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FROM RESEARCH-BASED TO CHALLENGE-BASED LEARNING: ENHANCING COMPETENCE DEVELOPMENT AT RUHR UNIVERSITY BOCHUM

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Abstract

Challenge-Based Learning (CBL) fosters problem-solving, collaboration, and entrepreneurial thinking by engaging students in real-world challenges with external stakeholders. Although it has been extensively promoted in European education policies, integrating CBL into research-intensive universities remains challenging. At Ruhr University Bochum (RUB), CBL was implemented within the UNIC alliance and the Stifterverband-funded project “Develop Your Entrepreneurial Skills.” RUB’s strong tradition of Research-Based Learning (RBL) called for an alignment of CBL with existing didactic principles. In a series of strategic discussions, RUB stakeholders developed a framework to integrate CBL into the RBL context. Key steps included defining stakeholder roles, creating a flexible 5-ECTS module within the interdisciplinary curriculum, and training faculty in coaching-oriented teaching. Support measures, such as professional development workshops and funding programs (CBL@RUB), ensured broad acceptance. A key component was to evaluate students’ competence gains with the help of a newly developed assessment tool based on the EntreComp framework. Pilot studies using this tool showed significant improvements in practical knowledge application, teamwork, and problem-solving. Collaboration with other universities, such as Malmö University, provided insights into best practices. CBL at RUB enhances student engagement and employability by bridging academic learning with real-world challenges. The experience demonstrates that CBL and RBL can coexist, creating a dynamic learning environment that prepares students for complex problem-solving beyond academia.

Keywords: Challenge-Based Learning, Research-Based Learning, Higher Education Didactics, Competence Development, Entrepreneurship Education, Interdisciplinary Learning, Student-Centered Teaching, Teaching Innovation

Sammanfattning

Utmaningsbaserat lärande (UBL) främjar problemlösning, samarbete och entreprenöriellt tänkande genom att engagera studenter i verkliga utmaningar med externa intressenter. Även om det har uppmuntrats flitigt i europeisk utbildningspolitik är det fortfarande en utmaning att integrera UBL i forskningsintensiva universitet. Vid Ruhruniversitetet i Bochum (RUB) implementerades UBL inom UNIC-alliansen och det Stifterverband-finansierade projektet "Develop Your Entrepreneurial Skills". RUB:s starka tradition av forskningsbaserat lärande (RBL) krävde en anpassning av UBL till befintliga didaktiska principer. I en serie strategiska diskussioner utvecklade RUB:s intressenter ett ramverk för att integrera UBL i RBL-kontexten. Viktiga steg inkluderade att definiera intressenternas roller, skapa en flexibel 5-ECTS-modul inom den tvärvetenskapliga läroplanen och utbilda lärare i coachningsorienterad undervisning. Stödåtgärder, såsom workshops för professionell utveckling och finansieringsprogram (CBL@RUB), säkerställde bred acceptans. En viktig komponent var att utvärdera studenternas kompetensutveckling med hjälp av ett nyutvecklat bedömningsverktyg baserat på EntreComp-ramverket. Pilotstudier med detta verktyg visade betydande förbättringar i praktisk kunskapstillämpning, lagarbete och problemlösning. Samarbete med andra universitet, såsom Malmö universitet, gav insikter i bästa praxis. UBL vid RUB stärker studenternas engagemang och anställningsbarhet genom att överbrygga akademiskt lärande med verkliga utmaningar. Erfarenheten visar att UBL och RBL kan samexistera och skapa en dynamisk lärmiljö som förbereder studenterna för komplex problemlösning bortom den akademiska världen.

Nyckelord: Utmaningsbaserat lärande, Forskningsbaserat lärande, Didaktik inom högre utbildning, Kompetensutveckling, Entreprenörskapsutbildning, Interdisciplinärt lärande, Studentcentrerad undervisning, Innovation i undervisning

Challenge-based learning: What is it and how can it be established?

Challenge-based learning (CBL) has gained attention as a teaching method in HE, particularly since EU publications highlighted its potential to promote lifelong learning “in order to maintain and acquire skills that allow full participation in society and successful transitions in the labor market.”¹

¹ Council Recommendation of 22 May 2018 on key competences for lifelong learning: [https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018H0604\(01\)](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018H0604(01)) (last access: 26.02.2025).

The 2018 European Council Recommendation on Key Competences cited above stresses that transversal “skills, such as problem solving, critical thinking, ability to cooperate, creativity, computational thinking, self-regulation are more essential than ever in our quickly changing society” need to play a major role in educational thinking.² Action 7 of the 2020 European “Skills Agenda for sustainable competitiveness, social fairness and resilience”³: “Increasing STEM graduates and fostering entrepreneurial and transversal skills” resulted in initiatives like D-Emind, centered on CBL, for the HE sector.⁴

The Council Recommendation lists “Entrepreneurship” among its eight key competences. Key competences are those whichever individual needs to a certain degree, but which no single person embraces completely. The EC paper counts the following abilities among them: “literacy, multilingualism, numerical, scientific and engineering skills, digital and technology-based competences, interpersonal skills, and the ability to adopt new competences, active citizenship, entrepreneurship, cultural awareness and expression.”⁵

While originating in the high-tech thinktanks of Silicon Valley,⁶ CBL became visible in HE through Malmö University⁷ which adopted it as a core method in 2013 (Christersson et.al 2022) – even before the European Union identified entrepreneurship education as a necessity. CBL gained relevance at Ruhr University Bochum (RUB) through the university’s involvement in UNIC, a European higher education alliance of universities in post-industrial transition, in which Malmö University also takes part since 2023. RUB faced several challenges when introducing CBL as a new teaching format. We overcame a good number of these challenges in the ambiance of a three-year teaching project (2021–2024) called ‘Develop your entrepreneurial skills – challenge-based teaching formats for innovative university teaching’.

The project was funded by a programme of the Stifterverband für die Deutsche Wissenschaft (an organization financed both by companies and by foundations whose aim it is to promote educational programmes primarily in the HE sector)⁸ which aimed to promote the teaching of entrepreneurial skills at German universities.

In 2021, RUB had already placed a strong focus on perceiving, systematizing and strengthening transfer and support of start-ups as university tasks. It was also clear that if students were to develop entrepreneurial skills and an entrepreneurial mindset, teaching in general needed to focus more on practical challenges. Not only did students clearly express a desire for more practical orientation in student and graduate surveys, but it also had been observed that challenge-based teaching formats could

² Ibid., C 189/2.

³ <https://epale.ec.europa.eu/en/resource-centre/content/skills-agenda-sustainable-competitiveness-social-fairness-and-resilience> (last access: 26.02.2025).

⁴ D-Emind is a EU resource accessible since February 2025 – a practical guide to CBL developed by several European universities under the guidance of the Centre de Recerca i Estudis pel Desenvolupament Organitzatiu (Bellaterra/Spain). <https://www.demind.eu/partners/> (last access: 24.02.25).

⁵ <https://education.ec.europa.eu/focus-topics/improving-quality/key-competences> (last access: 24.02.2025).

⁶ The CBL framework emerged from the “Apple Classrooms of Tomorrow—Today” (ACOT2) project:

https://www.challengebasedlearning.org/wp-content/uploads/2020/11/acot2_background.pdf

⁷ “Challenge based learning in higher education– A systematic literature review” in: *Innovations in Education and Teaching International* 2022, VOL. 59, NO. 5, 609–618.

⁸ together with the Dieter Schwarz Foundation and Campus Founders in cooperation with Allianz SE.

be used very well to dovetail the subject-related as well as the interdisciplinary acquisition of entrepreneurial skills. The wish to establish a new culture of entrepreneurship education naturally raised more questions than answers. Probably the most important challenge was to clarify what role CBL should play in future teaching at RUB, a university with (at that time) roundabout 40.000 students and 4.000 teachers. Although home of one of the finest centers for teaching and learning in Germany, the Zentrum für Wissenschaftsdidaktik (ZfW),⁹ which offers a certificate of Didactics in HE, teaching stands second to scientific excellence in the priority list of most researchers. Additionally, teaching at RUB follows the didactic principle of research-based learning (RBL), in which students and researchers gain new insights in an academic community, experience the research process together and fostering and promoting knowledge in a disciplinary and interdisciplinary way. The “Leitbild Lehre,”¹⁰ the mission statement for teaching, therefore, identifies research-based teaching and learning (“Forschendes Lernen”) as the key method to which RUB commits itself: “The method of RBL is the guiding principle of teaching at RUB. Students are confronted with research questions and methods at an early stage to grow into the role of researchers, while teachers encourage and accompany this process. In this way, students prepare to shape the future based on research.”¹¹ The ZfW regularly offers workshops together with the administrative Department for University Development and Strategy teaching this method, and the establishment of research modules is also supported by university funds.

With the aim of clarifying the role of CBL in this context at RUB, discussions took place between the Vice-Rector for Teaching and Studies, the Department for University Development and Strategy and the ZfW. After discussing the extent to which, for example, RBL and CBL could be reconciled and possibly combined, it was agreed that RUB teaching would continue to be guided by the principle of RBL, but also promote CBL as an important approach, particularly with regards to students’ transfer competence, and not only within the framework of this project. Stakeholders agreed that co-creation and collaboration with external, non-scientific partners are becoming increasingly important for teaching and research, as reflected in federal and EU research calls for proposals. CBL courses provide the ideal framework for involving students in relevant research and offering them the opportunity to develop ideas for solutions to entrepreneurial, social and/or cultural challenges. Accordingly, this definition of CBL was developed to accompany and support its introduction in the context of the Stifterverband project:

The key elements of CBL as defined by RUB are:

- Students work in heterogenous, interdisciplinary groups
- They work on “real-world problems”
- They collaborate with non-academic partners from outside university
- Teachers act as coaches rather than lecturers
- The focus is on the learning process, not on the product for the partner

The aim of the Stifterverband project (2021-2024) was to develop a flexible framework for a standard CBL course (5 ECTS) that could be filled by different modular offers from teachers and placed in the curriculum of the so-called “Optionalbereich”. The Optionalbereich (optional area) is a third curricular

⁹ <https://zfw.rub.de/>

¹⁰ <https://einrichtungen.ruhr-uni-bochum.de/sites/einrichtungen.ruhr-uni-bochum.de/files/2024-02/Leitbild%20Lehre-DE.pdf>

¹¹ Ibid, p. 1: “Die Methode des forschenden Lernens ist das Leitprinzip der Lehre an der RUB. Dabei werden Studierende schon früh mit Forschungsfragen und -methoden konfrontiert und wachsen im Verlauf ihres Studiums in die Rolle von Forschenden hinein, während Lehrende diesen Prozess anregen und begleiten. So bereiten sich Studierende darauf vor, die Zukunft wissenschaftsbasiert zu gestalten.”

branch complementing the regular 2-subject B.A. curriculum and offers the development of key competences such as languages, sustainability studies, data literacy, and entrepreneurship education. The format to be developed was to be based on the competences listed in the EU Entrecomp Framework (Figure 1).¹²

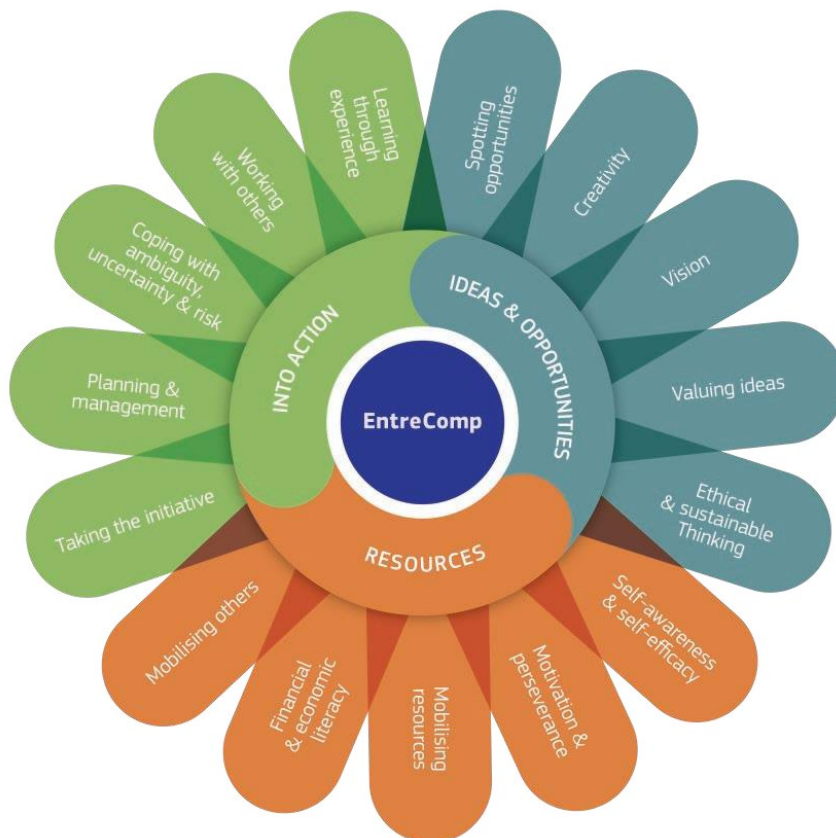


Figure 1: The EntreComp wheel 3 competence areas and 15 competences.
Source: <https://entreprcompeurope.eu>

We aimed to offer advice to teachers interested in trying out CBL and hoped that early adopters would share their knowledge and experiences, thus building a community of practice. Our challenge was to raise awareness of CBL's importance among RUB teaching personnel and convince them to incorporate the method in their teaching. The activities described below were key steps in establishing CBL formats at RUB.

Teacher interviews

To gain an overview of CBL activities in teaching at RUB, interviews were conducted with six lecturers/teams from different faculties and central facilities who had already integrated CBL elements into their course framework. The guideline-based interviews included the following topics

¹² <https://entreprcompeurope.eu/wp-content/uploads/EntreComp-A-Practical-Guide-English.pdf> (last access:26.02.2025).

- General information about the course taught
- Objectives within the subject-specific curriculum
- Integration of CBL elements in the course
- Workload and assessment
- Results and transfer

The results of the interviews showed that there was no standardized way of recruiting practice partners and integrating them and the challenge into teaching. It also became clear that the standard tool for teaching evaluation could not properly assess students' skill development in CBL courses and that there was no other standardized tool for doing so.

Network meeting

To raise awareness of CBL at RUB and to connect lecturers with CBL teaching experience, we established a network meeting that took place once per semester. The first one, held in November 2022, focused on exploring the format's characteristics and didactic potential using the Lego® Serious Play® method. After a warm-up, participants were challenged to use Lego to answer the question: "How do I visualize my practice of CBL?" The individual models were then combined into a shared version by contributing two components from each model, ensuring it was coherent and explainable to outsiders. The activity highlighted key CBL elements like process design, support options, collaboration, and more. The result is shown in Figure 2, and participants agreed on the following description of their model.

"Our ideal CBL course is grounded on strong scientific foundations and led by skilled teachers. Participants and teachers start and finish the project together (bottom left). The challenge is always at the center, developed through cooperation with external networks (spiderweb). The process, visualized by cogwheels, includes a final review (center, right) to ensure sustainability and added value, leading to a successful product. Unexpected connections may arise (connecting ribbon with cogwheels), but there are also potential pitfalls (shark in the middle). The final product is shared with the public/partners (knight in armor, top right, results visualized as treasure chest)."

After an initial workshop, network meetings focused on specific topics, such as interdisciplinarity as a challenge or CBL in teacher training, with an ongoing focus on support needed at RUB for CBL implementation.

Offers of support

After the interviews and the first network meeting, we had a good overview of which RUB lecturers already had experience with CBL courses, and who was generally interested in CBL and/or needed support with the initial implementation of a CBL course. We started to develop and implement customized support services. In addition to one-on-one counselling, a flexible module framework (5 ECTS) for CBL courses was developed which can be filled with various individual elements (hackathons, project learning, start-up camps, etc.) in combination with challenges provided by practice partners. In addition, the advanced training course 'Challenge-Based Learning: Solving real challenges with students' was developed and offered as part of the university didactics qualification of the ZfW.

The aim of the course is to familiarize lecturers with the principle of CBL and to provide them with didactic training for designing their own CBL courses. The course included a methodological discussion focusing on the adapted teacher role, an introduction to the module framework and the drafting of participants' own CBL courses.

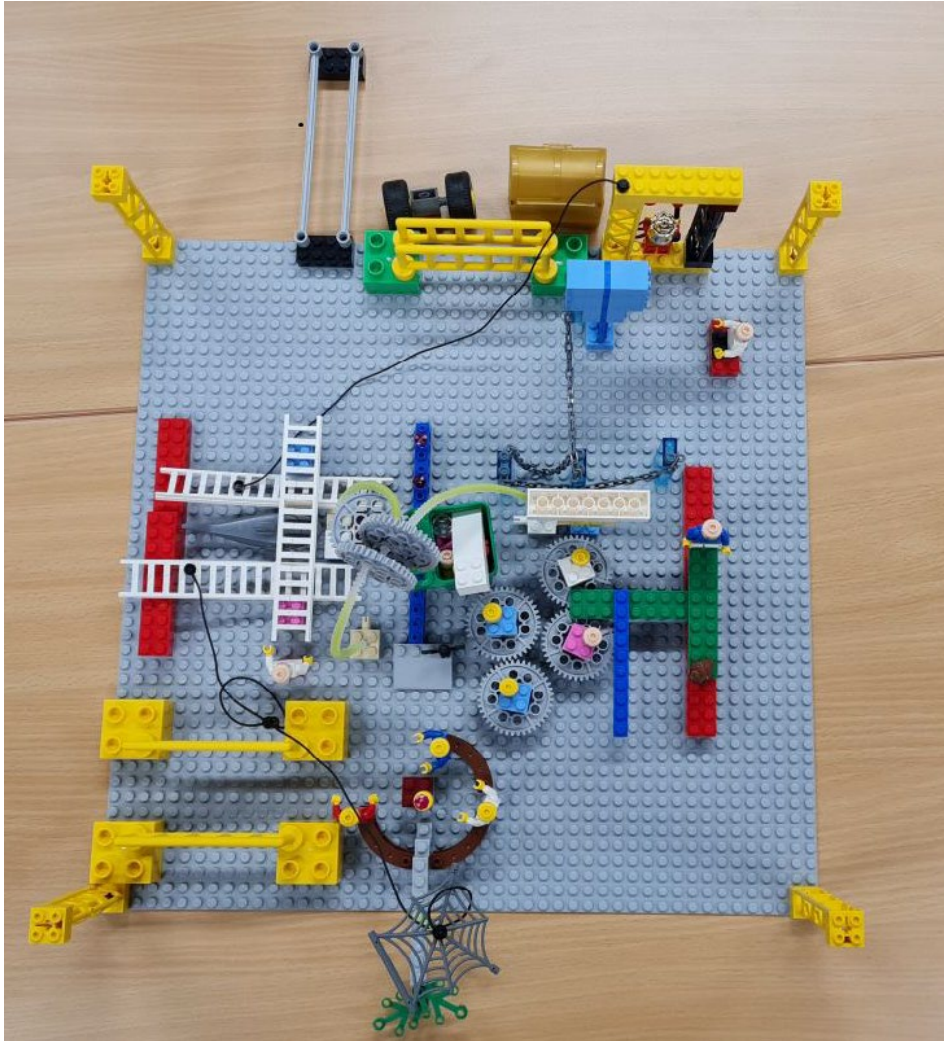


Figure 2: Lego® model of ideal CBL course at RUB as envisioned by teachers
Source: Jessica Lehmann

Publications

At the very beginning of the project, even before the joint methodological clarification with our colleagues at the ZfW, we, the project coordinators, published a document explaining what CBL is, why teachers should use CBL in the classroom, where the challenges that students work on can come from, and how the UNIC CityLabs can be used as a challenge provider. The document also showed what roles both students and teachers have in CBL courses and how these change over time. Apart from the

reference to the UNIC CityLabs, this document reflected the state of CBL at the time, without going into possible specifics at RUB.¹³ It also served as a basis for the discussions that were to follow.

With several years of experience from the project, we wrote an article for RUB's LehreLaden, a platform for innovative teaching resources. The aim was to provide long-term advice and practical guidance on CBL for the campus community and beyond.¹⁴

University funds

Since the implementation of a CBL course results in an additional effort for lecturers when compared to traditional seminars, the university fund 'CBL@RUB' was launched in April 2023. Lecturers could apply for support through this internal funding programme when they planned on implementing CBL courses. The fund offered to finance a student assistant, a teaching assignment or an excursion to the project partner outside campus. Setting up competitive university funds is a tried and tested means of promoting teaching innovation at RUB. The advantage of this approach is that real teaching innovations are promoted due to the competitive nature of the programme. In addition, the funding leads to an exchange within the faculties on the relevant topic, with the recipients acting as multipliers.

Nine CBL courses from different RUB faculties have been supported by the university funds, with one project being implemented as part of UNIC with colleagues from the University of Oulu. Descriptions of the nine projects can be found in the Lehrmuster database, which shows examples of good and innovative teaching at RUB.¹⁵ They have been instrumental in establishing CBL as a new form of teaching at RUB.

Evaluation of students' competence development in challenge-based learning courses

As described earlier, we conducted interviews with RUB lecturers who at the start of our project already had experience with the use of CBL in teaching. We wanted to gain insights into the ways in which CBL can be used in teaching, the resources that are needed, and how teachers can be specifically supported when integrating the method. The interviews also revealed that, although teachers unanimously thought that CBL methods helped their students build up competences, it was difficult to measure the added value of using CBL. Students also testified to the added value, but no empirical evidence had been established at RUB so far. To convince both the university management and the teaching staff to use CBL in teaching, one of the first activities of the project was to develop a questionnaire, based on the competences mentioned in the interviews and the EntreComp model, to evaluate the development of students' skills in CBL courses. Work on the evaluation tool took place in the winter semester 2022/23 together with colleagues and lecturers from Psychology and Economics. The questionnaire records competence development in the following standard categories:

- Professional competence

¹³ <https://lehrmuster.ruhr-uni-bochum.de/gestaltungsprinzipien/challenge-based-learning/>

¹⁴ See <https://lehreladen.rub.de/lehrformate-methoden/challenge-based-learning/>

¹⁵ See <https://lehrmuster.ruhr-uni-bochum.de/>

- Organisational competence
- Communication competence
- Cooperation competence
- Transfer competence
- Reflection competence

Depending on the focus of the course, the questionnaire can be expanded to include the following two additional categories:

- Interdisciplinary cooperation competence (for courses in which students from different degree programmes/faculties work together)
- International competence (for courses in which students from different countries work together)

The first pilot evaluation of a CBL course took place in the same winter term. Minor adjustments were made to the evaluation form based on feedback from students and lecturers.

According to the Göttingen Learning Success Evaluation, “the statements presented to the students for self-assessment [are] formulated in the first-person singular and rated on a six-point scale (1 = “completely true” to 6 = “not true at all”).”¹⁶ Students complete the evaluation form at the end of the course, where they are asked to indicate how they would have rated themselves in relation to each question at the beginning of the course and how they see themselves at the end of the course. “The learning success of the whole cohort of students is the mean change between the two survey dates.”¹⁷ [...] The learning outcome calculated in this way is expressed as a percentage. An increase of 100% is achieved when all students believe that they have fully achieved a learning objective after the course.”¹⁸ In contrast to the Göttingen Learning Success Evaluation, we decided to conduct the survey at the end of the course in order to make it easier to unambiguously attribute changes in competence to individual students and to avoid having students fill out the relatively long questionnaire twice.

The presentation of the results also follows the Göttingen Learning Success Evaluation (see Figure 3). “The bars on the left side of the graph show the mean of the students’ self-assessment before (red) and after (yellow) participation in the teaching module. On the right, the responses are broken down according to the six scale options. The last column shows the calculated percentage of learning success.”¹⁹

Since the summer semester of 2023, the questionnaire has been used in 13 CBL courses and completed by 130 students. Based on the standard categories of the questionnaire, the average learning success of the students in the 13 evaluated courses is as follows:

- Professional competence: 60,82%
- Organisational competence: 34,38%
- Communication competence: 24,87%

¹⁶ Raupach, Tobias und Sarah Schiekirka. W. J.: Handreichung zur Lernerfolgsevaluation. Electric Paper Evaluationssysteme GmbH.

¹⁷ See Raupach & Schiekirka for the exact calculation of the mean.

¹⁸ Ibid.

¹⁹ Ibid.

- Cooperation competence: 29,40%
- Transfer competence: 33,46%
- Reflection competence: 24,90%

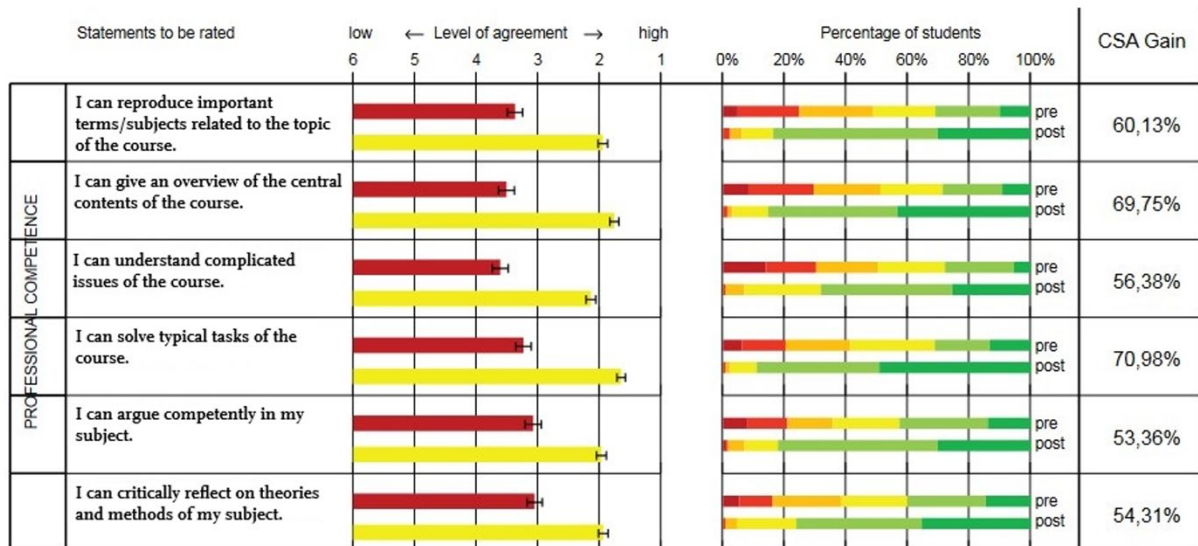


Figure 3: Change in students' professional competence in challenge-based learning courses
Source: Author's illustration

The lower learning success in the categories communication competence and reflection competence can be explained by the fact that in both categories the students already rated their previous knowledge as relatively high, and the learning success is perceived to be correspondingly lower.

While most items in the standard questionnaire showed increases in com35%, the increase in the category of professional competence was significantly higher than the average for all other items. In this category the gains ranged from about 53% to about 71%. These figures suggest that the combination of the use of previously acquired subject knowledge when working on the challenge, combined with the need to independently acquire further subject knowledge in order to formulate the specific challenge and fill in knowledge gaps in order to come up with a solution idea leads to students in CBL courses experiencing a significantly greater increase in the professional competence item than in all other categories.

The evaluation tool proved to be a strong argument for establishing or at least trying out the CBL method in HE settings, both at RUB and at other universities where we were able to present it (see below).

Direct exchange with colleagues

As this example shows, direct exchange with teachers and colleagues was essential for our project. The aim of this exchange was and is not only to raise awareness of CBL as a teaching method, but also to receive feedback and ideas on how to implement our own project. In addition to the above-mentioned CBL lecturer network, we have presented CBL as a topic at various RUB events:

At the end of November 2022, the Day of Innovative Teaching took place in the RUB Makerspace with a focus on entrepreneurship education. Representatives of all departments and institutions that are already active in the field of entrepreneurship education or are interested in this topic or professional exchange were invited, including us.

Once a year the RUB organizes the training series ‘How to Transfer’. Our CBL project team organized a training on transfer to/from teaching, which was very well attended. The aim of our workshop was to clarify what transfer from teaching means, what possibilities there are and what needs to be considered when someone is planning to organize a transfer-oriented course.

In addition to the exchange with colleagues at our own university, communication with representatives from other German universities was also very helpful. The Entrepreneurial Skills funding organization scheduled regular exchanges with representatives of other funded projects, with whom we were able to discuss difficulties and obstacles in our own project implementation and take away suggestions for improvement.

We also presented our project at the University Future Festival, the largest national event on the (digital) future of academic education in Germany, organized by the Hochschulforum Digitalisierung and the Stiftung Innovation in der Hochschullehre, where we were able to exchange ideas with representatives from other universities.

The exchange with international colleagues also played an important role in establishing CBL as a new form of teaching at RUB. This took place at the Teaching and Learning Forum of the European University Association. Here we presented our project and received helpful feedback from the participants. Many of the participating universities are also part of an EU university alliance that would like to establish CBL as a form of teaching in their network and were therefore in the same situation as we were.

One of the most important exchanges, however, was the contact with colleagues from Malmö University, which in recent years has been redesigning its university teaching to focus on CBL, with the aim of contributing to a global learning society and achieving the UN Sustainable Development Goals. The main purpose of the joint exchange with colleagues from the Centre for Teaching and Learning at Malmö University was to learn from them how CBL has been implemented as a guiding principle for teaching at the university, how all faculties and teaching staff have been involved in the journey, and how the design works in teaching.

This detailed description of individual measures – from the direct exchange with lecturers to the development of support services and the establishment of the university funds – is intended to show how much work and manpower is required to establish a new form of teaching such as CBL at a large university such as RUB with its 21 faculties. Even after several years of work, in which much has been achieved and great progress has been made, we must openly admit that we have not yet reached the end of this process.

Conclusion: Why is it worth integrating CBL formats into university teaching?

University students, today more than ever, harbor a thirst for relevance and experiences of self-efficacy. Traditional teaching formats rarely meet these demands²⁰ – but CBL does. The European Union not only promotes lifelong learning opportunities to enable learners of all ages and career stages to update their skills portfolio on an ongoing basis, but also supports structures of interdisciplinary, problem-based, participatory learning²¹ forms that actually meet the students' wishes, as well as economic and societal needs. The evaluation tool we developed proves that CBL formats meet these requirements.

While the implementation project has ended, entrepreneurship education at RUB continues through the Worldfactory Startup Center.²² Regular CBL courses are offered there as well as in the Faculty of Management and Economics and are generally open to all RUB students. Further CBL courses will be organized within the framework of the UNIC CityLabs. The CityLabs are organized in cooperation with the city of Bochum and interested researchers. Together they identify local challenges which the students deal with in CBL courses to develop ideas for solutions.

The lecturers whose courses were supported by our funds have reported about their teaching experiences – mostly enthusiastically. Teachers were impressed by the students, commitment to the challenge. Although CBL courses were perceived as time-consuming and labor-intensive, overall, they were also seen as rewarding and exciting. This was partly due to the fact that the approach taken in traditional seminars was reversed in CBL courses: it was not theory first and then relevance for practice but approaching theory from practice. “Thanks to the constant feedback in the form of exchange and reflection, the CBL seminar was able to progress as planned. The students enjoyed the change, and above all they were motivated to work in the specific field. During the seminar, they became more aware of the objectives, methods and structure. [...] It was particularly positive that the students were committed to finding a creative solution to the agreed challenge. The individual groups put a lot of effort into preparing the project and realized their projects with enthusiasm. It is always a challenge for students afterwards not to get stuck in the project experience alone. [...] However, the urge to research was stimulated and encouraged by feedback and further reflection from the seminar group as well as by individual group discussions. As a result, almost all groups were able to relate their chosen challenge and project back to a theoretical field and develop further questions.”²³

For students, CBL courses have two key advantages over traditional seminars: Firstly, “the opportunity to exchange ideas with experts in a workshop setting, which was perceived by the students as a great

²⁰ The course progression surveys (students in their 5th Bachelor's semester are surveyed) of recent years at RUB show that students find that practical and career-related elements such as a link between theory and practice, practice-related teaching content and opportunities to acquire key skills are only emphasised to an average extent in the subject. If we compare the results since the first study programme survey in 2016, this value has changed little. The results are also shared by graduates in the graduate survey (four to five years after graduation). In retrospect, the assessment of the practical and career-related elements of the degree programme is also rather average here. Accordingly, it can be deduced from the results that, parallel to the great efforts and the many improvements in practice-oriented teaching, student's expectations of practical relevance and self-efficacy have also increased, which means that the evaluations show no improvement in this area. For all RUB survey results see: <https://einrichtungen.ruhr-uni-bochum.de/de/befragungsergebnisse>

²¹ Communication on the European Skills Agenda:

https://epale.ec.europa.eu/sites/default/files/communication_30june_v2.pdf# (last access: 26.02.2025), p. 11.

²² <https://worldfactory.de/entrepreneurship-education> (last access: 26.02.2025).

²³ Dr Claudia Rammelt, research assistant at the Faculty of Protestant Theology at RUB, in the evaluation of her CBL course.

enrichment, to really gain insights into a professional practice and also to pick up some tips and tricks.”²⁴ And secondly, the perception of one’s own performance by people outside the university and the opportunity to make career-relevant contacts for life after graduation. For example, one of the CBL projects accompanied an international festival, the students published their own contributions. The presence of the students “during the festival and their contributions were recognized by an international professional audience. A professional audience that is always looking for new talent for magazines and many other positions. Participation in the festival can therefore be a door opener for a professional future.”²⁵

Compared to traditional seminars, CBL courses are perceived by both lecturers and students as more enriching, but also more labor-intensive:

The approach of the seminar is always challenging for the students: “Isolating and formulating challenges; generating problem-solving strategies; developing and implementing an appropriate project; linking theory and practice; reflecting on the challenges and opportunities facing society as a whole.”²⁶

For teachers, the workload increases, among other things, because project partners must be found, and agreements must be made with them. Team building in a large heterogeneous seminar group, the development of structures and the space for practicing also require more time. Accordingly, clear communication and corresponding communication structures are required to accommodate students with different levels of experience and to create communication on an equal footing for all participants.²⁷

Experiences from our project will be used to systematically gather knowledge about the implementation of CBL in teaching at RUB, to anchor CBL in teaching and thus to be able to use new developments in research in university teaching to process transfer requirements in or from non-university practice. If our goal is to support students in making the most of their potential and finding ways to deal with and ultimately solve complex problems, not only in the workplace, but also in societal constellations, we should integrate CBL into the HE curriculum. It is both stress and fun during the semester – and it works for life.

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²⁴ Mareike Gaubitz, lecturer at the Institute for Theatre Studies at the Faculty of Philology at RUB and Moritz Buschmann, Head of the FIDENA Research Centre, in the evaluation of their CBL course.

²⁵ Ibid.

²⁶ Dr. Claudia Rammelt, *ibid.*

²⁷ From the CBL course evaluations by Dr. Claudia Rammelt, Mareike Gaubitz and Moritz Buschmann.

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