

INTERPROFESSIONAL EDUCATION IN HEALTH SCIENCES PROGRAMMES: ENABLING COMPETENCE DEVELOPMENT THROUGH CONSTRUCTIVE ALIGNMENT

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Abstract

This study examines how interprofessional education in higher education can be designed coherently to foster interprofessional action competence. Drawing on the framework of Constructive Alignment, the study investigates how learning outcomes, teaching methods, and assessment formats can be aligned to support the development of professional, methodological, social, and self-competence. Based on qualitatively analysed interviews with lecturers, the study explores how interprofessional education is implemented in practice and how students' prior experience and practical training components, including peer-to-peer learning formats, are integrated into learning processes. The study addresses the research question: How can teaching in higher education be designed in accordance with constructive alignment to promote the development of interprofessional action competence?

1 From knowledge to action competence: Didactic design of interprofessional education through constructive alignment

In higher education, a fundamental shift is taking place away from mere knowledge transmission and towards the promotion of sustainable competencies that are relevant to professional and societal life (Huber & Reinmann, 2019). The overarching learning outcome is not only the acquisition of professional, methodological, social, or personal competencies, but also, increasingly, the resulting action competence. This understanding of competence links cognitive aspects with the motivational, volitional, and social readiness to act in variable action situations (Weinert, 2001). Competencies therefore include not only theoretical knowledge, but also its application in variable action situations, referred to as *knowledge-in-action* (Hartz et al., 2022). In this context, didactic-methodological concepts associated with pedagogical constructivism represent a suitable approach, as they view learning as an active process of knowledge construction. Particular

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emphasis is placed on problem- and case-oriented learning formats, cooperative learning arrangements, and authentic, practice-based tasks in which knowledge is constructed through application, interaction, and reflection (Dennick, 2016). Teaching and learning formats based on constructivist principles can promote collaborative, context-related learning and cooperative problem-solving among participants from different health professions (Choi et al., 2024). Learning outcomes, however, must be defined and operationalised in advance to ensure that they are effectively achieved (Huber & Reinmann, 2019). These approaches are closely linked to constructive alignment, in which learning outcomes, teaching methods, and assessment formats are coherently aligned (Biggs, 2014), thereby enabling learners to understand and actively participate in knowledge construction on the basis of transparent learning outcomes.

Such teaching and learning settings offer opportunities to apply action competencies in variable action situations, particularly in the context of interprofessional collaboration. Interprofessional teaching and learning is increasingly recognised in health professions and medical education as a prerequisite for patient-centred and future-oriented collaboration in healthcare and is implemented within the framework of interprofessional education (Reeves et al., 2017). The aim of interprofessional teaching is to develop interprofessional competence, which is manifested, for example, in joint performance when addressing complex problems as part of professional and methodological competence (Walkenhorst & Hollweg, 2023). Against this background, Oevermann (2000, as cited in Glässel, 2024, p. 4) emphasises the importance of capturing individual logics of action, whose diverse contextual factors exclude purely monoprofessional care. In interprofessional learning, a shared understanding of cases supports the coordination of treatment plans and contributes to more effective care (Langberg et al., 2019; Berchtold et al., 2020). Real case scenarios are therefore particularly suitable for interprofessional teaching and learning formats, as they support competence acquisition and allow content, teaching methods, and assessment formats to be aligned with the respective case situations (Glässel, 2024).

Three developments in didactic design are particularly relevant: the inverted classroom approach creates equal starting conditions and supports preparation for targeted competence development (van Diggele et al., 2020). Online teaching formats, as well as practice-oriented settings such as interprofessional training wards, further promote interprofessional education (Kaap-Fröhlich et al., 2022). Through the targeted alignment of learning outcomes, methods, and assessments in line with constructive alignment, learners can actively construct and apply knowledge. In this regard, the article indicates that interprofessional action competencies in higher education can be developed effectively through constructivist, practice-based, and cooperative learning formats in interprofessional education.

2 Interprofessional teaching in health sciences programmes

The increasing complexity of healthcare requires not only knowledge, but also the ability to apply this knowledge in variable action situations and, for example, to collaborate interprofessionally with other professional groups. Against this background, the *Framework for Action on Interprofessional Education and Collaborative Practice* provides a structural foundation that emphasises the practice-oriented design of teaching and learning formats and distinguishes between interprofessional teaching (interprofessional education) and interprofessional collaborative practice (World Health Organization, 2010).

The implementation of interprofessional education aims to systematically prepare learners for interprofessional collaboration (Gerber & Rüefli, 2021). Members of different health professions are expected to learn about, from, and with each other in order to improve outcomes (Walkenhorst & Hollweg, 2023), promote collaboration in complex care systems, and support the acquisition of interprofessional competencies (Ortloff et al., 2026; Kaap-Fröhlich et al., 2022). Although interprofessional education has gained importance in health sciences programmes, monoprofessional teaching and learning formats provide only limited preparation for interprofessional collaboration (Sottas, 2016). This can occur even at universities where several faculties are present on campus (Behrend, 2024). At institutions that primarily view teaching as vocational training, the increasing specialisation and differentiation of professional groups further

complicate interprofessional collaboration (Nauerth, 2024). It follows that the effectiveness of interprofessional education does not depend solely on the transmission of professional content, but also on deliberate design in line with constructive alignment, using practice-oriented teaching and learning formats that systematically promote the competencies to be acquired by participants (learning outcomes) and assess them accordingly. Defining these learning outcomes is a particular challenge, as not all participants acquire the same competencies (Thistlethwaite & Moran, 2010). Interprofessional teaching and learning formats particularly foster reflection on one's own professional role, the roles of others, and issues at professional interfaces (Dahmen et al., 2016). As part of planning and implementation, instructors have a significant responsibility for preparing learners for interprofessional collaboration (Porter & Nandan, 2017, as cited in Walkenhorst & Hollweg, 2023, p. 2). Formats such as peer teaching are particularly suitable for acquiring practical skills, preparing for exams, promoting role understanding, and supporting theory-practice transfer (Vogel et al., 2019). At the same time, they can be used to deepen case understanding through realistic practice scenarios integrated into teaching and assessment formats (Glässel, 2024). Regarding the implementation of interprofessional education, Alharbi et al. (2025) conclude in their systematic review that simulation- and practice-oriented formats offer the greatest potential to promote interprofessional competencies, but require sufficient resources for interaction among learners from different disciplines. To use this potential sustainably, Pitout et al. (2025) also recommend integrating interprofessional education formats into existing modules, thereby conserving resources and fostering interprofessional collaboration in the long term. Consequently, constructive alignment should be used as a design framework for interprofessional education to ensure that practice-oriented teaching and assessment formats make interprofessional learning outcomes transparent to both instructors and learners across different health sciences programmes and actively engage them in their joint implementation.

3 Interprofessional competence development

According to Weinert's (2001) classic pedagogical and psychological understanding of competence, competencies are defined as the cognitive abilities and skills available to, or acquired by, individuals to solve problems, as well as the necessary motivational, volitional, and social attitudes required to apply these solutions successfully and responsibly in variable situations. In the academic literature, numerous, partly discipline-specific interpretations of the concept of competence exist, and broader consideration of these areas is needed because they overlap, influence one another, and gain significance depending on environmental changes (Schöning & Mendel, 2021). At the same time, Mannonen et al. (2025) mapped the field of competence research and showed that many definitions share common core components, frequently referring to the integration of knowledge, skills, and attitudes as the basis for effective action in specific contexts. The competence areas according to Pfäffli (2005, as cited in Schöning & Mendel, 2021, p. 105), with a focus on higher education pedagogy, can be defined as:

- Professional competence: Encompasses subject-specific knowledge and the skills necessary to perform professional tasks appropriately.
- Methodological competence: Refers to cognitive abilities, such as problem-solving and decision-making that enable independent work.
- Social competence: Includes communicative and cooperative skills required for successful collaboration.
- Self- or personal competence: Relates to personal qualities, such as conscientiousness, as well as the capacity for emotional and motivational self-regulation.

Action competence arises from the interplay of these four competence areas and encompasses the ability to act appropriately, reflectively, and responsibly in different contexts (Kultusministerkonferenz, 2018). Moreover, this model is applied in higher education, particularly in connection with the implementation of the CORE principle (Competence Oriented Research and Education) and the competence-oriented reform of study programmes (Rósza et al., 2017).

Walkenhorst & Hollweg (2023) emphasise, regarding interprofessional education, that interprofessional competencies manifest in joint performance. For private universities with a focus on inverted classrooms and online formats, the question arises of how competence acquisition can be deliberately structured through constructive alignment. In line with constructivist competence models, action competence is primarily attributed to learners and refers to the situation-appropriate integration of professional, methodological, social, and personal competencies. Constructive alignment aims to foster this action competence through the coherent alignment of intended learning outcomes, teaching methods, and assessment formats, thereby enabling learners to apply and reflect on their knowledge in variable interprofessional practice situations. With regard to instructors, it is assumed that they possess the necessary disciplinary and didactic competencies to translate these learning outcomes into coherent teaching-learning arrangements. This assumption simultaneously constitutes a theoretical premise and a potential limitation, as the effective implementation of Constructive Alignment presupposes appropriate professional development and collaborative capacity among the involved instructors.

4 Methodological approach

Within the German higher education landscape, this paper explores how constructive alignment, as a didactic design principle, can contribute to the development and implementation of interprofessional teaching-learning formats. In Germany, there are 423 universities, of which 110 are privately funded (Hachmeister, 2025), offering programmes with diverse and sometimes innovative teaching and learning formats. Kehm (2022) describes the private university sector as particularly heterogeneous in terms of student profiles, practical relevance, networks, seminar groups, and supervision. However, there is currently no evidence as to whether private universities are more flexible in responding to societal trends and integrating them into teaching and learning concepts. Within the framework of the collaborative project “Factors influencing innovative teaching and learning concepts at private universities [translated from German]” between the Technical University of Dortmund and the University of Witten/Herdecke, funded by the German Federal Ministry of Education and Research, a focus is placed on the implementation of interprofessional education and the research question: How can higher education teaching be designed in accordance with the principle of constructive alignment to promote the development of interprofessional action competence?

As part of the project, 16 full-time lecturers at private universities were interviewed between September 2024 and February 2025 using a semi-structured interview guide to systematically capture their experiences and expectations regarding interprofessional education. The sample of respondents was highly heterogeneous in terms of age, gender, disciplinary background, and teaching and professional experience, reflecting the real collaborations found at many universities and practice settings. The interviewees were asked about the following issues:

- Which learning outcomes do you associate with your teaching activities within interprofessional education?
- What is your perception of the significance of competency development in your teaching?
- Which competencies should be acquired through teaching and learning formats to prepare students for interprofessional collaboration after graduation?
- How is interprofessional teaching implemented within the programme, and how is competency acquisition assessed?

The interviews were conducted via Zoom, transcribed using MAXQDA 24, anonymised according to the publication-oriented strategy proposed by Reichertz (2015), and subsequently analysed using the structured content analysis method developed by Kuckartz (2016). The interviews were first read in full; relevant passages were clustered, and then coded. The qualitative data analysis was guided by the central quality criteria for qualitative research outlined by Steinke (2009).

The rule-guided analytical process was supported by a structured interview guide and a systematic coding procedure. Categories were developed iteratively and continuously checked against the empirical material. To ensure intersubjective comprehensibility, the process was transparently documented, and interpretations remained close to the data. Communicative validation was also conducted with the interviewees to assess the plausibility of the interpretations. Deductive categories were based on Pfäffli's (2005, as cited in Schöning & Mendel, 2021, p. 105) competence model, which encompasses professional, methodological, social, and personal competencies. These were complemented by inductively developed dimensions derived from the transcribed interviews and categorised according to the authors' definitions (see Results, Section 5.1 - 5.4). To analyse how lecturers prepare students for interprofessional education using inverted classroom learning formats (Table 5), implement these in interactive teaching-learning formats (Table 6), and employ assessment formats (Table 7), corresponding inductive categories were developed from the material. No quantification of text passages was performed. The coding system was iteratively refined and reviewed by two additional researchers to support consistency and transparency. This approach ensured a clear, systematic progression from raw data to results and integrated both deductive and inductive categories. Figure 1 illustrates this process using two examples: Example 1 shows a literal assignment of a text passage to a dimension, whereas Example 2 shows a paraphrased assignment of a text passage to a dimension.

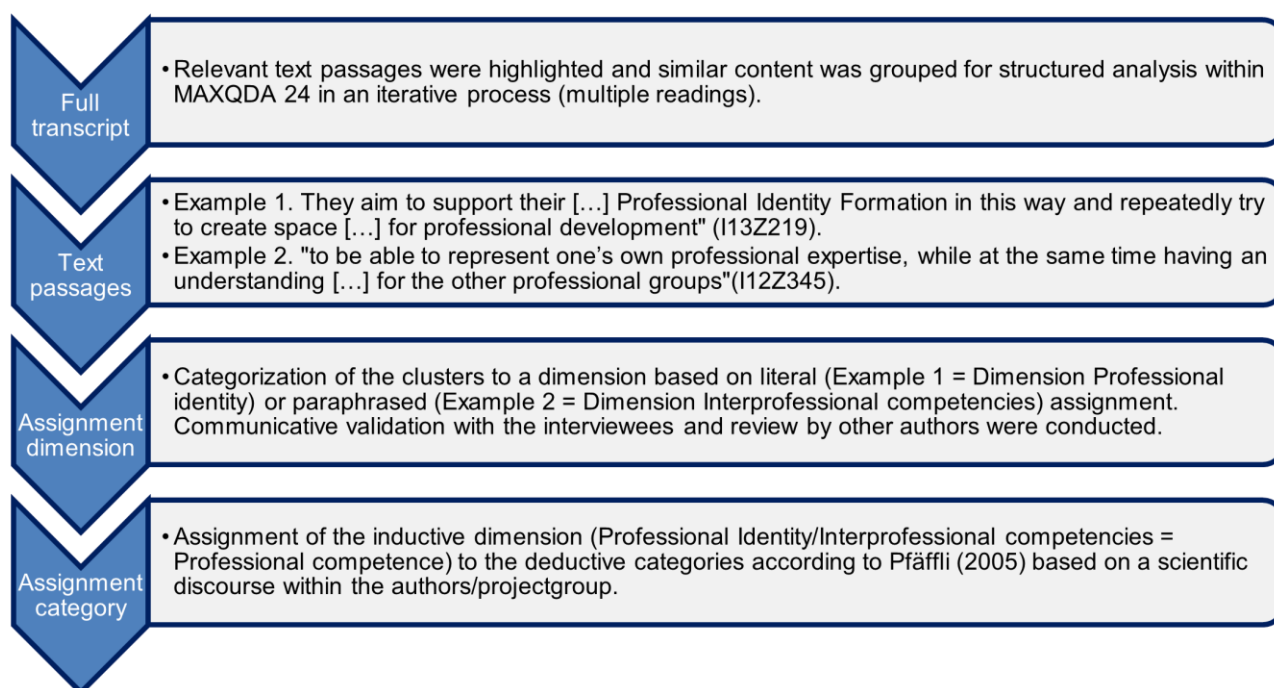


Figure 1. Example of the data analysis process

5 Results

The inductive dimensions derived from the qualitative content analysis were assigned, based on their definitions, to the competence areas described in Section 3 (professional, methodological, social, and self- or personal competence) according to Pfäffli (2005, as cited in Schöning & Mendel, 2021, p. 105) and are presented below. Additionally, it is shown how the interviewees design and implement interprofessional education in accordance with constructive alignment.

5.1 Professional competence

The analysis shows that professional competence was understood as a central qualification encompassing not only knowledge, but also its application and action competence, and that it is

closely linked to methodological skills and contextual knowledge. Table 1 summarises the key aspects of professional competence derived from the interview codes (I) and provides the line numbers (Z); the quotations were translated into English by the author.

Table 1. Dimensions of the category “professional competence”

<i>Dimension</i>	<i>Definition</i>	<i>Anchor example</i>	<i>Interview codes</i>
Theory-practice transfer	To apply a theory in practice and extract insights from practice	„This of course presupposes specific or module-specific professional knowledge that the students possess, but also the competencies to analyze data, theories, and models, to be able to apply them, and to draw conclusions from them“ (I15Z119).	I3Z157 I4Z207 I7Z289 I12Z314 I15Z119
Contextual knowledge	To consider the conditions, contexts, and settings of future professional practice	"...that they also implement what they are supposed to learn, that is, to apply what they have learned in the contexts in which they will work in the future, meaning the different settings and various work contexts" (I14Z211).	I5Z273 I14Z211
Interprofessional competencies	To take into account one's own and other professions' role perceptions	"to be able to represent one's own professional expertise, while at the same time having an understanding [...] for the other professional groups" (I12Z345).	I6Z254 I13Z219
Professional identity	Formation of professional identity and values	They aim to support their [...] Professional Identity Formation in this way and repeatedly try to create space [...] for professional development" (I13Z219).	I3Z241 I5Z386 I12Z345 I13Z219 I14Z341 I15Z140

The interviewees emphasised theory-practice transfer. Students should be able to reproduce content by drawing conclusions from theories and data and applying them (I3Z157, I15Z119), possess both foundational knowledge in their field (I7Z289) as well as theoretical concepts and fundamentals (I4Z207), and have practical competencies to work in their respective professions (I12Z314). Contextual knowledge also refers to a basic understanding of data literacy and the functioning of language models (I5Z285), as well as the ability to apply evidence-based knowledge in different work contexts (I14Z211). Interprofessional competencies are described in relation to Professional Identity Formation (I13Z219), differentiation from the role of reference disciplines (I14Z341), and future skills and transformative competencies (I6Z254). Statements regarding professional self-concept include, in addition to value pluralism and mental flexibility (I5Z386), the ability to develop a mindset (I3Z241), academic self-efficacy (I3Z240), and the handling of conflicting information (I15Z140).

5.2 Methodological competence

The interviewees viewed methodological competence as a central key qualification and as the foundation of professional action competence, which is conveyed in a practice-oriented, reflective, and application-related manner and is closely linked to professional competence. Table 2 presents the dimensions coded from the interviews.

Table 2. Dimension of the category “methodological competence”

<i>Dimension</i>	<i>Definition</i>	<i>Anchor example</i>	<i>Interview codes</i>
Scientific Work	Acquire the ability to work scientifically	“...so to speak, the ability to conduct a scientific analysis of issues” (I15Z177).	I1Z275 I2Z298 I3Z95/195 I7Z290 I8Z645 I9Z521 I15Z117
Understanding structures, designing them, and working systematically	Be able to systematically design, apply, and evaluate a theory-practice transfer or process.	“To work systematically; that is, to investigate a question - whether in the classical scientific sense or arising from professional practice - in a systematic way” (I8Z322).	I2Z529 I5Z277 I8Z322 I14Z220

According to the statements, methodological competence encompasses both formal and subject-related skills and is closely linked to an understanding of theory, enabling students to make informed decisions. The statements refer to the ability to conduct scientific analyses of issues (I15Z117), statistics (I1Z275) and computational models (I9Z521), citation methods (I2Z298) and academic writing (I3Z95), the application of models and hypotheses (I3Z195), experimental understanding (I7Z290), as well as systematically addressing a question or problem (I8Z322). Regarding the subcategory “understanding structures, designing, and acting systematically,” the interviewees mentioned the development of research designs and questionnaires (I2Z529), the knowledge required to verify hypotheses and apply appropriate technologies (I5Z277), the use of artificial intelligence (I8Z645), and the transfer of knowledge from theory to mechanisms in practice (I14Z220).

5.3 Social competence

The interviewees’ statement indicate that social competence is closely interrelated with other competence areas. One interviewee emphasises that it is about “not only developing professional competencies but also communication skills and organisational competencies” (I10Z241). Table 3 presents the dimensions of social competence.

Table 3. Dimension of the category “social competence”

<i>Dimension</i>	<i>Definition</i>	<i>Anchor example</i>	<i>Interview codes</i>
Collaboration with other professions	Apply manners, recognize the needs of other professions, evaluate contents, and make decisions	„So first you see different working cultures. You learn to communicate. You learn and see how the colleagues communicate with each other. You see good examples and bad examples“ (I14Z301).	I3Z448/742 I4Z205 I5Z334 I7Z295 I9Z579 I10Z299 I14Z301
Collaboration with patients	Perception of needs, actions, and their reflection with regard to interaction with patients	“that perception changes in experts compared to non-experts, meaning that students must also be able to recognize what is happening in everyday situations, interpret it accordingly, and develop perception and action processes” (I3Z370).	I1Z70 I3Z370 I13Z281

In the interviews, social competence was primarily associated with the ability to communicate with other professional groups (I4Z205, I14Z301), teamwork (I9Z579), and conflict management (I3Z742). In addition, reflection skills (I5Z334), emotion regulation (I3Z448), critical evaluation and decision-making competence (I7Z295), and the ability to recognise the needs or requirements of

other professions (I10Z299) are considered cross-cutting competencies. Beyond perceptual and action processes (I3Z370), social competence also refers to collaboration (I1Z70) and the establishment of relationships with patients (I13Z281).

5.4 Self- or personal competence

Regarding self-competence, the interviewees emphasise the personal development of students. This requires a supportive learning environment, facilitated by reflective (I6Z259, I7Z454) and interactive (I5Z199, I7Z221, I10Z358) learning formats that promote exchange among students (I3Z672) and take place in small groups (I9Z124, I11Z439, I12Z438). Table 4 presents the statements on self-competence.

Table 4. Dimensions of the category “self- or personal competence”

<i>Dimension</i>	<i>Definition</i>	<i>Anchor example</i>	<i>Interview codes</i>
Personal competencies	Development of personal competencies	“This means that students should be able to form their own understanding of a phenomenon or a situation [...] that is, they should be enabled to develop solutions themselves” (I9Z358).	I4Z279 I9Z358 I13Z214 I15Z125

Overall, the interviewees viewed self-competence as a fundamental element of student development, and its promotion occurs implicitly yet purposefully. Within personal competencies, the interviewees differentiated between organisational and time-management (I4Z279), the development of personal skills and attitudes (I13Z214) to independently develop solutions (I9Z358), and the preparedness to evaluate options, manage changes, and draw practice-relevant conclusions (I15Z125).

5.5 Interprofessional competence in practice

The analysis shows that the four competence areas are considered relevant for interprofessional collaboration by the interviewees, and that students can draw on their prior professional training. One interviewee described this as follows: “the strongest point of connection for interprofessional collaboration is that so many students bring their own professional training” (I13Z257). Against this background, the acquisition of interprofessional competencies can be deliberately planned by integrating students’ existing professional experiences – or the absence of such training – into the structuring of learning outcomes, teaching, and assessment formats in accordance with constructive alignment (Biggs, 2014).

Learning outcome: From the interviews, interprofessional action competence can be derived as an overarching learning outcome from the four competence areas described by Pfäffli (2005, as cited in Schöning & Mendel, 2021, p. 105). For the interviewees, this included both confidently representing one’s own professional expertise and understanding other professional groups. Central to this is the theory-practice transfer to real care situations, which students should adapt depending on contextual knowledge and apply using interprofessional competencies (Table 1). Through the acquisition of methodological competence and structured approaches, interprofessional work processes can be reflected on, optimised, and transferred to different settings. Scientific work also enables students to critically analyse interprofessional processes and design them based on evidence (Table 2). Social competence encompasses the ability to communicate with other professional groups or patients, recognise the needs of other professions, and make joint decisions (Table 3). Furthermore, organisational and time management skills promote the development of personal skills and attitudes, as well as constructive, context-appropriate handling of change. In this way, self-competence enables students to make decisions and assume responsibility in interprofessional contexts (Table 4).

Teaching and learning formats: The results show that interprofessional teaching is delivered, among other methods, through asynchronous self-learning formats in line with an inverted classroom

approach. The interviewees frequently referred to study guides and scripts, as well as teaching videos and audio formats (Table 5). These are complemented by interactive teaching and learning formats (Table 6). According to the interviewees, the proportion of digital learning units is increasing, as they can be pragmatically adapted through integrated tools and short update cycles (I7Z218). In this approach, the initial input is delivered asynchronously, whereas practice, transfer, and reflection primarily take place in person (I13Z608). Another example is lecture recordings, which provide students with the added value of being able to review and refresh content flexibly (I6Z548).

Table 5. Inverted classroom learning formats in interprofessional education

Category	Teaching and learning formats	Anchor example	Interview codes
Inverted Classroom	Study materials & lecture notes	"In study booklets this is handled in various ways [...] - we show examples of how it works in practice, or we start with a practical problem and explore what theory can reveal about it"(I3Z864).	I1Z335 I2Z132 I3Z905 I7Z222 I9Z302 I10Z169
	Recordings, instructional videos & audio formats	"Short videos that we produce ourselves. They are used to deliver tiny pieces of information in a concise manner(I2Z135).	I1Z335 I2Z123 I3Z192 I5Z194 I6Z583 I7Z222 I9Z320 I10Z346 I11Z301 I12Z738 I14Z476 I15Z355
	Additional offerings via an online campus	"there are many variants. To summarize again: asynchronous digital learning units"(I7Z238).	I2Z214 I3Z635 I5Z499 I7Z464 I10Z442 I12Z471 I16Z421

As further offerings provided through an online campus, the interviewees mentioned personal accounts with chat functions (I7Z464), forums (I3Z635), group sessions via Teams (I2Z214), test questions and quizzes (I5Z499), and discipline-specific learning platforms such as Amboss, Moodle, and Articulate (I7Z220, I16Z421). With regard to interactive teaching and learning formats, both internal and external formats were mentioned (Table 6).

Table 6. Interactive learning formats in interprofessional education

Category	Teaching and learning formats	Anchor example	Interview codes
Interactive teaching and learning formats	Research-based learning (parallel to the in-person sessions)	"This means that students first engage in the project and need to plan, carry out, and analyze their experiment" (I3Z672).	I1Z478 I3Z672 I6Z334 I15Z378
	In-person sessions	"I would say that we try to align the tasks in other modules as closely as possible to practice [...] for example, in the case of interprofessional care and collaboration" (I8Z354).	I1Z540 I2Z167 I3Z556/874 I5Z457 I6Z432/542 I7Z221 I10Z174 I12Z349/371 I14Z510 I15Z231/235
	External university formats	"We have an internship where students are allowed to visit a variety of learning sites" (I16Z665).	I3Z467 I4Z348 I8Z626 I10Z273/530 I14Z236 I16Z665

The interviewees differentiated research-based learning into empirical research seminars (I1Z482), psychological experiments (I3Z210), and research (I6Z334) or research-intensive projects (I15Z378). Collaboration and exchange in face-to-face sessions were facilitated through mixed learning groups (I3Z874), joint case studies (I5Z457, I6Z432, I12Z349), simulated case conferences (I12Z371), role-playing with simulated patients (I14Z510, I15Z231), podcasts (I7Z221), virtual laboratories (I10Z174), and simulation-based settings using conversational bots (I2Z167). The interviewees emphasised the potential of group work (I3Z615, I5Z342, I7Z236, I11Z512, I15Z263). These are complemented by sprint events (I1Z540), informal discussion rounds (I3Z556), marketplaces for projects and research initiatives (I6Z542), and open science practices (I15Z235). In addition to internships (I8Z626, I13Z530, I14Z236, I16Z665), the external formats mentioned included research projects (I3Z467), project work (I4Z348), and project-based collaborations with external partners (I10Z273).

Assessment formats: A similarly broad spectrum is observed in assessment formats for interprofessional education, which are conducted in both written and oral forms (Table 7).

Table 7. Assessment formats in interprofessional education

Category	Teaching and learning formats	Anchor example	Interview codes
Written test	Project assignments	"When they have to write project reports, they are already very close to practice (...) for example, in the case of interprofessional care and collaboration. Yes, and they should include practical examples. So at least some transfer of knowledge is happening" (I8Z491).	I3Z181 I4Z343 I5Z416 I6Z542 I7Z592 I8Z491 I9Z578 I10Z277 I15Z162

Table 7. Assessment formats in interprofessional education (continued)

Category	Teaching and learning formats	Anchor example	Interview codes
Oral test	Presentations including peer feedback	"In the interprofessional collaboration module, I try to promote this (...) by including assessments (...) and having them present something, introduce themselves, and present it to their colleagues" (I8Z483).	I3Z210
			I4Z348 I6Z348 I7Z234 I8Z483 I13Z626

According to the interviewees, assessment tasks related to the written documentation of project work (I5Z416, I7Z592, I8Z491, I9Z578, I10Z277), joint research in clinical practice (I15Z162), scientific surveys (I6Z542), the development of business models (I4Z343), and case assignments in practice projects (I3Z181). One interviewee stated: "when they have to write the project reports [...] we of course try to orient them very closely to practice, so that in the case of interprofessional collaboration [...] they also bring in examples from practice" (I8Z491). Oral examinations are conducted through planning, performing, and presenting psychological experiments (I3Z210), business models and their progress (I4Z348), presentations of case assignments from internships (I8Z483), the students' existing work context (I6Z348), as well as group work (I7Z234) and practical assessments of conversations with simulated patients (I13Z626). This was expressed as follows: "in the module on interprofessional collaboration, I naturally try to promote this theoretically [...] a subject presentation in this case [...] where they also introduce themselves and present it to their colleagues" (I8Z383). The interviewees emphasised the relevance of peer feedback (I4Z592, I5Z421, I7Z339, I13Z639, I14Z450). One interviewee succinctly described this as follows: "So the assessment in a course where [...] the competence to work interprofessionally is in the foreground [...] is designed so that the students are in communication" (I12Z402). The results illustrate how learning outcomes for interprofessional education (e.g., competence acquisition, Tables 1-4) are implemented through corresponding teaching and learning formats (Tables 5 and 6) using selected assessment formats (Table 7) in accordance with constructive alignment, as described by the interviewees (Figure 2).

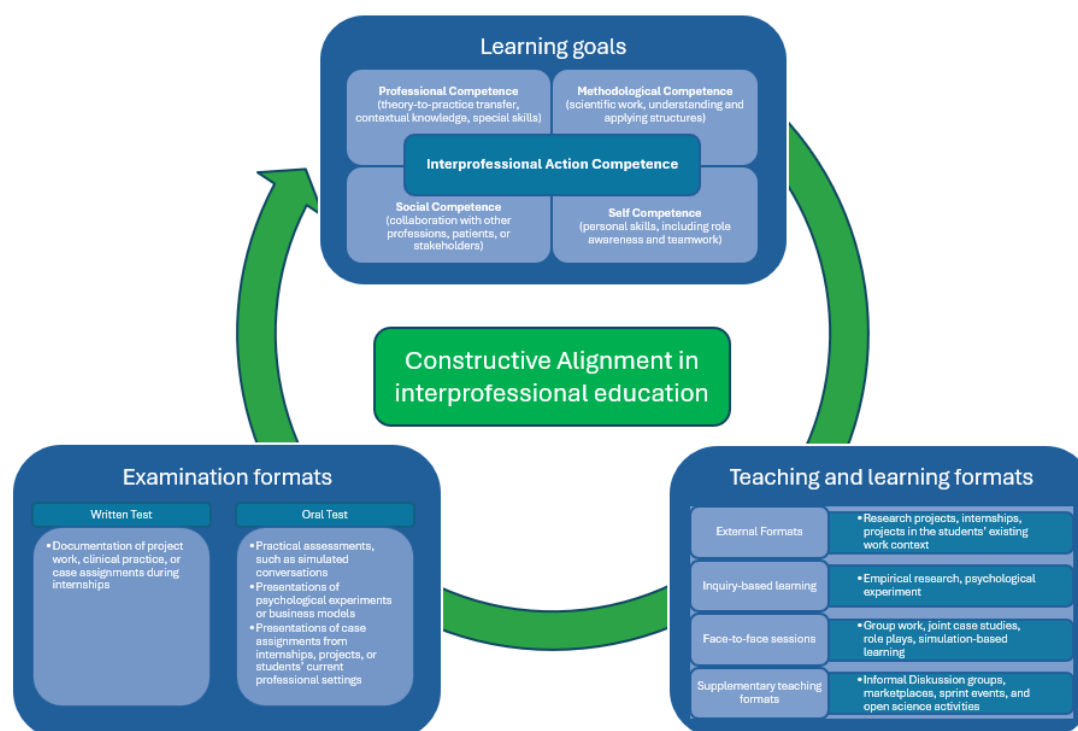


Figure 2. Constructive Alignment in interprofessional education: Own illustration, based on a previous publication

6 Discussion

The results show that interprofessional education was considered relevant by the interviewees for the development of interprofessional action competence. Instructors can define individual competence development as a goal (Kaap-Fröhlich et al., 2022) and, as Porter & Nandan (2017, as cited in Walkenhorst & Hollweg, 2023, p. 2) state, assume responsibility for planning and implementation so that students are prepared for interprofessional collaboration (Gerber & Rüefli, 2021). The interviewees reported that the teaching and learning formats enable students, among other things, to communicate with each other (I14Z301), recognise the needs of other professions (I10Z299), and promote exchange among themselves (I3Z672). This aligns with criteria identified in the literature (Walkenhorst & Hollweg, 2023; Reeves, 2017; World Health Organization, 2010), according to which interprofessional education occurs when learners from different professions learn about, from, and with each other to improve collaboration and outcomes. For the didactic implementation of interprofessional education, the theoretical framework of constructive alignment (Biggs, 2014) provides a systematic basis: learning outcomes, teaching methods, and assessment formats are coherently aligned so that competence acquisition occurs intentionally rather than incidentally.

6.1 Developing competence as a teaching goal

The 16 interviewees emphasised the importance of professional, methodological, social, and self-competence in deliberately preparing students for professional practice. For the development of interprofessional action competence, theory-practice transfer, professional role understanding, contextual knowledge, and cross-disciplinary skills (Table 1) were particularly targeted and complemented by scientific work and a systematic approach (Table 2). Furthermore, the focus was on fostering students' ability to collaborate with other professions and patients (Table 3) and on developing personal competencies (Table 4) as focuses. Accordingly, all competence areas according to Pfäffli (2005, as cited in Schöning & Mendel, 2021, p. 105) are addressed so that students can develop interprofessional action competence as an overarching competence (Kultusministerkonferenz, 2018). This multidimensional approach reflects broader competence research, which conceptualises competence as an integrative construct combining knowledge, skills, and attitudes that enable effective action in complex professional contexts (Mannonen et al., 2025). The present results support Hartz et al.'s (2022) assertion that knowledge in action and its application in variable action situations can already be acquired during studies through interprofessional education. Theoretically, this aligns with Weinert's (2001) understanding of competence as an interplay of cognitive, motivational, and social components. With a focus on individual competence acquisition, where not all students learn the same (Thistlethwaite & Moran, 2010), the interviewees highlighted learning outcomes in line with transformation in higher education (Huber & Reinmann, 2019), which go beyond mere knowledge transmission to foster professionally and socially relevant competencies. The reflection on one's own and cross-professional roles, as described by Dahmen et al. (2016), is specifically promoted according to the interviewees (Table 1). Contrary to the assumption that the specialisation and differentiation of professional groups hinder interprofessional collaboration (Nauerth, 2024), the interviews indicate that students' professional backgrounds provide a central access point to interprofessional learning (I13Z257). In this context, it remains to be discussed what advantages and disadvantages heterogeneous student groups with varying professional experience bring, as well as the role of available resources and teacher competencies.

The need for a broader consideration of competence areas (Schöning & Mendel, 2021) is also evident by the interviewees' statements. For example, regarding contextual knowledge, the interviewees emphasised that professional and methodological competences should not be considered in isolation (I14Z211), as these competence areas are closely interlinked (Tables 1 and 2). Social competencies such as communication skills (I4Z205, I14Z301), teamwork (I9Z579), and conflict management (I3Z742) were rated as central by the interviewees and are also reflected in international frameworks for interprofessional education (Ortloff et al., 2026; Kaap-Fröhlich et al., 2022). Overall, the results demonstrate that the deliberate promotion of professional,

methodological, social, and personal competencies through integrated teaching and learning formats effectively supports the development of interprofessional action competence.

6.2 Instructional formats in interprofessional education

Joint performance in collaboratively solving complex problems (Walkenhorst & Hollweg, 2023) is addressed in various internal and external teaching and learning formats at universities. The interviewees' statements (e.g., I6Z254, I7Z289, I13Z219) support Vogel et al.'s (2019) assertion that peer-teaching formats promote role understanding and theory-practice transfer. Preparatory measures include inverted classroom formats (van Diggele et al., 2020), in which study guides, scripts, instructional videos, audio formats, and online campus offerings are used to support competence acquisition before in-person sessions (Table 5). In parallel, teaching activities from research-based learning or internships are employed so that students acquire interprofessional action competence (Table 6). The interviewees focused on capturing individual action logics within case understanding (Oevermann, 2000, as cited in Glässel, 2024, p. 4) in variable action situations (Hartz et al., 2022), thereby deliberately integrating contextual factors into the teaching and learning formats (I5Z273, I14Z211). Case studies or practice-oriented problems are worked on in advance, allowing in-person time to be used primarily for discussion, application, and reflection (I13Z608). The question remains how instructors assess students' preparation levels and to what extent students actually use the provided inverted classroom materials.

Interprofessional teaching and learning formats are oriented towards case understanding, which, owing to multiple contextual factors, excludes purely monoprofessional care (Sottas, 2016). In interprofessional learning, collaborative case understanding supports the coordination of treatment plans and contributes to more effective care (Langberg et al., 2019; Berchtold et al., 2020). Real case situations provide a suitable setting for this, as the competencies to be developed serve as central reference points for content, teaching and learning formats, and assessments (Glässel, 2024). To promote collaboration, instructors use peer-teaching formats (Vogel et al., 2019) and, following Alharbi et al. (2025), employ various methods, such as joint case work (I5Z457, I6Z432, I12Z349), simulated case conferences (I12Z371), and role-playing with simulated patients (I14Z510, I15Z231). In addition, digital formats such as podcasts (I7Z221), virtual labs (I10Z174), or simulation-based conversation bots (I2Z167) are applied and complemented by informal meetings (I3Z556), project marketplaces (I6Z542), open science practices (I15Z235), and external university projects and internships (I10Z273).

6.3 Examination formats in interprofessional education

The assessment of competence acquisition, which is relevant for professional and societal practice (Huber & Reinmann, 2019), can be carried out within the framework of interprofessional education through peer-teaching formats (Vogel et al., 2019) and tasks involving collaborative case understanding (Glässel, 2024). The interviewees implemented assessments for interprofessional education in both written and oral formats (Table 6). Regarding written assessments, the interviewees increasingly relied on external teaching and learning formats, including the documentation of joint research in clinical practice (I15Z162) or research-based learning (I3Z672), scientific surveys (I6Z542), the development of business models (I4Z343), as well as practice- or project-based assignments (Table 7). A point for discussion is the extent to which voluntary participation in interprofessional education formats (e.g., without module credit points) motivates students to complete assessments and thereby complete the constructive alignment process. According to the interviewees, teaching and learning formats for interprofessional education are integrated both resource-efficiently into existing modules (Pitout et al., 2025) and as standalone courses. Overall, the results regarding learning outcomes, teaching methods, and assessment formats support Alharbi et al.'s (2025) conclusion that simulation- and practice-oriented formats, as well as peer-teaching formats (Glässel, 2024; Vogel et al., 2019), offer substantial potential for promoting interprofessional competences.

In the context of interprofessional education, the findings indicate that constructivist teaching and learning formats can be closely aligned with the principle of constructive alignment. The principles of constructivist teaching (Dennick, 2016) are reflected in the teaching and learning formats identified in the results section, such as case-based and simulation-oriented approaches as well as peer-teaching formats (Tables 5 and 6), demonstrating that cooperative learning arrangements and authentic, practice-based tasks can support the process of knowledge construction. Through the deliberate alignment of learning outcomes, teaching methods, and assessment formats in line with Constructive Alignment, students are enabled to apply, reflect on, and further develop this knowledge within interprofessional education, as illustrated by the competence-oriented assessment formats employed (Table 7). Constructivist-informed teaching and learning formats thus promote collaborative, context-related learning and cooperative problem-solving among students from different health professions (Choi et al., 2024) and support the development of interprofessional action competence, as indicated by the findings of this study.

7 Methodological strengths and limitations

Semi-structured interviews provided in-depth insights but are methodologically limited. A total of 16 interviews with faculty members from private universities were conducted, and data saturation was achieved during the data collection process, offering valid insights but not generalisable results. Data collection was conducted digitally via Zoom and covered only a short period, which may have influenced the context. The interview guide may have constrained the openness of responses, while personal affinities, follow-up questions, and nonverbal cues may have affected the course of the conversation and the interpretation of the statements. The reliability and trustworthiness of the qualitative results are described below using the criteria proposed by Lincoln and Guba (1985).

- Credibility was supported through the systematic use of semi-structured interviews, full transcription, and qualitative content analysis following Kuckartz (2016). The combination of deductive categories based on the competence model by Pfäffli (2005) and inductively developed dimensions enabled a theory-driven and data-grounded interpretation. The category system was iteratively reviewed and reflected upon by two additional researchers, thereby enhancing interpretive plausibility.
- Dependability was supported through transparent documentation of all methodological steps – from data collection and transcription to category development – and the consistent application of a rule-based analytical procedure (Kuckartz, 2016). Anonymisation followed a publication-oriented strategy (Reichert, 2015), ensuring traceability of the analytical process while adhering to ethical standards.
- To strengthen confirmability, codes and categories were discussed and reflected upon within the research team. The findings are closely linked to the empirical material and are transparently supported by interview quotations.
- The transferability of the findings is limited because of the qualitative sample of 16 lecturers from private higher education institutions. However, the detailed description of the sample, institutional context, and didactic framework allows for context-sensitive transferability to comparable higher education settings.
- Regarding researcher reflexivity, disciplinary backgrounds, experience in higher education didactics, and preconceptions concerning interprofessional education were continuously reflected upon and discussed within the research team to make their potential influence on data collection and interpretation explicit.

8 Conclusion

The study results demonstrate that interprofessional education is far more than an adjunct to existing teaching and learning formats. It represents a fundamental paradigm shift in higher education, moving away from mere knowledge transmission towards knowledge-in-action, which

deliberately prepares students for complex interprofessional professional fields. Based on the framework of constructive alignment, interprofessional education can effectively contribute to the development of interprofessional action competencies when learning outcomes, teaching formats, and assessments are coherently linked, as outlined. Instructors employ mixed learning groups, case- and project-based approaches, simulations, and inverted classroom models, while external learning sites such as internships additionally promote theory-practice transfer but require substantial resources. Overall, the analysis suggests that the promotion of interprofessional action competencies targets not only subject-specific and methodological dimensions, but also students' personal development and professional identity formation. Consequently, interprofessional education becomes an integral part of higher education that holds societal relevance beyond labour market preparation. Three key implications for higher education didactics emerge, irrespective of institutional type: First, the implementation and curricular integration of interprofessional education should be systematic to ensure consistent competency development. Second, a selection of teaching and learning formats is required that integrates both internal and external offerings while ensuring both controllability and real-world relevance. Third, assessment formats and evaluation methods need to be developed that adequately reflect personal and social dimensions and extend beyond purely cognitive evaluation.

Ethical Considerations

The study was conducted in accordance with established ethical standards for research involving human participants. Within the framework of the project "Factors influencing innovative teaching and learning concepts at private universities [translated from German]", ethical clearance was obtained from the Ethics Committee at the Technical University of Dortmund. Participation in the interviews was entirely voluntary, and all participants received detailed information about the purpose of the study, the methods, and the intended use of the data. Informed consent was obtained from all interviewees prior to data collection. To ensure confidentiality and protect personal data, the interviews were anonymised, and all identifying information was removed from the transcripts. The handling of data complied with relevant data protection regulations, and access to the raw data was limited to the research team. Ethical considerations were continuously monitored throughout the study to ensure the respectful and responsible treatment of participants.

Conflict of Interest

The author declares no conflict of interest.

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