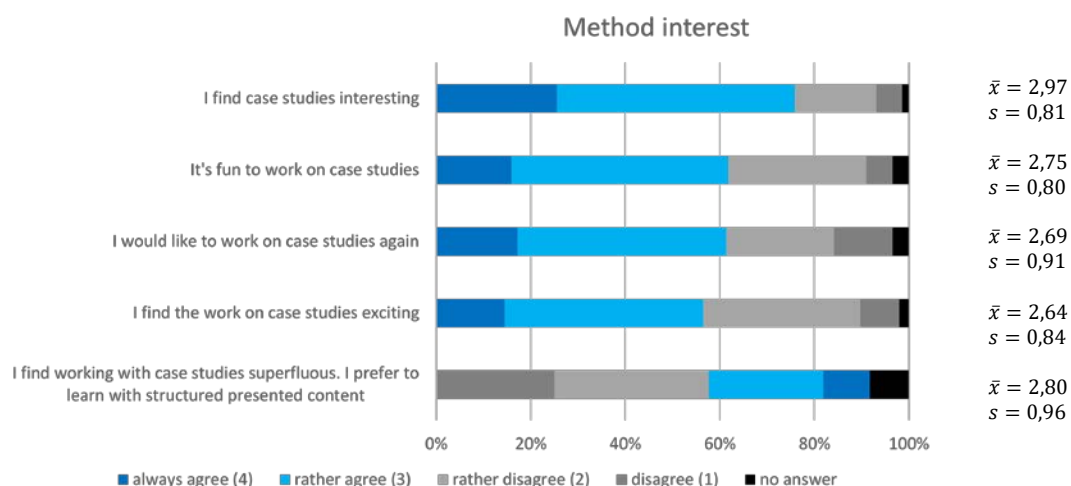


Figure 2: Results collected on method interest

The scale measures task interest and was reformulated for this questionnaire to measure interest in the case study teaching-learning method in general. In addition, the last item was formulated independently, to investigate whether working with case studies is useful from the students' point of view, or whether traditional teaching-learning methods should be used. When the five items on method interest were aggregated, a medium level of agreement was obtained ($M=2.77$; $SD=0.71$). This is an indication that the use of the case study teaching-learning method arouses situational interest among the students surveyed. This indication is reinforced by the high mean value of 2.97 for the item "I find case studies interesting."

The correlation analysis performed was able to show that the two variables "subjective meaningfulness" and "method interest" correlate significantly, with medium effect-size ($r=.523$; $p<.001$). The two variables thus represent a common construct. This construct is referred to as "case study situational interest" in this study.

To test the research questions, the construct "case study-related situational interest" was examined for significant correlations with the item on motivation. The calculation of the correlation was able to empirically demonstrate a significant mean correlation between the construct "case study-related situational interest" and students' perceived motivation ($r=.537$; $p<.001$). This shows how closely case study situational interest and motivation are linked, and that agreement regarding the situational interest items lead to agreement of the motivation variable and vice versa. This correlation does not necessarily indicate a causal relationship, as no statement can be made about which variable is cause and which is effect. Nevertheless, there is a medium-sized positive correlation of the two variables, which means that the research question that was postulated can be confirmed.

Research question Q 6:

To answer the final research question, student perceptions of selected design criteria of case studies were measured first. When looking at the individual items, the statement "I liked working in groups" stands out, as a high arithmetic mean of 2.95 could be determined here. This is an indication that teachers should combine the case study processing with group work phases, because the students appreciate the joint processing. The other two items on processing time and number of materials have means close to the midpoint of the scale used. That is, the statements "There are too many materials/texts in the case studies" and "It takes too long to process case studies" have neither clear agreement nor disagreement.

A correlation analysis was used to determine which design criteria are related to the situational interest of participating students. For this purpose, the individual design criteria were examined for significant correlations with the construct of case study-related situational interest. On the level of the individual selected design criteria, the expected correlations could be confirmed for the criterion of "processing time" ($r=.432$; $p<.001$) and the number of materials and texts ($r=.254$; $p<.05$). "Working in groups" and "case study situational interest," do not correlate significantly. However, the significant positive correlations between the design criteria "processing time" and "number of materials and texts" and the construct of

“case study-related situational interest” can be understood as an indication of a positive correlation between a positive evaluation of the design criterion and a higher case study-related situational interest.

A specific statement about the relationship between design criteria and case study situational interest, cannot be made at this point, because a later analysis indicates a low reliability of the scale. Thus, to answer the research question more precisely, further investigations with other design criteria would be an interesting continuation of this study.

7 Discussion

The data obtained show, that students who have experience in learning with case studies, generally assess them positively. In particular, the learning of self-competence and specialist knowledge are positively emphasised, and the arousal of interest is also clear. Surprising is the finding that the students only recognise the future significance of case studies to a limited extent. Thus, the practical relevance of case studies in the context of work-orientated learning, as postulated above, was not explicitly mentioned by the students. However, it should be borne in mind that students in full-time vocational school courses in particular, generally do not yet have any work experience, and that it may therefore not yet be possible to make a realistic assessment of the practical relevance. Other European studies also show that full-time commercial students in particular, rate the practical relevance of teaching-learning instruments related to workplace situations very positively (Edeling & Pilz 2016).

However, our findings highlight another feature: only about half of the students surveyed are familiar with case studies, and of these, a number have only been able to gain experience very sporadically. In addition, there is the finding that case studies were more likely to be encountered by students in part-time classes rather than in full-time vocational school classes. Consequently, case studies are more likely to be used with apprenticeship-students who are already familiar with professional practice, rather than with students for whom case studies might particularly enhance work-related learning through their practical relevance.

In our opinion, these unexpected findings require a deeper interpretation as well as some recommendations. To this end, the analysis should be conducted by means of the dimensions central to school-based implementation research: a) curricular framework, b) necessary resources, and c) the role of teachers and students as actors.

a) Curricular framework

Curricular specifications represent a central condition for the use of case studies, although various studies document the difference between the written curriculum and the enacted curriculum (Chen et al. 2021; Pilz et al. 2014; Zenner et al. 2017). The curricula in the school-based part of the dual apprenticeship system, which are largely standardised in Germany, are also particularly close to work-orientated learning in the commercial occupations, due to their orientation to real business processes. In this context, the structuring

not via subjects but via so-called “learning fields,” that map an entire business process from practice, is particularly favourable for the use of case studies (Pilz & Fürstenau 2019).

In the training courses of full-time vocational schools, the curricula are regulated differently at the level of the federal states. As already indicated above, the curricula in the federal state of NRW are somewhat more practice-orientated in contrast to Lower Saxony, which is due in particular to the learning field structure also introduced there. Despite these partial differences, the use of case studies is possible in both federal states with regard to the curricular specifications. This possibility is also underlined by the fact that case studies, in contrast to other complex teaching-learning instruments facing work-related situations, such as learning offices, only take up a few school hours and can therefore be integrated relatively easily into curricular and didactic planning.

b) Required resources

If the curricular requirements specifically allow for the use of case studies, the relatively weak dissemination of case studies measured in our study could be due to the lack of resources. The resource of teaching time has already been excluded as a limitation, consequently the focus is on the necessity for rooms and media. Again, in contrast to, for example, business games or training firms, the case study is a teaching-learning instrument with low demand. The students of a class can usually do the group work in the classroom. The cases themselves, as well as the presentation of the case study solution results, are presented via the media that are also common in traditional teaching, such as handouts, data projectors, and so forth.

A possible limitation of the use of case studies, is the lack of case studies designed for the commercial sector. While there is a wide range of case studies in the University sector (cf. e.g. Harvard Business Case Center or The Case Center), such offers are not available to the same extent in the vocational school context, apart from a few exceptions (cf. e.g. Pilz 2003). The conception of didactically demanding case studies by the teachers themselves, however, requires not only the corresponding know-how, but also a large amount of work, and thus time. The findings presented above also show the importance, from the students’ point of view, of high-quality, modelled case studies. However, it can be assumed that individual teachers, and even entire teaching staffs, shy away from this investment of working time. Consequently, greater development work, for example, by scientific institutions, author collectives of textbook publishers, or also the teacher training institutions, is recommended here.

c) The role of teachers and students as actors

The special role of teachers has already been briefly discussed above, in the context of the enacted curriculum. If a somewhat deeper analysis is carried out here, it can be assumed that teachers use case studies when they are already familiar with this teaching-learning method and are convinced of its learning effectiveness. However, the study by Arndt and Pilz (2020) has determined, for German vocational school education, that a significant number of teachers are not sufficiently informed about this teaching approach. Consequently, in the

future it will be necessary to provide comprehensive information about case studies in university teacher training, as well as in the subsequent teacher traineeship, to enable future teachers to use them in commercial teaching. To this end, we have, for example, actively involved students of business education in the didactic design of case studies within the framework of research-based learning (Tögel et al. 2021).

Ultimately, the focus should be on the learning of individual students. Our data suggest that some of the students themselves are not convinced of the use of case studies or even reject them. Although our findings also show that a small number of students, for example, do indicate experience with case studies and emphasise the teaching of competencies such as specialised knowledge through case studies, for many other students the lack of familiarity with case studies and the associated learning processes, can be cited. On the one hand, this is because case studies are also only available to a limited extent for the general and pre-vocational education school sector, at least in the German case (Pilz 2013). This situation consequently makes it difficult for students to become successively acquainted with this teaching-learning instrument and can lead to excessive demands in dealing with complex problems, especially for students with learning difficulties. On the other hand, the experience of the students so far, could indicate a lack of quality in the case studies used. Should this be the case, then the development and provision of didactically high-quality case studies, as well as appropriate training of the teaching staff, should be advocated.

Finally, a fact concerning both teachers and students must be pointed out. Not only in the German context, but also internationally, there are findings documenting the adherence to traditional teaching models, in the sense of teacher centred learning, in commercial training (Guo & Pilz 2020; Pilz & Gronowski 2020). One reason for this, which, among others, is regularly seen, is the fact that examinations are less designed to deal with practical problems and are more orientated toward subject-specific content and structures. Consequently, both teachers and students act rationally when they prefer a traditional lesson design with a strong focus on subject knowledge, in order to comply as well as possible with the "hidden curriculum" of the exams. Although a number of reforms in German commercial training in the past, have contributed to a stronger practical orientation of the examinations, there is also still a lot of room for innovation here, in order to secure work-orientated learning via the examination requirements.

8 Outlook

This study is subject to some limitations. Due to the retrospective investigation of student perceptions, the validity of the conducted measurement is negatively influenced by forgetting and error inference (Blome & Augustin 2015). This is exemplified by the Cronbach Alpha values for method competence, method interest, and design criteria, which were determined via the statistical evaluation programme JASP. For the variable methodological competence, an approximately "good" Cronbach's alpha of 0.616 could be calculated. According to this, the internal consistency of the items used to operationalise the latent variable

“methodological competence,” is not yet optimal. If the questionnaire is used again, the operationalisation of methodological competence should be revised, for example, by adding another item to measure the transfer ability of the students. A good Cronbach Alpha value of 0.880 could be determined for the variable “method interest.” Using the statistics programme JASP, it was also possible to determine that the Cronbach's alpha would increase to 0.905 if the self-constructed item "I find working with case studies superfluous. I prefer to learn with structured presented content" was omitted. This could be an indication that this item was understood differently by the different students surveyed (Leiner 2006, 2). If the questionnaire is used again, deletion of this item should be considered.

For the construct “design criteria” a Cronbach's alpha of 0.176 could be calculated. This value shows that the characteristic “design criteria” could not be measured stably with the selected items. This can be explained by the fact that the three selected criteria could not achieve sufficient content representation. For this reason, no statement could be made about the relationship between design criteria and case study-related situational interest when presenting the results.

In addition to these adaptations of the test items, a modified test design with an experimental, comparative survey would also be an interesting extension of the study. Here, one class experiences a teaching-learning process with the use of case studies, and a control group without the use of case studies.

Despite these limitations, the findings indicate that only a little over half of the students surveyed were aware of the use of case studies, but the students with experience of case studies perceived them very positively. This result should encourage teachers in the business-administrative field at vocational schools, to use action-orientated teaching-learning methods such as case studies in order to further increase work-orientated learning.

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