A Competency Level Model for Communication Skills

Kristina Walz* and Edith Braun**

Abstract. This paper examines a communication model based on six theoretical facets. Each facet was operationalised according to two aspects of Habermas' theory of communicative action: strategic and understanding-oriented action. The aim of the empirical analyses was to ascertain whether the postulated model could be used to measure different levels of competence, employing analyses from item-response-theory. We used a sample of 515 students from 11 German higher education institutions. Our empirical study confirmed qualitatively different levels of competence in all six facets. By linking rubrics with quantitative results, we were able to describe each level of competence qualitatively and to relate the different facets to each other. The purpose of this study is to support higher education institutions in the development of concrete strategies for helping students master complex competencies that aid them in their personal and professional development.

Keywords: communication, competence level model, Habermas, higher education, IRT

Assessment of outcomes

Contemporary society is characterized by globalization, and social changes, and by the integration of new forms of technology into workplace and daily life. To be able to successfully navigate these changes within and contribute to society and the workplace, individuals need what are referred to as "21st-century skills". Although the specific set of skills needed varies, depending on the context (Geisinger, 2016; Voogt & Roblin, 2012), these competences have one thing in common. They enable individuals to adapt to different situations. In this article, we thus define "competence" as the ability to adapt one's behaviour and skills according to the relevant context.

Around the world, more students than ever are attending institutions for higher education. This is connected with developments within the institutions and within contemporary society (Altbach et al., 2010; Curaj et al., 2018; Huang, 2017; Shimauchi & Kim, 2020). These institutions of higher education

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not only educate future researchers but also contribute to intellectual and scientific progress, inspire innovation, foster economic growth, and prepare students for the labour market (Coates, 2016; Curaj et al., 2018; Nyssen, 2018). Researchers as well as policy makers share the aim of assisting institutions of higher education in developing strategies for increasing student competences. National and international institutions consider competence as learning outcomes and learning objectives of higher education, and qualifications frameworks are based on this notion (Brabrand & Dahl, 2009; Coates & Richardson, 2012; European Association for Quality Assurance in Higher Education [ENQA], 2015; Kultusministerkonferenz, 2017; Wagenaar & Soeiro, 2018). The need to develop, implement and evaluate these qualification frameworks has led to a marked increase in competence-based higher education and outcome-oriented higher education research (Matsuzuka, 2020; Zlatkin-Troitschanskaia et al., 2016).

Higher education outcomes include at least two types of competences: discipline-specific and generic competences (Strijbos et al., 2015). Specific competences are mainly subject-oriented and refer to knowledge abilities necessary to handle subject-related tasks. They contain terms, theories, models or standard procedures and are integral to carrying out work effectively within the subject field (Allen et al., 2005). Generic competences, by contrast, allow students to apply their knowledge and to master complex, authentic situations in different settings. The ability to act within a situation, as required by 21st century skills, connects both types of competence. Students need core and specialized knowledge of their subject and they need generic competence in order to solve problems. Therefore, we consider students' ability to act in a globalized society as a major and important outcome of competence-based higher education.

When considering different frameworks for 21st century skills in general, and concerning higher education outcomes in particular, we find several skills and outcomes overlap. The competence to communicate successfully in different situations using different means, is not only part of several international 21st century skills frameworks (Voogt & Roblin, 2012), it is also part of international higher education qualification frameworks like the CALOHEE (Wagenaar & Soeiro, 2018) or VALUE initiatives (Rhodes & Finley, 2013). CALOHEE aims at harmonizing European higher education qualification frameworks by offering descriptors of different levels of competences as learning outcomes of higher education. The descriptors differentiate between "knowledge", "skills", and "wider competencies" as distinct categories of competences. Processes of communication and information, they argue, are one of four key dimensions that characterise higher education outcomes. The category "knowledge" describes communication methods and tools. The category "skills" characterises action-oriented behaviour. A "wider competence" can therefore be understood as the ability to identify additional communication strategies that are then adopted in future behaviour (Wagenaar & Soeiro, 2018, p.2). Within the current second project phase, subject-oriented tests are being developed. The assessment approaches of these tests may range from traditional written tests to simulations and are supposed to be accessible via computer applications (Wagenaar, 2021). VALUE, another influencing

project, especially addresses the assessment of learning outcomes. They offer 16 distinct rubrics that contain indicators for performance on different levels. Rubrics and indicators represent core elements of learning outcomes compiled by higher education teachers and experts. The rubric for oral communication is one of the most commonly used rubrics (Rhodes & Finley, 2013). Our study is in keeping with these approaches, since it aims at a theory-driven assessment approach of communication skills in the sense of wider competence and uses a rubrics format for different levels of competence.

Because they are fundamental to preparing students to meet the demands of contemporary society, it is essential to find ways to support, assess, and analyse methods for improving student competences. By extension, it is therefore also necessary to develop suitable methods for teaching, learning, and testing such competences (Coates, 2016). The foundation of such objectives is based on the gathering and analysis of empirical evidence (Coates & Seifert, 2011; ENQA, 2015; Vermunt & Donche, 2017).

In contrast to knowledge, which can be measured and fostered by traditional means, like written exams, action skills must be measured by means that align with their situation-specific character (Braun & Mishra, 2016; Shavelson et al., 2018). Performance-based assessment evaluates action in complex and authentic situations, generating empirical evidence for competences that go beyond mere cognitive processes (Blömeke et al., 2015; Gulikers et al., 2004). Simulations of complex situations like role-plays are one method of performance-based assessment (Braun & Mishra, 2016). They create complex and authentic situations to observe and measure performance and are often used in medical training (e.g. Lane & Rollnick, 2007; O'Hagan et al., 2014). When using role-plays it becomes crucial to distinguish settings in which students play a given role acting in only-student-groups from settings in which students put themselves into a given situation using their own professional action skills in a role-play with a trained partner (Bosse et al., 2012). This setting is a promising method for creating situations that simulate complex and authentic situations, thus allowing observation and assessment of performance abilities. In this study, we investigate a role-play assessment for communicational action skills using trained partners.

In contrast to CALOHEE, which seeks not only to measure but also to compare the outcomes of higher education between different countries, our approach has a different focus. We seek to apply a method that is primarily based on a theoretical framework and assesses individual communicative action skills within a vocational situation. We use different role-plays that refer to workplace related situations of teacher education and economic graduates to test our framework of communicative-action skills and to describe different levels of this competence.

In the future, it may be possible to make use of the theoretical framework presented here to simulate work-related situations related to other subjects and in other countries. For now, the results only apply for those who study teacher education or economics in Germany.

Performance-based assessment of communication

As stated above, we understand communication competence as a fundamental aspect of generic competence expected from graduates. We understand communication as more than a mere exchange of information but as related to action within social situations. This includes the exchange of information but also the organisation and handling of the communicative situation like pursuing and achieving goals, selecting information and a way to share them, or adapting to the situation-specific circumstances.

This concept of communication competence as action ability can be framed theoretically with the theory of communicative action developed by Habermas (1984). Successful handling of the social and situational setting of a communication situation requires action and activates specific performance abilities (Falkenstern et al., 2020). This holistic understanding of communication situations, as a social setting that requires the individual to act, makes Habermas's theory particularly useful for developing a role-play assessment. Braun et al. (2018) combine this theoretical approach with further facets of communication theory to establish: (1) a theoretical framework for understanding a students' communication skills, and (2) a role-play assessment that aims at observing and rating performance ability within communicative settings simulating work-related scenarios. A first empirical validation of the role-play assessment focused on the communication skills of those who study teacher education or economic (Braun, 2021). Graduates of both subjects are likely to face intensive communication situations within their future work environment. Furthermore, both areas combined represent about 45% of German students (HRK, 2020). A significant number of students can therefore be assessed with role-play scenarios from vocational situations related to teaching or economics. If communicative-action skills are viewed from a theoretical perspective, it is possible to transfer the existing role-plays to other subject areas.

The approach of this study builds on the work of Braun (2021), by describing different levels of communication skills and their various facets. Building on the theoretical framework and initial empirical findings we aim to examine and describe assessed levels of communicative-action ability in the sense of wider competencies. This is important insofar as we can only prove developments in competence if a model exists that includes different levels of competence. We can only identify different levels of competence, if we are able to assess if one individual is more competent than another, and, even more importantly, if an increase in competence has taken place over time. Such a model allows us to assess a student's ability to perform in authentic situations in a more holistic way, detached from specific job requirements. In pursuit of this aim, we developed a model based on several theories of communication.

Drawing on Habermas's theory of communication, our study focuses on the micro-level of instruction. It aims to develop a more precise characterization of different levels of competence by broadening the scope of Braun's (2021) analysis.

Understanding-oriented and strategic communication

Habermas describes understanding-oriented action as a communicative act of agreement that does not follow any calculations related to the outcome of a conversation. He sees understanding-oriented action as consent-seeking behaviour between all partners in a conversation. The individuals involved do not engage in communication in order to achieve their individual goals. On the contrary, they base the communication on the condition that they share a commitment to goals and values held in common (Habermas, 1984). Therefore, the aim of communication is for individuals to reach an agreement in the situation instead of on exerting influence on each other. Such settings require competence that entails understandable, true, and honest communicative actions that, of course, fall within the scope of socially acceptable behaviour. We refer to this concept of communicative action as the type of understanding-oriented communication[1].

Habermas characterizes strategic action, by contrast, as the success-oriented coordination of social action. In strategic action, the communication partners are not necessarily focused on achieving common goals. They aim foremost to achieve certain goals as defined by a particular purpose. In addition, they aim to prevent bringing an abrupt end to the conversation. In strategic action, the communication partners hope to elicit a certain reaction from the other participants that goes beyond the situation itself and affects the future relationship (Habermas, 1984; Müller-Jentsch, 2014).

The theoretical framework of Braun et al. (2018) includes a notion of strategic action that diverges from Habermas. Whereas Habermas conceptualizes strategic action in opposition to understanding-oriented action and sees understanding-oriented action as the ideal of social coordination, Braun et al. (2018) conceptualize strategic communication as a form of action in which certain individual goals are to be achieved without a consensus being reached in the end. Strategic action, we posit, is an essential strategy for negotiation and one that is closely intertwined with professional communication, since so much professional activity depends upon it. In order for an organization or for an individual to assert their interests and achieve their goals, they have to engage in negotiation. In our study, we consider strategic action as a part of communicative skills and refer to it as a type of strategic communication.

In both types of communication, we define the goal of a communication based on a non-violent agreement. Empirical results confirm the theoretical dimensions of the two concepts: strategic and understanding-oriented communication (Braun, 2021).

A communicatively competent person chooses between understanding-oriented communication and strategic communication, depending on aim and setting of a conversation. The ability to adapt the type of communication based on different intentions and to act accordingly is regarded as communicative-action skill. We connected both types of communication to further facets of theories of

[1] In the study by Braun (2021), this concept is referred to as communication-oriented-towards-understanding. We consider the concept communication-oriented-towards-understanding and the type of understanding-oriented communication as synonymous.

communication. In general, we define someone as more competent the more that she/he is able to maintain observable and successful action over a variety of situations and interactions. We derive indicators of this observable behaviour from established facets of communication theory. Figure 1 presents a summary of all facets and the derived observable behaviour.

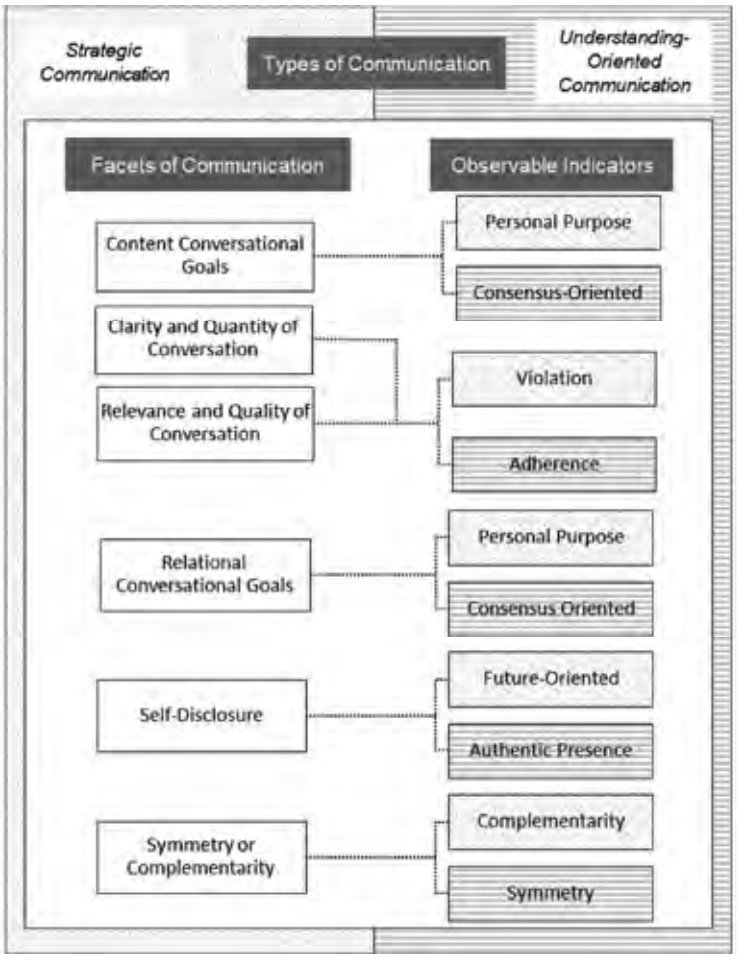

Figure 1. Links between theoretical components and observable indicators

In the following, we introduce these facets and link the observable behaviour to communication competence.

The facets of content and relational goals

Content and relational goals are inherent to all forms of communication (Watzlawick et al., 1967). Content-specific goals refer to the topic of the communication. We consider content goals as either individually purposed or consensus-oriented, with individually purposed goals being achieved with

strategic communication and consensus-oriented goals being achieved understanding-oriented communication. We associate the goals according to the two types of communication (see Figure1).

We consider relational goals as a parameter of successful communication within a socially accepted scope that shapes the relationship between communication partners. Again, we consider these goals as either individually purposed or consensus-oriented and associate them with the two types of communication as explained for the case of content goals.

In most professional situations, the relational level of communication should not be threatened at any time. Even if at the content level, the communication partners have very different opinions, this should not impact the relational level. Someone is more competent when she/he maintains the relational level and reaches the content goal. Someone less competent, by contrast, threatens the relational level but nonetheless may reach the content goal or the other way around. Content and relational level goals are determined by general conversational goals. Both content and relational goals are facets of our conceptual communication model.

Conversational maxims

A further observable indicator of communication are the conversational maxims by Grice (1975). We observe communicative action via the adherence or the violation of maxims of conversation. These include clarity, quality, quantity, and relevance (Frindte, 2001; Grice, 1975). It is hard to draw a theoretical and empirical line between the four maxims, as some are conceptually similar: (1) quantity and clarity and, (2) quality and relevance. If someone's communication adheres to all maxims, a message will contain the exact information needed to be unambiguous (quantity and clarity), as well as being true and relevant to the communication partner (quality and relevance) (Frindte, 2001). We consider these pairs of maxims as two additional facets of our conceptual communication model.

Selecting and presenting information in line with the maxims, creates a cooperative communication situation between the communication partners. We consider this more likely for understanding-oriented communication and associate the adherence of the maxims (as far as it is socially accepted) when selecting and presenting information to the type of understanding-oriented communication (see Figure1).

Communication partners are more likely to violate the maxims connected to strategic communication in order to achieve their content goal. Still, communication partners cannot merely follow nor violate all maxims, they need to evaluate which maxims serve their content goals in which way and then follow or violate such maxims accordingly. We associate the goal-oriented violation of the maxims when selecting and presenting information to strategic communication (see Figure1). Items in the observation sheet follow these rules by rewarding both goal-oriented adherence and goal-oriented violations with a high grade.

The facet of self-disclosure

Self-disclosure describes the process of sharing or forming images of self-concepts between individuals (Hargie, 2010). We understand this in a conversational context not only as verbal statements about oneself but as a process of negotiation and forming of concepts and images about oneself in the mind of the communication partner.

Understanding-oriented communication is connected with a mutual effort of consensus development and requires therefore an authentic and present approach to self-description. In future-oriented strategic communication, the aim is to present a convincing image of oneself, which affects not only the present conversation but also the future opinion of the communication partner. Self-disclosure is one facet of our conceptual communication model (see Figure1).

The facet of symmetry or complementarity

The social positions of communication partners contain by tendency equal positions (e.g. colleagues) and more hierarchical positions (e.g. employee and supervisor). Within vocational settings these positions are often assigned by positions within an institution. The role-play test refers to such vocational settings.

In a communicative setting, the partners can act either symmetric or complementary regarding the differences and similarities of their social position (Goffman, 2008; Watzlawick et al., 1967). A conversation becomes symmetric, when the communication partners are willing and able to somehow adjust the power imbalances that stem from different social positions and to focus on a more equal relation between their positions. We interpret a symmetric communication as focused on achieving a consensus-oriented common goal (see Figure1).

In a complementary conversation, at least one partner uses a more hierarchical social relation between the partners (Watzlawick et al., 1967). We interpret the use of a hierarchical social relation as serving individual goals. Therefore, complementarity is connected to strategic communication (see Figure1).

Research aims

In our study, we empirically analyse different levels of competence within the conceptual facets introduced above. As such, we address the following:

1. We explore the assumed facets and level of competence, thus collecting various qualitative and quantitative information:
    a. We use item response theory to standardize items and distinguish the level of competence qualitatively and quantitatively.

   b. We determine the level of competence assessed with the presented test.
   c. We examine the difficulty of each facet.
2. We use the empirical results to describe the model of competence level in detail.
   a. We combine information derived from each facet with the wording of our study's response scale to form a conceptual competence model.
   b. We combine this conceptual model with quantitative information.
   c. We interpret the theoretical facets based on the empirical results to gain a better understanding of the facets and their assessment.

Methods

Instrument

Braun (2021) employs a performance-based test that uses 10 role-plays to assess communicative skills of higher education students. Five of these role-plays assess strategic communication, five assess understanding-oriented communication. Based on the theoretical framework described above, this test simulates different conditions of vocational fields.

Each role-play contains instructions for the students and communication partners, as well as an observation sheet. The items on the observation sheets for all role-plays combine the described theoretical facets with a situation-specific interpretation of the associated observable indicator. Strategic communication is assessed with 35 items, understanding-oriented communication is assessed with 41 items.

All items of the observation sheet have a four-level response scale, and each point is worded: 1 = "Does not show the behaviour at all"; 2 = "Does not show the behaviour most of the time", 3 = "Shows the behaviour but not every time"; 4 = "Shows the behaviour all the time". These points form the quantitative basis for assessing the student's competence levels according to their different levels of difficulty. We therefore initially refer to them as competence levels. Later, we specify these levels with the empirical findings. On the observation sheets, high values suggest high competence. We trained raters to use the four-point response scale, and to be familiar with the theoretical framework.

Sample

The sample consisted of 515 students from 11 randomly selected German higher education institutions that offered courses in either teacher education or economics or both.

The average age of the sample participant was 23.1 years (sd 3.98). The sample consists of 55% female and 42% male students. The remaining did not associate themselves with either gender or were non-responders. Approximately 46% of the participants were enrolled in an undergraduate program

(mean semester of the program: 3.72, sd 3.67); 23% were enrolled in a postgraduate program (mean semester of the program = 3.46, sd = 3.80); 24% were enrolled in a state-examination program (mean semester of the program = 5.18, sd 3.63). The remaining were enrolled in other programs (eg. "Diplom, Magister"; mean semester of the program = 5.67, sd = 3.27) or did not respond to the question. The average number of semesters in attendance at a higher education institution is 6.41 (sd = 4.83).

Procedure

Each student performed at random four of the ten role-plays, always two strategic and two understanding-oriented. This design is equivalent to a multi-matrix design with different test booklets and leads notionally to 40% data observed and 60% data missing completely at random.

The students started the test with five minutes preparation for the first role-play. They then performed the role-play. After the first performance, they had another five minutes of preparation in order to read the instructions for the second role-play. This procedure was repeated until the students performed all four of the allotted role-plays. The assessment of one student took approximately one hour.

Three people participated in each role-play: the trained observer, the trained confederate, and the student being evaluated. The trained observer filled out the observation sheet after each completed role-play. We used this data for our analysis.

Analysis

One of the aims of our research is to gather qualitative and quantitative information about the assumed facets of communication competence. We therefore analysed the observational data using a method that contains all of the information available and that is simultaneously sensitive to missing data. Item Response Theory (IRT) is an appropriate procedure to analyse competence level. The different models of IRT are a standard method for utilising probabilistic test theory, and an applied method in assessment and evaluation of education outcomes (e.g. Hartig & Höhler, 2009; Nielsen & Dammeyer, 2019; Wilson & Scalise, 2006).

IRT allows descriptions of individual competence as well as estimations of each test items difficulty. Here, values are associated with items and individuals such that every individual has one assigned value and every item has one assigned value. If an item and an individual are both assigned with the same value, then the probability that this individual solves the corresponding item is at least 0.5. Accordingly, both, individual competence and item-difficulty parameter, are mapped on a joint scale, called theta-scale (θ) (Embretson & Reise, 2013; Hartig & Frey, 2013; Raykov & Marcoulides, 2018).

The value assigned to an individual is based on the pattern of correct and incorrect answers in the test (Embretson & Reise, 2013). The test assesses the competence of this individual as compared to the sample. An individual competence value of $\theta = 0$ is interpreted as mean competence.

Another benefit of IRT-models is that they allow analysis of incomplete data, as long as the data is missing completely at random (Hartig & Frey, 2013). This feature is especially beneficial for tests with a multi-matrix design (Hartig & Frey, 2013), as is the case with our study. For the analysis of polytomous test items there are different polytomous IRT-models that allow for a graduated assessment of answers (Ostini & Nering, 2006). The joint theta-scale standardizes unequal spaces between the observed grades of one item and allows further interpretation (Boone, 2016; Embretson & Reise, 2013). We modelled our data with the graded response model (GRM), which is an indirect polytomous IRT-model (Embretson & Reise, 2013; Samejima, 2010). This model is appropriate for use in case of an ordered categorical response (Embretson & Reise, 2013; Raykov & Marcoulides, 2018). We compared this model with other polytomous models using the Aikake information criterion (AIC) and Bayesian information criterion (BIC) values (see Table 1). Both are common indices for the fit between analysis models and observed data. The model associated with the smallest values within a comparison is considered to be preferred (Raykov & Marcoulides, 2018). Compared to other polytomous models, the GRM showed the smallest AIC- and BIC-values within our data (AIC: 14597.24 (strategic); 17517.95 (understanding-oriented); BIC: 15183.2 (strategic); 18213.99 (understanding-oriented). Therefore, we used GRM in this study.

Table 1. AIC and BIC Comparison of Three Models

Model	Strategic Communication		Understanding-Oriented Communication	
	AIC	BIC	AIC	BIC
PCM	14881.08	15322.67	17688.23	18214.5
GPCM	14632.97	15218.93	17537.24	18233.28
GRM	14597.24	15183.2	17517.95	18213.99

Note: AIC – Aikake information criterion; BIC – Bayesian information criterion; PCM – partial credit model; GPCM – generalized partial credit model; GRM – graded response model.

Single items contribute a certain extent of information to the analysis. However, in order to determine the overall range of competence that we assessed using the test, we also needed to observe the test as a whole (Baker, 2001). We thus applied a specific post-estimation function of the GRM: the Test Information Function (TIF). This function describes the power of the total test to differentiate two individuals with similar but not identical competence throughout the theta-scale. A test can differentiate best between two individuals for intervals with a high TIF-value (Baker, 2001; Raykov & Marcoulides, 2018). We used these intervals to determine a valid range of competence for our test and further analysis and interpretation.

We explored item difficulty, and severity of competence facets, by applying another graphical post-estimation function of the GRM: the Category Characteristic Curve (CCC). The CCC determines intervals of the competence-scale theta in which each of the four points of our response scale is more likely to appear than the other three. The estimation of these intervals is based on the item-difficulty parameters. The GRM estimates one difficulty-parameter per threshold between categories or points of

response scale (Raykov & Marcoulides, 2018). For a better understanding of the distribution of intervals and thresholds, we transferred the CCC results to an adaption of a Wright Map. This is a visualisation of the distribution of item difficulties, introduced originally to arrange items after a Rasch analysis (Boone, 2016). Our adaption maps each item and depicts up to three observed thresholds between different levels, instead of only one difficulty parameter. We plotted one Wright Map for each type of communication, organized according to the theoretical facets. As a result, we were able to summarize the items of each facet and therefore associate the severity of each facet by interpreting the position and width of the competence intervals.

The second aim of our research is to combine the quantitative information of the GRM, CCC, Wright Map, and TIF with the qualitative description of the assumed theoretical facets into a competence level model. We started by developing conceptual competence frames for both types of communication. They each contain four rubrics per theoretical facet presented in the introduction. Each rubric combines information of one facet with the wording of one response scale point. This resulted in a first specification of observable behaviour on different competence levels.

We then computed for each facet the mean interval of each of the four response scale points as mapped by CCC and Wright Map, and arranged the conceptual rubrics along the empirical intervals. Furthermore, we supplemented the conceptual rubrics with item-level information of the Wright Map, by including wordings of qualitatively distinct items in the rubric.

Finally, we used the derived models of competence to describe the theoretically-assumed facets with the empirical results. This led to a model of different level of competences. This model supports the understanding and interpretation of the assessment.

Results

To achieve our aim of gathering empirical information about the facets of communication skills, the first step estimates a GRM for each type of communication using the observations of the role-plays. The estimation resulted in three difficulty parameters per item for most items. For two items of strategic communication, we observed only two difficulty parameters each. Furthermore, we derived graphical depictions of these parameters (CCC) and a TIF, describing each type of communication as a whole. We observed different difficulty parameters and intervals for different categories and items. This means that the items show different levels of competence. In addition, the interpretation of the amount of difficulty parameters allowed a first assessment of the underlying level of competences: We did not include item categories (levels) without an estimated difficulty parameter in the additional analysis. This resulted in a three-level-structure for some facets, as will later be shown.

In a second step, we set the overall interval of competence on the theta-scale assessed with our test from the results of the TIF. We present the results for both types of communication in Figure 2.

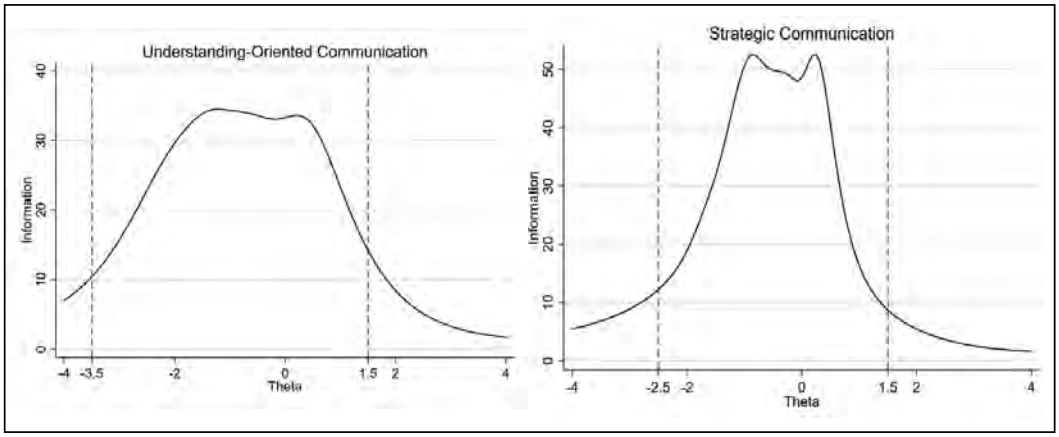

Figure 2. Test information functions

We observed high values of test information (TIF) for competence of understanding-oriented communication ranging from θ=-3.5 to θ=1.5. Regarding strategic communication, the interval of competence ranges from θ=-2.5 to θ=1.5. These results determine the valid intervals of competence for our test, forming the basis for additional interpretation.

We conclude that, on the whole, the model is a good tool for measuring communication competence-level, especially in regards to lower areas and around a mean competence value. This could include participants in early stages of their studies.

In a third step, we transferred the response point intervals of each item to a Wright Map as level of competences. The Wright Map covers only the valid competence intervals derived above.

We observed a variety of intervals and thresholds. Regarding the item-level of understanding-oriented communication, the smallest interval covers 0.2 units (response point 2 of two items associated with self-disclosure), the largest interval covers 3.35 units (response point 2 of an item associated with self-disclosure) of the theta-scale. Overall, each interval covers a mean of 1.31 units (sd 0.54) of the theta-scale. Regarding the item-level of strategic communication, the smallest interval covers 0.2 units (response point 3 interval of an item associated with self-disclosure), the largest interval covers 3.85 units (response point 3 interval of an item associated with relational goals) of the theta-scale. For the most part, each interval covers a mean of 1.22 units (sd 0.75) of the theta-scale. These values determined the quantitative limits and extents of the different levels of competence, which in turn were determined by the four response points contained in the observation sheets.

Table 2 provides the mean interval-widths and thresholds for each facet. We set the boundaries of the derived valid competence interval as lower thresholds of the lowest assessed level and as upper thresholds of the highest assessed level.

Table 2. Mean competence intervals and threshold per facet and type of communication

		Understanding-Oriented Communication			Strategic Communication		
Facet	**RP**	θ_l	$\lvert\theta_l-\theta_u\rvert$	θ_u	θ_l	$\lvert\theta_l-\theta_u\rvert$	θ_u
CG	*1*	-3.5	1.5	-2	-2.5	1.25	-1.25
	2	-2	0.96	-1.04	-1.25	0.83	-0.42
	3	-1.04	1.31	0.27	-0.42	0.55	0.13
	4	0.27	1.23	1.5	0.13	1.37	1.5
RG	*1*	-3.5	1.17	-2.33	-2.5	0.7	-1.8
	2	-2.33	1.35	-0.98	-1.8	1.88	0.08
	3	-0.98	1.43	0.45	-1.92	2	0.08
	4	0.45	1.05	1.5	0.08	1.42	1.5
CQ	*1*	-3.5	1.25	-2.25	-2.5	0.33	-2.17
	2	-2.25	1.22	-1.03	-2.17	1.47	-0.7
	3	-1.03	1.43	0.4	-0.7	0.8	0.1
	4	0.4	1.1	1.5	0.1	1.4	1.5
RQ	*1*	-3.5	1.15	-2.35	-2.5	1.06	-1.44
	2	-2.35	1.05	-1.3	-1.44	0.98	-0.46
	3	-1.3	1.54	0.24	-0.46	0.74	0.28
	4	0.24	1.26	1.5	0.28	1.22	1.5
SD	*1*	-3.5	1.98	1.52	-2.5	0.57	-1.93
	2	1.52	0.89	-0.63	-1.93	0.6	-1.33
	3	-0.63	1.17	0.54	-1.33	1.42	0.09
	4	0.54	0.96	1.5	0.09	1.41	1.5
SC	*1*	-	-	-	-2.5	1.19	-1.31
	2	-3.5	1.05	-2.45	-1.31	1.33	0.02
	3	-2.45	2.7	0.25	-1.46	1.48	0.02
	4	0.25	1.25	1.5	0.02	1.48	1.5

Note: RP – response point; θ_l – lower threshold; θ_u – upper threshold; CG – content goals; RG – relational goals; CQ – clarity and quantity of a conversation; RQ – relevance and quality of a conversation; SD – self-disclosure; SC – symmetry or complementerity of a conversation

We found three cases without the assumed 4-level-structure that we had used in the observation sheet. The first is the facet of symmetry or complementarity for understanding-oriented communication, where we observed the threshold between level-1 and level-2 skills at θ=-5.4, which is outside the valid interval of competence (see TIF results above). Therefore, the test only captures competence starting with level 2 of symmetry or complementarity. As there is only one item measuring this facet, the integration of further items might improve the test's ability to differentiate between individuals with level-1 and level-2 skills related to this facet. The other two facets with a 3-level-structure are the facet of relational goals, and of symmetry or complementarity within strategic communication. Here, we found the intervals of level 2 and 3 overlapping. They converge to a single competence level, where we expect a mixture of the former rubrics. In both types of communication, symmetry or complementarity are the least accurately measurable facets. In general, distinct intervals of different level of competences are supported empirically.

Next, we outlined a model of competence level with conceptual rubrics for both types of communication. Each rubric is a combination of one facet and a wording of one response scale-point. This resulted in a first specification of observable behaviour on different competence levels. Figure 3 provides an example of this conceptual competence frame, based only on theoretical facets and the response wordings, or respective level of competences.

Figure 3. General strategic communication competence rubrics (exemplary representation)

Strategic communication	CG	RG	CQ	…
Level 4 *Shows the behaviour all the time.*	The student achieves factual conversation goals.	The student achieves interpersonal conversation goals.	The student expresses her-/himself clearly.	…
Level 3 *Shows the behaviour but not every time.*	The student achieves most factual conversation goals.	The student achieves most interpersonal conversation goals.	The student expresses her-/himself clearly most of the time.	…
Level 2 *Does not show the behaviour most of the time.*	The student achieves some factual conversation goals.	The student achieves some interpersonal conversation goals.	The student expresses her-/himself clearly at some points in a conversation.	…
Level 1 *Does not show the behaviour at all.*	The student does not achieve factual conversation goals.	The student does not achieve interpersonal conversation goals.	The student does not express her-/himself clearly.	…

Note: CG – content goals; RG – relational goals; CQ – clarity and quantity of a conversation

We continued the development of a competence level model by supplementing the theoretically derived rubrics with the information gathered in GRM, TIF, CCC, and Wright Map.

First, we assigned the conceptual rubrics to the valid competence intervals based on the empirical mean competence intervals and thresholds. Second, we used quantitatively distinct items to supplement the basic rubrics of each level. This procedure resulted in two competence level models (Figure 4 and Figure 5), allowing the development of in-depth rubrics that describe the expected communicative skills of an individual assessed with a certain competence value.

We observed different thresholds between two levels for different facets. For example, a student could be assessed with an overall strategic communication competence value of $\theta = -1.5$. This value assesses Level 1 of competence regarding the abilities to achieve content goals, to focus strategically on relevant information and power imbalances, while assessing Level 2 of competence regarding the achievement of relational goals, the strategic use of the clarity and quantity maxims, and self-disclosure. These empirical models allow a wide variety of possible skill descriptions and highlight different competence requirements for different facets and for both types of communication.

Figure 4. Competence level rubrics; Understanding-oriented communication

θ	CG	RG	CQ	RQ	SD	SC
1.5						
1	***Level 4*** The student achieves factual conversation goals.	***Level 4*** The student communicates openly and acts supportive.	***Level 4*** The student expresses her/his aim clearly and different ideas and situations openly.	***Level 4*** The student's ability to provide relevant information stabilizes. She/he differentiates between necessary information and communicates this openly and provides reassurance that she/he has understood the communication partner.	***Level 4*** The student acts authentically throughout the conversation. Still, it might be difficult in some cases to respond to the communication partner's worries in an appropriate/ authentic way.	***Level 4*** The student consistently communicates in an approachable manner.
0.5						
0	***Level 3*** The student achieves moderate factual conversation goals, especially goals linked to a symmetric conversation.	***Level 3*** The student communicates openly and acts supportive most of the time.	***Level 3*** The student improves the clarity of her/his communication. Especially when in a stronger social position, she/he communicates clearly.	***Level 3*** The student gives only relevant information in most cases but still struggles when she/he needs to provide reassurance that she/he has understood the communication partner.	***Level 3*** The authentic behaviour in a conversation stabilizes and the student expresses personal opinions in an understanding-oriented way.	***Level 3*** The student communicates in an approachable manner most of the time.
-0.5						
-1	***Level 2*** The student achieves easy, factual conversation goals.	***Level 2*** The student communicates openly and acts supportive sometimes.	***Level 2*** The student struggles still with the challenge to communicate clearly and openly throughout all types of conversation. She/he communicates different ideas clearly (irrespective of anyone involved in the conversation).	***Level 2*** The student struggles with the challenge to give relevant information, especially when she/he needs to provide reassurance that she/he has understood the communication partner.	***Level 2*** In general, the student acts authentically and often responsive to the partner's arguments and feelings.	
-1.5						
-2					***Level 1*** The student does not show full authentic self-disclosure, but she/he might establish trust and authentically respect the partner's arguments sometimes.	
-2.5	***Level 1*** The student does not achieve factual conversation goals. Exceptions are goals linked to a symmetric and understanding-oriented conversation, which are achieved sometimes.	***Level 1*** The student does not communicate openly nor act supportive.	***Level 1*** In general, the student does not communicate her/his case clearly. An exception is the communication of several different ideas in a conversation in which the communication partners share equal social positions.	***Level 1*** In general, she/he does not give relevant information. But she/he focusses on the reason for the conversation, especially when in a setting in which the partners are socially equal.		***Level 2*** The student communicates in an approachable manner sometimes.
-3						
-3.5						
θ	CG	RG	CQ	RQ	SD	SC

Note: θ – competence value theta; CG – content goals; RG – relational goals; CQ – clarity and quantity of a conversation; RQ – relevance and quality of a conversation; SD – self-disclosure; SC – symmetry or complementarity of a conversation

Figure 5. Competence level rubrics; Strategic communication

θ	CG	RG	CQ	RQ	SD	SC
1.5						
1	***Level 4*** The student achieves factual conversation goals and persuades the communication partner to accept her/his goal.	***Level 4*** The student establishes a positive relationship, if it is for strategic use in the future.	***Level 4*** The student expresses her/his cause clearly and supports her/his own arguments by promising information.	***Level 4*** The student expresses her/his cause precisely and with strategically necessary information. She/he differentiates between situations requiring more detailed and more general information.	***Level 4*** The student presents her/himself in a future-oriented way. She/he supports an assertive and positive self-disclosure. During ambivalent situations, however, the student occasionally struggles to maintain a positive engagement, which affects self-disclosure.	***Level 4*** The student makes strategic use of power imbalances but ensures a symmetric conversation, depending on the situation.
0.5				***Level 3*** The student expresses her/his cause with mostly strategic-oriented information. There is little restriction of the communication partner's strategically non-convenient arguments.		
0	***Level 3*** The student achieves most factual conversation goals against other opinions.		***Level 3*** The student ex-presses her/his goal clearly for most of the conversation but might have difficulty presenting only the information that will help achieve her/his aims.		***Level 3*** The student presents her-/himself in an assertive and committed way. Still, in socially ambivalent situations it is more difficult to maintain this style of positive self-disclosure.	***Level 2/3*** The student makes strategic use of power imbalances and ensures a symmetric conversation as long as the communication partner goes along.
-0.5	***Level 2*** The student achieves factual conversation goals using a convincing strategy against the conversation partners's resistance.	***Level 2/3*** The student establishes a positive relationship, if it is for strategic use in the future. The student has some difficulties in ambivalent situations.		Level 2 The student limits most of her/his own conversation input to the strategically relevant but is unable to restrict the communication partner's input.		
-1			***Level 2*** The student expresses future oriented issues in a success-oriented way as long as she/he is in a stronger position.		***Level 2*** The student presents her-/himself in an open and friendly but noncommittal way as long as the situation is not ambivalent.	
-1.5						***Level 1*** In general, the student does not make strategic use of power imbalances nor shapes a conversation in a symmetric way. But she/he appears in a manner that is, on the whole, approachable.
-2	***Level 1*** The student achieves easy, factual conversation goals as long as there is no resistance.	***Level 1*** The student does not establish a positive relationship, for strategic use in the future. In general, she/he communicates in a friendly manner.	***Level 1*** The student does not communicate her/his cause in a success-oriented way.	***Level 1*** The student does not focus on strategically relevant information.	***Level 1*** In general, the student does not present a future-oriented self-disclosure. She/he presents her-/himself in an authentic but not strategic manner.	
-2.5						
θ	CG	RG	CQ	RQ	SD	SC

Note: θ – competence value theta; CG – content goals; RG – relational goals; CQ – clarity and quantity of a conversation; RQ – relevance and quality of a conversation; SD – self-disclosure; SC – symmetry or complementarity of a conversation

In the next sections, we describe the qualitative implications of the quantitative results for each facet.

The facets of content and relational goals

Understanding-oriented communication

The achievement of content goals in an understanding-oriented communication seems to be easier in a symmetric balance. The focus of the relational goals is the development of an open and supportive atmosphere. An individual should act in an open but not hurtful manner in order to achieve understanding. This facet of competence can be sufficiently described by the four observed levels.

Strategic communication

We found four different competence levels for strategic content goals. The students were more likely to achieve these content goals at higher levels of competence. Diverging opinions in a conversation posed an obstacle for the lower two competence levels but not for the higher competence levels. Concerning relational goals, we found only three different competence levels, where formerly-assumed levels 2 and 3 converge into one middle level. Here, the ambiguity of a situation seems to have posed an obstacle for a lower competence level. At a higher competence level, the students were more likely to achieve future-oriented relational goals even in ambivalent situations.

The facets of clarity and quantity, and relevance and quality

Understanding-oriented communication

Regarding the facet of clarity and quantity, it appears to have been challenging to communicate clearly without threatening the relationship or situation. We observed that hierarchical social positions impacted communication; students in a more powerful position were more likely to communicate clearly. The same holds for the quality of the conversation: students in a more powerful position were more likely to receive affirmation for their opinions as well as give affirmation for the conversation partner's ideas.

Strategic communication

For a strategic use of the facet of clarity and quantity, the students needed to choose the amount of information to disclose clearly, based on a future-oriented goal. We observed four levels of competence for both facets. Hierarchical social positions, again, appeared to have impacted the student's strategic use of clarity and quantity. We only expect students with an assessed competence level 4 to successfully use the maxims, regardless of their social position. Successful use of the facet of relevance and quality made it possible for the student to consciously present false information or to conceal accurate information. With a higher competence level, the students were more likely to choose a successful combination of clear communication and the right amount of information to share.

The facet of self-disclosure

Understanding-oriented communication

The most difficult part of an authentic self-disclosure appears to respond appropriately to the partner's worries and concerns. A student's ability to communicate in an authentic and understanding-oriented way seems to have stabilized with each of the four levels, contingent upon the student's ability to establish trust and an understanding-oriented atmosphere.

Strategic communication

The test assesses future self-disclosure as either assertive or favourable or a combination thereof. In each of the four levels, we observed that socially ambivalent situations posed an obstacle to communication. The facet self-disclosure for strategic communication contained more items than any other facet.

The facet of symmetry or complementarity of a conversation

Understanding-oriented communication

The test measured symmetry or complementarity in an understanding-oriented communication only with one item that aimed at not showing complementary behaviours. We therefore interpreted the results of this item with caution. This item only allowed for an interpretation of three levels for the defined area of competence. We observed a growing competence in symmetric behaviour by students who acted in an approachable manner.

Strategic communication

The facet of symmetry or complementarity of a conversation for strategic communication captured a student's ability to make strategic use of her/his social position for three different levels. This skill stabilized more with each successive level.

Discussion

The aim of this paper was twofold: Firstly, we presented a model with theoretical facets and different levels of competence for communication skills. Secondly, we explored the competence levels by gathering empirical data related to the theoretical facets that we have identified. As the basis for a model with which to measure communication competence, the results of our study thus make a theoretical and empirical contribution to research on higher education outcomes. We observed that the examined facets can be used as rubrics of different levels of communication competence. Based on the results of IRT analysis, CCC, TIF, and Wright Map application, we derived intervals of competence assessed with the role-play test for both types of communication. These allowed a valid assessment of competence for

lower-to-middle areas of competence. Moreover, we were able to confirm different levels of competence in six theoretical facets, even if sometimes only three of the assumed four levels of competence appeared in the facets. In addition, by linking the content descriptions to the quantitative results, we were able to describe each level of competence qualitatively and then relate the different facets to each other. The result is a performative test that cannot only provide a detailed set of rubrics of an individual's communicative-action skills but can also assess them. The model also allows for a theoretical description of concrete communicative behaviours that vary in terms of their level of difficulty. We know, for example, that it is more difficult to conduct a symmetrical conversation than to make the relationship level positive.

The established model therefore allows a complex, theoretically driven but nonetheless standardized assessment of competence. With this model, we seek to make learning outcomes more measurable, in the sense of being able to measure changes (improvements as well as declines) in a student's communication competencies over time. To measure such changes, however, we need first to be able to ascertain empirically a student's competency level. Such a model is now available.

This model also helps to fill an additional gap in the literature, not merely in terms of knowledge but also in terms of examining generic capacities for action as related to learning outcomes in higher education. The test's performative aspect makes it possible to simulate and make visible an individual's complex capacities for action; specifically, it assesses a student's key capacities for action.

Empirically, it is particularly difficult to capture complex capacities for action in their entirety. We therefore view our approach as a means by which theoretically complex capacities can be operationalised as holistically as possible (Falkenstern et al., 2020). We hope to contribute to the field by employing a method that involves a cross-fertilization of theoretical and empirical focal points and that closely integrates concepts related to communication and competence in higher education.

This study nonetheless has limitations. First, for now the role-plays are only applicable to the German context of those who study teacher education or economics. We are optimistic that the scenarios of the role-plays can be adjusted to suit different settings, including different subjects of study and/or national or cultural contexts, while still maintaining the underlying theoretical framework.

Second, we operationalised the theoretical facets with different numbers of items. The facets with very few items were therefore likely to be less accurate, since they depend to a great extent on the evaluations in the observation forms.

Third, these measurements of behaviour were themselves mediated, since they were conducted by observers. To account for this, we randomly assigned observers, so that a general evaluation of the model, as we have conducted in this study, was unlikely to influence the outcome. This does not mean, however, that observers did not impact the diagnosis of the students involved in the study. To account for this issue, it would therefore be expedient for future research to investigate how observers influence such studies systematically.

Fourth, the test has not yet been conducted longitudinally. We cannot therefore say whether or not

students improve their communication skills over the course of their higher education. Such longitudinal studies are still to be done.

The results of this study can also support improvements in teaching. While we examined the role-plays as tools for measurement, they could also, along with their accompanying theoretical aspects, be integrated into teaching, as part of teacher training, for instance. If it is implemented into a higher education institution's curriculum, it can be used for formative assessment and support students in their learning process. Our study as well as other new forms of assessment therefore has the potential to contribute to further development in higher education insofar as it actively and performatively promotes action competencies via developing better pedagogical methodologies and practices. These new approaches to assessment will promote further implementation of generic skills as well as development of institutional curricula (Panadero & Jonsson, 2013).

On the macro-level, however, we also hope to spark a discourse on issues related to the quality of higher education that students receive. When it comes to quality, it goes without saying that institutions of higher education prepare their students with a command of complex competencies. Such a command includes discipline-specific knowledge and skills. Institutions of higher education play an important part in developing a student's competencies. A mastery of such competencies is more crucial than ever. To meet the demands of the labour market and of our globalised society, graduates of higher education need to be able to navigate socially challenging situations. Our model aims to do just this, to help institutions of higher education develop concrete strategies for helping students master such complex competencies that they need to thrive personally and professionally.

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