Teaching Outsourcing Ecosystems: A Reverse Case Study Approach

Niklas-Kim Laerum*[0009−0005−3279−3505] and Markus Nüttgens

Hamburg Research Center for Information Systems (HARCIS),University of Hamburg, Hamburg, Germany
niklaskim.laerum@uni-hamburg.de, markus.nuettgens@uni-hamburg.de
* Corresponding author

Abstract. The proposed teaching method is based on an adapted reverse case study concept combined with additional teaching methods. The didactic concept includes both a teacher-centered and a student-centered approach. The students' task is to develop a (reverse) case study based on DIN SPEC 1041 in small groups of up to five students, which supplements and expands the basic framework of the specification in an application-oriented manner. Therefore, the groups must select a suitable use case either by researching the literature or by contacting a company directly. The didactic approach has already been tested twice in a master's course at the University of Hamburg. During the implementation of this didactic approach, it became apparent that it is important for lecturers to find a balance between providing support and allowing students to work independently. According to the students, this teaching method enabled a more profound engagement with the topic than is typically possible in traditional lecture-based settings. Even though students perceive the workload to be increased, they see the benefit of investing the additional work.

Keywords: Information systems · Academic teaching · Outsourcing ecosystems · Reverse case study.

1 Introduction

Sourcing ecosystems refers to a dynamic network of internal and external partners that are jointly geared towards procuring resources, services, technologies, or expertise. Outsourcing, understood as the sourcing of tasks/processes, is a challenging aspect of sourcing ecosystems [31]. Therefore, academic teaching of outsourcing ecosystems leads to the following three research questions (RQ):

- RQ1: Which specifications exist in the context of outsourcing ecosystems?
- RQ2: Which didactic approaches are used in academic teaching, and what are their (dis)advantages?
- RQ3: To what extent does the methodological concept of the reverse case study represent an alternative?

There are numerous specifications of organizations for standardization that provide guidance for managing outsourcing projects [10–13, 21]. One advantage of a specification lies in its function as a normative reference (common ontology), which enables a systematic and structured approach for the organizations involved. In this paper, we use DIN SPEC 1041 as an example, as it is based on a well-structured procedural model coordinated and elaborated by scientific researchers in collaboration with domain experts. This specification served as a starting point for the development of the ISO 37500:2014 standard (in particular Chapter 4).

The aim of the teaching approach presented in this article is to introduce a method that enables students to learn about outsourcing ecosystems practically. This involves moving away from the traditional teaching approach of a lecture with frontal teaching and a subsequent written exam. The teaching approach also follows the motto "digital first" and is therefore 100% digital. In addition, students learn how to present their findings in the form of video presentations. Being able to present yourself digitally can be an important skill in today's globalized teams and digital world. It is important not only to prepare students for professional life in terms of subject knowledge but also to teach them skills that are needed in the job market [9]. The approach presented in this paper focuses on cognitive skills for solving problems and conducting research, as well as presenting solutions. In addition, social skills such as collaborative work and communication are also to be taught. Another aspect is training the ability to organize work independently to meet a specific deadline. In addition, students should learn to document their work in a clear and precise manner.

The article is structured as follows. Section 2 focuses on the specifications in the context of outsourcing ecosystems and the didactic approaches used in higher education. Section 3 shows the methodology used to develop the didactic concept. This is followed in Section 4 by the implementation of the didactic concept, followed by the evaluation in Section 5. Section 6 discusses the results, provides a summary and outlook.

2 Literature Review

The specifications found in the context of outsourcing ecosystems are listed first. This is followed by a presentation of the didactic approaches in higher education, with a brief explanation of the individual methods. Finally, a short list of the advantages and disadvantages of the individual teaching methods is provided.

2.1 Specifications in the Context of Outsourcing Ecosystems

To tackle RQ1, the specifications mentioned in Section 1 are explained briefly, and their focus is outlined.

The DIN SPEC 1041-2010-05 specification [10] from 2010 serves as a practical guide for companies to implement outsourcing projects in a structured and efficient manner. Therefore, the specification describes an outsourcing phase model

that is divided into four phases: (1) Process Analysis and Redesign, (2) Design of the Organization and Outsourcing Relationships, (3) Service Provider Selection, and (4) Service Migration and Regular Operation. The specification is written primarily from the perspective of the outsourcing provider. By taking an abstract view of outsourcing objects, no distinction is made between the outsourcing of information technologies and the outsourcing of business processes. As a result, the procedure described should be generally applicable. It is particularly important that the procedure model described should not be understood as strictly sequential. The order may change, or phases may also be processed concurrently.

Another specification is DIN SPEC 91289:2013-05 [11] from 2013. This specification provides guidelines for the structured implementation of benchmarking in outsourcing projects that deal with the outsourcing of technology-oriented and knowledge-intensive services. Like DIN SPEC 1041, this specification was coordinated and elaborated by scientists in collaboration with domain experts. It is primarily focused on small and medium-sized enterprises (SMEs) to support them as outsourcing providers in carrying out benchmarking for the selection of suitable outsourcing services and service providers for their outsourcing projects according to a standard procedure. This specification is more specialized than DIN SPEC 1041.

DIN SPEC 66286:2014-07 [12] from 2014 is a further specialization for outsourcing projects. This specification provides guidelines for implementing outsourcing projects with cloud service providers. The aim is to support SMEs in the management of cloud computing solutions by providing a standard procedure for cloud sourcing projects in the cloud.

ISO 37500:2014 [21] from 2014 is a guideline that covers the entire outsourcing lifecycle and provides definitions of terms, concepts, and processes that are considered good practices. Unlike the other specifications above, this specification describes the key phases, processes, and organizational framework conditions of outsourcing, regardless of company size or industry affiliation. This guide is intended to help companies establish a good outsourcing corporate structure that offers advantages to both the customer and the provider. It promotes the development of flexible outsourcing agreements that can be adapted to changing business requirements and provides guidance on managing risks that may arise in the context of outsourcing processes. Additionally, it places particular emphasis on establishing cooperative relationships in which both parties benefit from each other.

DIN SPEC 33451:2015 [13], published in 2015, lists standards that are suitable for creating service catalogs in outsourcing projects. The service catalog describes which services a service provider offers and which services a service recipient can use. A service catalog is an important tool for creating transparency regarding service provision within an organization or organizational unit. This transparency is the foundation for making decisions about outsourcing strategies in an organization. In addition, the specification is suitable for specifying the performance relationships between organizational units within an organization. The specification is independent of the size and industry of the companies

involved and is suitable for the performance specification of core and support processes.

2.2 Didactic Approaches in Academic Teaching

There are numerous teaching methods and learning strategies in literature. Therefore, a complete list of all didactic approaches would go beyond the scope of this paper, as some approaches represent a combination of several approaches. Therefore, a representative overview of didactic approaches used in higher education is presented here to answer RQ2. Each approach is briefly explained, and at least one example of its use in higher education is given. When it comes to different teaching methods and learning methods, a distinction can be made between teacher-centered and student-centered approaches [40]. In the teacher-centered approach, students are passive and reactive in class. This means they are not given sufficient opportunity to develop their critical thinking and problem-solving skills. In the student-centered approach, on the other hand, students are encouraged to develop their reflective and critical thinking skills as well as their sense of responsibility. The teaching methods identified are described as follows:

Lecture-based Learning (LBL): This is the traditional teaching method in higher education, in which the lecturer presents knowledge in a structured manner and the students act as passive listeners. In their article, Burkill et al. [7] demonstrated that lecturing in higher education is evolving and that teachers are increasingly attempting to make lectures more student-centered.

Problem-based Learning (PBL): According to Wood [44], realistic problems are the starting point for this teaching method, which students use to develop their own learning goals. The students then worked independently to acquire the knowledge, which they subsequently shared and consolidated within the group. The aim of this method is to build knowledge rather than directly solve the problem. Problem-based learning is also used in higher education [42].

Case Study Method (CSM): A common didactic approach in academic teaching of outsourcing ecosystems is the case study method [15, 18, 23, 35], in which learners analyze a given case in context, discuss it, and develop their own solution.

Reverse Case Study (RCS): Reverse case studies are being used for the first time in nursing education. In Beyer's scenario [5], student groups developed a reverse case study in the form of a concept folder based on a short case scenario and a list of medications. In doing so, they systematically apply the nursing process, integrate prior knowledge with new content, and thereby foster evidence-based critical thinking and problem-solving skills.

Collaborative Learning (CL): According to Laal and Laal [29], this method is an educational approach to teaching and learning. It involves groups of learners working together to solve a problem, complete a task, or create a product. This method presents both social and emotional challenges for learners, as they must learn to discuss and argue. This allows learners to create their own conceptual frameworks and thus not rely exclusively on the frameworks provided by an expert or a text. A group must consist of at least two people, so this method

encompasses both peer learning and group learning. The use of collaborative learning in higher education is being investigated by several studies [20, 39].

Seminar-based Learning (SBL): Zeng et al. [45] describe that in this method, students work in small groups to discuss assigned questions and topics under the guidance of a lecturer. The aim here is to promote learning through discussion and examination of practical issues. To this end, students must prepare content and research answers to share these findings with the class during the seminar. Students engage in discussions, thereby learning listening skills, scientific questioning, and cooperation. Rana et al. [37] investigated the use of seminars in higher education. They examined the reasons why seminars are used, how they are implemented, what benefits they offer participants and academic institutions, and what challenges are associated with their implementation.

E-Learning (E-L): Kumar Bask et al. [28] define e-learning as anything that supports learning through electronic tools and media. Additionally they made a further distinction between mobile learning (m-learning) and digital learning (d-learning). Mobile learning encompasses learning using mobile devices. D-learning encompasses all forms of learning that are supported by technical tools or enabled by the targeted use of technology-based teaching methods. It can be applied in all areas of education and subject areas. Furthermore, they refer to the hybrid approach as blended learning, which is a combination of face-to-face learning and online learning. This represents an alternative to exclusively online teaching. E-learning is also used in higher education. The study by Ellis et al. [14], for example, shows how students perceive e-learning.

Flipped Classroom (FC): Bishop and Verleger [6] define the flipped classroom as a learning method consisting of two components. This consists of interactive group activities in the classroom on the one hand and computer-based individual instruction in the form of videos outside the classroom on the other. They consider the concept of using videos as an activity outside of class to be mandatory. For this reason, they have excluded all definitions that interpret the term too broadly and thus suggest that assigning reading tasks outside of class and discussions in class constitute the flipped classroom. The flipped classroom is also used in higher education. The study by Al-Samarraie et al. [3] found that the use of the flipped classroom in various subject areas helped to promote student engagement, metacognition, attitude, performance, understanding, and outcomes, as well as other learning outcomes.

Experiential Learning (EL): Kolb [26] describes learning as the process by which knowledge is created through the transformation of experiences. According to Kolb, learning can therefore be considered an ongoing process in which knowledge is not simply acquired but constantly recreated. In addition, experiences should be processed both subjectively and objectively. To truly understand learning, one must first understand what knowledge is. For experiential learning, Kolb presents a cycle comprising four steps: (1) concrete experience, (2) reflective observation, (3) abstract conceptualization, and (4) active experimentation. In the first step, the learner has a concrete experience. Then, in the second step, the learner reflects on this experience. In the third step, the learner

derives theories or concepts from their observations. Finally, in the fourth step, the new concepts are tested in practice, which in turn generates new experiences. This cycle is also used in higher education [1, 19].

Game-based Learning (GBL): Plass et al. [34] consolidate several sources and describe game-based learning as an approach where games are used specifically for the learning process and the game is linked to clearly defined goals. This can be a game in either digital or analog format. In this learning method, the entire learning activity is designed as a game. This is intended to increase students' intrinsic motivation. Gamification is distinct from this, whereby the actual task remains unchanged and is supplemented by game elements such as point systems or rewards. The study by Crocco et al. [8] showed that game-based learning in higher education can both improve deep learning and increase enjoyment.

Inquiry-based Learning (IBL): According to the consolidated summary of several sources by Pedaste et al. [32], inquiry-based learning is a learning strategy where students use methods and approaches that professional scientists use to construct their own knowledge. The aim is to discover new causal relationships by formulating hypotheses, observations, and experiments. It is therefore a combination of inductive and deductive learning with a focus on problem solving and the application of various problem-solving skills. The study by Aditomo et al. [2] shows that inquiry-based learning is also used in higher education.

2.3 (Dis)advantages of the Didactic Approaches

This section lists a maximum of three advantages and disadvantages from the literature for each teaching approach to answer the second part of RQ2. The focus of this article is on the teaching approach we have developed. Consequently, the aim is only to provide an overview of the various advantages and disadvantages of the different teaching methods. The advantages and disadvantages are shown in Table 1.

There are many other advantages and disadvantages that can be found in literature. However, Table 1 provides a good overview of the key aspects of the individual teaching methods. As already described in Section 2.2, the teaching and learning methods are mainly student-centered approaches. It is noticeable that student-centered approaches in particular are designed to enhance critical thinking and problem-solving skills, as well as independent work. In addition, most approaches are carried out in small groups, which can simultaneously improve collaborative work. These are important skills that are required later in professional life [9]. One disadvantage of student-centered approaches is often the greater amount of time required for both learners and teachers. In contrast to normal lectures, teachers must also be open to creative work by students that deviates from their initial sample solution.

Table 1. Didactic approaches (DA) and their (dis)advantages.

DA	Advantages	Disadvantages
LBL	- Efficient for large numbers of students [36] - Efficient for covering large amounts of information [36]	- No learner responsibility [36] - Low student engagement [36] - Short-term learning only [36]
PBL	- Practical learning [24] - Promotes transferable skills [24] - Strengthening learner responsibility [24]	- Less structured knowledge [24] - Gaps in subject coverage [24] - High time investment required [24]
CSM	- Covers remembering, understanding, and applying [41] - Highly adaptable [41] - Developing questioning skills [18]	- Lack of higher-order thinking [41] - Variable case complexity [30]
RCS	- Covers remembering, understanding, and applying [41] - Higher-order thinking [41] - Promotes teamwork [4]	- No single solution [5]
CL	- Enhances communication skills [22] - Increases motivation and participation [22] - Effective learning and understanding [22]	- Teamwork can be distracting [22] - Collaboration slows completion [22] - Task distribution difficulties [22]
SBL	- Promotes active learning [45] - Knowledge gathering skills [45] - Develops communication and collaboration skills [45]	- Increased learning load [45]
E-L	- Time flexibility [38] - Location independence [38] - Recordings available [38]	- Environmental distractions [38] - Technical issues [38] - Limited teacher communication [38]
FC	- Active student participation [43] - Immediate feedback [43] - Students develop and discuss questions [43]	- Dependence on student preparation [43] - High initial effort for teachers [43] - Mandatory online–classroom alignment [43]
EL	- Focus on learning and adaptation processes [26] - Learning through experience [26]	- All phases necessary but not always feasible [26]
GBL	- Fun combined with learning [16] - Safe learning environment [16] - Assessment-based feedback on learning needs [16]	- Lack of repetition options [16] - Rewarding effort rather than learning reduces motivation [16] - Time-consuming preparation [16]
IBL	- Promotes independence and responsibility [17] - Deeper understanding [17] - Critical thinking and problem-solving skills [17]	- Minimally guided instruction [25]

3 Methodology

This paper adapts the concept of the reverse case study and thus uses a problem-based learning approach. In addition, students work in small groups, so collaborative learning is another part of our teaching approach. Furthermore, the course is completely digital and therefore also includes e-learning. Initially, there is also a lecture-based teaching block that provides an introduction to the topic. This paper is methodologically based on the Design Science Research Methodology (DSRM) according to Peffers et al. [33]. The research process follows the iterative cycle of problem identification, target definition, artifact design, demonstration, evaluation, and communication. The central artifact of the work is a didactic concept, which is evaluated based on master's-level academic courses. The didactic concept presented in this paper has already been applied for two years in a row. The resulting findings can be found in Section 5. The evaluation of the master's course is based on the development of the grade point average and the experiences communicated by individual students, as well as our observations. At the end of the semester, students who have participated in the course will be sent an evaluation form to assess the course. However, the response rate was too low to include the results of the evaluation forms in this article.

4 Didactic Concept

This section outlines a didactic concept for teaching outsourcing ecosystem, combining several teaching methods. A major component is the idea of the reverse case study. The students' task is to develop a (reverse) case study based on DIN SPEC 1041, which supplements and expands the basic framework of the specification in an application-oriented manner. The aim of the task is to reverse-engineer a real-world outsourcing case based on DIN SPEC 1041. In this way, students should learn how to apply an abstract specification in practice. Table 2 shows the schedule for the master's course.

Table 2. Schedule of the course.

Week	Steps	Task	Type	Time
1	Onboarding/Exploration	Mentoring	Plenary Session	3.5 h
2	Onboarding/Exploration	Mentoring	Plenary Session	3.5 h
3	Onboarding/Adaptation	Mentoring	Plenary Session	3.5 h
4	Onboarding/Adaptation	Mentoring	Plenary Session	3.5 h
5	Adaptation	Case Study Concept	Feedback	15 min/group
6	Adaptation	Concept Presentation	Plenary Session	15 min/group
7-9	Analysis	Case Study Analysis	Group work	-
10	Evaluation	Analysis Presentation	Plenary Session	45 min/group
11	Evaluation	Analysis Presentation	Plenary Session	45 min/group

The entire course lasts eleven weeks. The procedural didactical model of the course consists of five overlapping steps, which are performed 100% digitally. The

online meeting tool Zoom is used to conduct sessions. For this purpose, a Zoom channel for the course was first created, and all students who have registered for the master's course were added to it.

As part of the course, students must complete three assessments: (1) case study concept and concept presentation, (2) case study analysis, (3) analysis presentation as shown in Fig. 1. Each piece of work is assessed according to three criteria: content, form, and organization. A maximum of 100 points can be achieved in the course. The case study concept and concept presentation accounts for 25% of the overall grade. The case study analysis accounts for (50%) and the anaylsis presentation (25%) and thus accounts for 75% of the overall grade.

Assessment	Subtotal	Criterion	Points
Case Study Concept and Concept Presentation	25	Content	15
		Form	5
		Organization	5
Case Study Analysis	50	Content	30
		Form	10
		Organization	10
Analysis Presentation	25	Content	15
		Form	5
		Organization	5
Total Points	100		100

Fig. 1. Evaluation scheme.

The five steps of the procedural didactical model are described below as follows:

- **Onboarding:** In this step, students receive an introduction to the topic of outsourcing in four initial sessions. These are dates on which the entire plenary session is involved (all students plus the lecturers). Each session is scheduled to last 3.5 hours. The aim of these four initial sessions is to help the students to gain an initial understanding of the topic of outsourcing ecosystems. DIN SPEC 1041 forms the basis for mentoring. First, DIN SPEC 1041 is classified in the context of outsourcing. Subsequently, the four phases of the outsourcing phase model are explained in detail. In addition, students receive supplementary digital resources to further deepen their knowledge (including videos, presentation slides, and additional specifications).
- **Exploration:** In this step, students form groups with a maximum of five members. This step overlaps with "Onboarding" as group formation is possible from the first week onward. At the latest, the groups must be formed by the end of the second week. If this has not been done by this point, it will no longer be possible to take the exam in this course. Students may register either as a complete group or individually. Those registering individually will be randomly assigned to a group. Subsequently, a separate Zoom channel is created for each group, with the lecturer and all group members as participants. This channel can be used for individual questions. In addition,

the small groups must upload their results there. After successfully forming groups, the groups can select a suitable use case either by researching the literature or by contacting a company directly. This is an iterative process that involves students and lecturers reviewing the use cases for their didactic suitability for the application of DIN SPEC 1041. Practice-based cases are particularly interesting, as they are rarely or not documented at all. This makes conducting the case study analysis much more difficult. Therefore, the increased level of difficulty is considered in the assessment. The students should not be disadvantaged compared to students who have chosen a use case from literature.

- **Adaptation:** In this step, students develop a detailed case description based on their selected use case and consolidate the identified materials. This step also overlaps with "Onboarding" as the case study concept can be started immediately after the groups have been successfully formed. Practice-based cases are generally preferred as they are less structured than literature-based cases and therefore require greater analytical and problem-solving skills. The case study concept for the feedback meeting must be completed by the end of the fourth week at the latest. Only the group itself and the lecturer are involved in the feedback discussions of the individual groups. Therefore, each group is offered a time slot of a maximum of 15 minutes. In addition, a buffer of 5 minutes is included in the schedule. Before this date, the groups must send their finished slide sets, consisting of a maximum of 10 slides, to the lecturers via their Zoom channel at least one day before the feedback date. This feedback session is intended to prevent students from working on the reverse case study with the wrong focus. The groups then incorporate the feedback into their concept, create a 5 minute video presentation and write a 10-page report on their case study concept. The video is then presented to the entire plenary session in week six. Each group will again have a maximum of 15 minutes for this. After the video, the remaining 10 minutes can be used for constructive feedback from the lecturers and the plenary. After this step, the first 25% of the course is complete.
- **Analysis:** In this step, the groups should develop the artifacts of their reverse case study based on their case description and DIN SPEC 1041. This step is referred to as case study analysis. In contrast to the case study concept, the groups work independently on their case study analysis in weeks 7-9. This time, no additional feedback session will be offered. However, each group can contact the lecturers via their personal Zoom channel if they have any questions. Students must produce a report of a maximum of 50 pages and a video presentation not exceeding 15 minutes. In terms of content, students should develop a didactic concept that they can use to explain to an inexperienced person how outsourcing projects can be implemented based on DIN SPEC 1041. The chosen didactic approach has a significant influence on the final grade. Apart from the formal requirements regarding length and that the documentation must meet the requirements of academic work, students do not receive any further guidelines regarding content. The final video presentation and report must be uploaded to the Zoom group channel

by the end of the ninth week at the latest. These two pieces of coursework account for the remaining 75% of the overall grade.

– **Evaluation:** This step represents the completion of the course in the 10th or 11th week. Depending on how many students are enrolled in the course, 10 or 11 weeks are required to complete the entire course. All groups present their 15-minute video presentations in plenary and in front of invited experts. Afterward, each group receives valuable feedback from the instructors and experts. A maximum of 45 minutes is scheduled for each group. After the video presentation and feedback, the remaining time can be used for engaging discussions. Finally, students are given the opportunity to critically reflect on the course content and structure in a plenary session and to complete an evaluation form.

5 Evaluation

The didactic approach presented here has already been tested twice in a master's course at the University of Hamburg. A comprehensive evaluation through a student survey has not yet been carried out. However, not enough students participated in the course evaluation, which takes place at the end of each semester, to be able to present representative results here. The first course had 41 students, who were divided into a total of eight groups with a maximum of five people each. The following year, the course had 31 students, who were divided into five groups of five people each and one group of six people.

In the first attempt, the case study concept described above was not implemented as a separate performance assessment. Instead, students began the case study analysis directly. As a result, some work did not meet the required standards. However, as this problem was evident in all groups, the concept had to be adjusted. This resulted in the final didactic approach described in Section 4. Due to the ambiguities in the processing of the reverse case study, this was considered in the grading. Accordingly, the assignment was graded based on how the students understood the task. Fig. 2 shows the grades of the first course. The average grade was 2.33, which can be attributed to adjustments in the grading scale. One group was unable to successfully complete the course and failed.

Grade	1.0	1.3	1.7	2.0	2.3	2.7	3.0	3.3	3.7	4.0	5.0
Number	0	5	11	0	16	5	0	0	0	0	4

Fig. 2. Grade table of first course.

On the second attempt, the average grade was 1.98, and all students passed. This can be seen in the grade table in Fig. 3. Due to the introduction of the case study concept and the included feedback session, the grading did not need to be adjusted further. Nevertheless, the grade point average and the quality of the reverse case studies had improved compared to the first time.

Grade	1.0	1.3	1.7	2.0	2.3	2.7	3.0	3.3	3.7	4.0	5.0
Number	6	0	10	0	5	10	0	0	0	0	0

Fig. 3. Grade table of second course.

6 Discussion and Conclusion

The presented didactic approach is a combination of various teaching methods (including reverse case study, problem-based learning, e-learning, and collaborative learning) with a primary focus on the concept of the reverse case study. This approach incorporates both teacher-centered and student-centered elements. The article shows that every didactic approach has its advantages and disadvantages. Therefore, it cannot be claimed that a single teaching method surpasses all others. The didactic approach presented in this paper enabled students to engage intensively with outsourcing ecosystems by combining theoretical and practical engagement with DIN SPEC 1041, while the reverse case study effectively structures this highly abstract topic into a more engaging format.

The article addresses the three research questions as follows:

- RQ1: The article outlines five specifications concerning outsourcing ecosystems. We used DIN SPEC 1041 [10] as an example for our teaching case, as it is based on a well-structured procedural model coordinated and elaborated by scientific researchers in collaboration with domain experts.
- RQ2: The literature presents a wide variety of different didactic teaching methods [1, 5–7, 15, 28, 29, 32, 34, 44, 45]. Numerous teaching methods exist today, but many are combinations of the approaches discussed in this paper, including our own didactic method. Therefore, the eleven teaching methods presented should be considered representative rather than exhaustive, as a complete classification exceeds the scope of this article. The analysis also shows that all methods have both advantages and disadvantages, with a clear tendency toward student-centered rather than teacher-centered approaches.
- RQ3: The didactic approach presented in this paper offers the advantage that a large group of students can be supervised. Students learn to work independently, collaborate in teams, and transfer knowledge. This promoted higher-order thinking skills such as analyzing, evaluating, and creating, according to Bloom's taxonomy [27]. However, students should also be prepared for the job market. This requires both social skills, such as teamwork and collaboration, as well as cognitive skills, such as problem-solving and research [9]. Students will later encounter colleagues with varying levels of commitment, making it valuable to practice collaboration and independent problem-solving in such situations. Our approach fosters social and cognitive skills by encouraging teamwork, autonomous thinking, and handling complex tasks without step-by-step guidance, while a digital reverse-learning format enables participation from any location.

Despite the chosen approach, some limitations should be considered. The specifications identified provide an overview without claiming to be complete.

Similarly, the identification of didactic approaches was based on an unstructured search, which limits the completeness of the findings. Furthermore, the advantages and disadvantages of the teaching methods identified in this paper provide only an overview. The didactic approach has not yet been evaluated through a systematic survey and therefore lacks empirical assessment.

During implementation, it became clear that teachers must balance guidance with student autonomy. The initial lack of early feedback in the first cohort led to weaker results, while adding a performance assessment with a feedback session significantly improved work quality. Students also reported deeper engagement with the topic compared to traditional lectures. Future work should include empirical evaluation of this didactic approach.

References

1. Abdulwahed, M., Nagy, Z.K.: Applying kolb's experiential learning cycle for laboratory education. Journal of Engineering Education **98**(3), 283–294 (2009). https://doi.org/10.1002/j.2168-9830.2009.tb01025.x
2. Aditomo, A., Goodyear, P., Bliuc, A.M., Ellis, R.A.: Inquiry-based learning in higher education: Principal forms, educational objectives, and disciplinary variations. Studies in Higher Education **38**(9), 1239–1258 (2013). https://doi.org/10.1080/03075079.2011.616584
3. Al-Samarraie, H., Shamsuddin, A., Alzahrani, A.I.: A flipped classroom model in higher education: A review of the evidence across disciplines. Educational Technology Research and Development **68**(3), 1017–1051 (2020). https://doi.org/10.1007/s11423-019-09718-8
4. Atkinson, T.N.: The "reverse case study:" enhancing creativity in case-based instruction in leadership studies. Journal of Leadership Education **13**(3), 118–128 (2014). https://doi.org/10.12806/V13/I3/A3
5. Beyer, D.A.: Reverse case study: To think like a nurse. Journal of Nursing Education **50**(1), 48–50 (2011)
6. Bishop, J., Verleger, M.A.: The flipped classroom: A survey of the research. In: 2013 ASEE Annual Conference & Exposition Proceedings. ASEE Conferences, Atlanta, Georgia (2013)
7. Burkill, S., Dyer, S.R., Stone, M.: Lecturing in higher education in further education settings. Journal of Further and Higher Education **32**(4), 321–331 (2008). https://doi.org/10.1080/03098770802392915
8. Crocco, F., Offenholley, K., Hernandez, C.: A proof-of-concept study of game-based learning in higher education. Simulation & Gaming **47**(4), 403–422 (2016). https://doi.org/10.1177/1046878116632484
9. Deming, D., Kahn, L.B.: Skill requirements across firms and labor markets: Evidence from job postings for professionals. Journal of Labor Economics **36**(S1), S337–S369 (2018). https://doi.org/10.1086/694106
10. Deutsches Institut für Normung e. V. (DIN): DIN SPEC 1041:2010-05: Outsourcing of technology driven knowledge-intensive business services (2010)
11. Deutsches Institut für Normung e. V. (DIN): DIN SPEC 91289:2013-05: Benchmarking of outsourcing services and outsourcing providers (2013)
12. Deutsches Institut für Normung e. V. (DIN): DIN SPEC 66286:2014-07: Management of cloud computing solutions in small and medium enterprises (SME) (2014)

13. Deutsches Institut für Normung e. V. (DIN): DIN SPEC 33451:2015-06: Standards for service catalogues in the relationship between service providers and service client (2015)
14. Ellis, R.A., Ginns, P., Piggott, L.: E-learning in higher education: Some key aspects and their relationship to approaches to study. Higher Education Research & Development **28**(3), 303–318 (2009). https://doi.org/10.1080/07294360902839909
15. Fidel, R.: The case study method: A case study. Library and Information Science Research **6**(3), 273–288 (1984)
16. Furdu, I., Tomozei, C., Kose, U.: Pros and cons of gamification and gaming in the classroom. arXiv preprint arXiv:1708.09337 (2017). https://doi.org/10.48550/ARXIV.1708.09337
17. Gholam, A.: Inquiry-based learning: Student teachers' challenges and perceptions. Journal of Inquiry and Action in Education **10**(2) (2019)
18. Hammond, J.S.: Learning by the case method. Harvard Business School, Boston, MA (2002)
19. Healey, M., Jenkins, A.: Kolb's experiential learning theory and its application in geography in higher education. Journal of Geography **99**(5), 185–195 (2000). https://doi.org/10.1080/00221340008978967
20. de Hei, M.S.A., Strijbos, J.W., Sjoer, E., Admiraal, W.: Collaborative learning in higher education: Lecturers' practices and beliefs. Research Papers in Education **30**(2), 232–247 (2015). https://doi.org/10.1080/02671522.2014.908407
21. International Organization for Standardization (ISO): ISO 37500:2014: Guidance on outsourcing (2014)
22. Irzawati, I.: The pros and cons of integrating collaborative learning into lesson plan design. Progres Pendidikan **4**(1), 1–11 (2023). https://doi.org/10.29303/prospek.v4i1.325
23. Jaiswal, V., Levina, N.: J-trading: Full circle outsourcing. Journal of Information Technology Teaching Cases **2**(2), 61–70 (2012). https://doi.org/10.1057/jittc.2012.11
24. Jones, R.W.: Problem-based learning: Description, advantages, disadvantages, scenarios, and facilitation. Anaesthesia and Intensive Care **34**(4), 485–488 (2006). https://doi.org/10.1177/0310057X0603400417
25. Kirschner, P.A., Sweller, J., Clark, R.E.: Why minimal guidance during instruction does not work: An analysis of the failure of constructivist, discovery, problem-based, experiential, and inquiry-based teaching. Educational Psychologist **41**(2), 75–86 (2006). https://doi.org/10.1207/s15326985ep4102_1
26. Kolb, D.A.: Experimental learning: experience as the source of learning and development. FT press (1984)
27. Krathwohl, D.R.: A revision of bloom's taxonomy: An overview. Theory Into Practice **41**(4), 212–218 (2002). https://doi.org/10.1207/s15430421tip4104_2
28. Kumar Basak, S., Wotto, M., Bélanger, P.: E-learning, m-learning, and d-learning: Conceptual definition and comparative analysis. E-Learning and Digital Media **15**(4), 191–216 (2018). https://doi.org/10.1177/2042753018785180
29. Laal, M., Laal, M.: Collaborative learning: What is it? Procedia - Social and Behavioral Sciences **31**, 491–495 (2012). https://doi.org/10.1016/j.sbspro.2011.12.092
30. Mostert, M.P.: Challenges of case-based teaching. The Behavior Analyst Today **8**(4), 434–442 (2007). https://doi.org/10.1037/h0100632
31. Oshri, I., Kotlarsky, J., Willcocks, L.P. (eds.): Digital technologies for global sourcing of services: 14th international workshop on global sourcing of information technology and business processes, Global sourcing 2019, Obergurgl,

Austria, December 18–21, 2019, proceedings, Lecture Notes in Business Information Processing, vol. 410. Springer International Publishing, Cham (2020). https://doi.org/10.1007/978-3-030-66834-1
32. Pedaste, M., Mäeots, M., Siiman, L.A., De Jong, T., Van Riesen, S.A., Kamp, E.T., Manoli, C.C., Zacharia, Z.C., Tsourlidaki, E.: Phases of inquiry-based learning: Definitions and the inquiry cycle. Educational Research Review **14**, 47–61 (2015). https://doi.org/10.1016/j.edurev.2015.02.003
33. Peffers, K., Tuunanen, T., Rothenberger, M.A., Chatterjee, S.: A design science research methodology for information systems research. Journal of Management Information Systems **24**(3), 45–77 (2007). https://doi.org/10.2753/MIS0742-1222240302
34. Plass, J.L., Homer, B.D., Kinzer, C.K.: Foundations of game-based learning. Educational Psychologist **50**(4), 258–283 (2015). https://doi.org/10.1080/00461520.2015.1122533
35. Platt, R.G., Carper, W.B., McCool, M.: Outsourcing a high speed internet access project: An information technology class case study in three parts. Journal of Information Systems Education **21**(1), 15–26 (2010)
36. Poirier, T.I.: Is lecturing obsolete? advocating for high value transformative lecturing. American Journal of Pharmaceutical Education **81**(5), 83 (2017). https://doi.org/10.5688/ajpe81583
37. Rana, N.P., Dwivedi, Y.K., Al-Khowaiter, W.A.: Use of seminars for teaching and learning in higher education: Recommendations for business and management teaching. International Journal of Business Excellence **13**(2), 238–255 (2017). https://doi.org/10.1504/IJBEX.2017.086341
38. Saltan, F.: Blended learning experience of students participating pedagogical formation program: Advantages and limitation of blended education. International Journal of Higher Education **6**(1), 63–73 (2017). https://doi.org/10.5430/ijhe.v6n1p63
39. Scager, K., Boonstra, J., Peeters, T., Vulperhorst, J., Wiegant, F.: Collaborative learning in higher education: Evoking positive interdependence. CBE—Life Sciences Education **15**(4), ar69 (2016). https://doi.org/10.1187/cbe.16-07-0219
40. Serin, H.: A comparison of teacher-centered and student-centered approaches in educational settings. International Journal of Social Sciences & Educational Studies **5**(1), 164–167 (2018). https://doi.org/10.23918//ijsses.v5i1p164
41. Smallheer, B.A.: Reverse case study: A new perspective on an existing teaching strategy. Nurse Educator **41**(1), 7–8 (2016). https://doi.org/10.1097/NNE.0000000000000186
42. Surif, J., Ibrahim, N.H., Mokhtar, M.: Implementation of problem-based learning in higher education institutions and its impact on students' learning. PBL Across Cultures **66** (2013)
43. Tolks, D., Schäfer, C., Raupach, T., Kruse, L., Sarikas, A., Gerhardt-Szép, S., Klauer, G., Lemos, M., Fischer, M.R., Eichner, B., Sostmann, K., Hege, I.: An introduction to the inverted/flipped classroom model in education and advanced training in medicine and in the healthcare professions. GMS Journal for Medical Education **33**(3), Doc46 (2016). https://doi.org/10.3205/ZMA001045
44. Wood, D.F.: Problem based learning. BMJ **326**(7384), 328–330 (2003). https://doi.org/10.1136/bmj.326.7384.328
45. Zeng, H.L., Chen, D.X., Li, Q., Wang, X.Y.: Effects of seminar teaching method versus lecture-based learning in medical education: A meta-analysis of randomized controlled trials. Medical Teacher **42**(12), 1343–1349 (2020). https://doi.org/10.1080/0142159X.2020.1805100