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# Awareness of Heterogeneity: Empirical Findings on How Prospective Schoolteachers Perceive Heterogeneity in the Classroom

## *Heterogenitätssensibilität: Empirische Befunde zur Wahrnehmung von Heterogenität in der Schulklasse durch angehende Lehrkräfte*

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### **Abstract (English)**

*Two scientific disciplines, Cultural Science and the research stream on Inclusion in Schools and Education, have experienced a similar change of paradigm, when they both let go of their dominant criterion to distinguish between groups and widened their view to an endless variety of so-called dimensions of heterogeneity. In this context, the construct “Awareness of Heterogeneity” has been designed. It describes, how (prospective) schoolteachers perceive heterogeneity among their pupils. Respective empirical findings show, which dimensions of heterogeneity they expect to find at school, which ones they detect in a concrete setting, and how they rank and evaluate them. This leads to the question, whether their consideration of heterogeneous classrooms as an enrichment and/or challenge varies with the kind of dimensions of heterogeneity they have in mind.*

*Keywords: Heterogeneity, Awareness of Heterogeneity, Dimensions of Heterogeneity, Inclusive Education, Empirical Findings*

### **Abstract (Deutsch)**

*Zwei wissenschaftliche Disziplinen, die Kulturwissenschaft und der Forschungszweig zu Inklusion in Schule und Bildung, haben einen ähnlichen Paradigmenwechsel erlebt. Beide haben sich von ihrem vorherrschenden Kriterium zur Unterscheidung menschlicher Gruppierungen verabschiedet und ihren Blick auf eine endlose Vielfalt sogenannter Heterogenitätsdimensionen geweitet. In diesem Zusammenhang wurde das Konstrukt „Heterogenitätssensibilität“ entwickelt. Es erfasst, wie (angehende) Lehrkräfte Heterogenität unter ihren Schüler\*innen wahrnehmen. Entsprechende empirische Befunde zeigen, welche Heterogenitätsdimensionen sie in der Schule erwarten aufzufinden, welche sie in einem konkreten Setting erkennen und wie sie sie gewichten und bewerten. Das führt zu der Frage, ob ihre Einschätzung von Heterogenität im Unterricht als Bereicherung und/oder Herausforderung mit der Art von Heterogenitätsdimensionen variiert, die sie sich vorstellen.*

*Schlagwörter: Heterogenität, Heterogenitätssensibilität, Heterogenitätsdimensionen, schulische Inklusion, empirische Befunde*

## 1. Introduction

Two scientific disciplines have both dethroned their kings.

Cultural Science has let go of nationality as their only cultural borderline (e.g., Baskerville 2003, Behrens 2007, McSweeney 2002a and 2002b), and the research stream on Inclusion in School and Education has widened its view beyond the category of special educational needs which used to be considered the most important criterion of distinction in the classroom (Hinz 2009:172). Both concepts are still undisputedly relevant to theoretical as well as empirical research in their fields. They are just not considered exclusively relevant anymore, instead they are set into context among others.

To trace it back in more detail: While Cultural Science has overcome the paradigm (Haas 2009), that human minds are determined by one coherent set of values homogeneously shared by their national or ethnic entity (Schmitz 2015:26-45), Inclusive Education has reviewed the so-called narrow understanding of inclusion, which focuses on teaching classes of pupils with and without special educational needs (e.g. Fischer et al. 2014:1). In both cases, researchers have reviewed the status of one prominent category that once served to form groups, distinguish between them (Hofstede et al. 2010:336), and to name those groups that were considered relevant to research (Hofstede 2002:2) and training (Hofstede / Hofstede 2005:xi). In the words of Cultural Science, the exclusive relevance of one constitutive criterium of collectives (Hansen 2009:27) needed to be reviewed. Speaking in terms of Inclusive Education, the exclusive relevance of one dimension of heterogeneity had been over-estimated.

Thus, alternative drafts were presented. For instance, “Multicollectivity”, one key term of modern Cultural Science (Rathje 2014:39), states that an individual is a member of and therefore in-

fluenced by an uncountable number of collectives (Hansen 2009:20). This idea is shared by the idea “Intersectionality” (Winker / Degele 2009, Walgenbach / Pfahl 2017). Related to this, the concept of “Polycollectivity” describes how this uncountable number of collectives exists in cohesion (Hansen 2017:13). In the field of Inclusive Education – the following focuses on Inclusive School Education – a now “wide” respectively “reflexive” understanding of inclusion (e.g. Budde / Hummrich 2013, 2015) refers to an explicitly great variety of dimensions of heterogeneity that can be of impact for teaching and learning. The reformulated mission for schools and teachers is called “teaching of heterogeneous groups” (Prengel / Heinzl 2012), and the prominent approach of “adaptive teaching (competence)” aims<sup>1</sup> at taking many characteristics of pupils and their backgrounds into account, when designing and conducting lessons, tasks, feedback, and classroom management (Beck 2008, Brühwiler 2014).

The approaches of both disciplines have in common that, when they speak of heterogeneity, they (now, after it had been argued for a long time already) underline a theoretically indefinite number of existing collectives, respectively dimensions of heterogeneity (Hansen 2009:22 and 27; Lang et al. 2010:316). They also stress, that regarding one individual (pupil), the belongings to several collectives, respectively a variety of dimensions of heterogeneity, are to be taken into account. Both disciplines state that, in a concrete situation or under a specific focus, the belonging to certain collectives, respectively certain dimensions of heterogeneity, can become (in)directly virulent (Rathje 2014:42 seq.; Emmerich / Hormel 2013:151). Overall, they remind us to keep a close eye on heterogeneity, in the classroom, respectively in any other group in question.

When (prospective) teachers are asked to keep a close eye on heterogeneity in their classroom, how do they actually

perceive differences among their pupils? This article takes a closer look at this question by applying a new construct. First, it follows up on the discussion of heterogeneity in the context of school and education (chap. 2). Then, it presents the construct “Awareness of Heterogeneity” (chap. 3), which basically describes a differentiated and reflected perception and recognition of heterogeneity of a specific group of pupils in a concrete situation by the teacher. This construct has been empirically operationalized and applied in a few studies among students at Humboldt-Universität zu Berlin (chap. 4). The findings detect, which dimensions of heterogeneity these prospective teachers expect in a regular class (chap. 4.1), which dimensions they perceive in a concrete setting (chap. 4.2), and which of these they find most relevant (chap. 4.3). Furthermore, they show, if prospective teachers consider the teaching of heterogeneous groups as an enrichment and/or as a challenge (chap. 4.4) and they differentiate, if these considerations vary with the kind of dimensions the respondents were thinking of (chap. 4.5). The findings give insight in what prospective schoolteachers have in mind, when they speak of heterogeneity among pupils, and overall, so will be concluded, they show that Cultural Science and Inclusive Education are on similar paths here.

## **2. The Concept of Heterogeneity and its Meaning for School**

Dealing with heterogeneity has become an integral part of German-language educational science by the 1990s at the latest (Walgenbach 2014:7). The way was paved by several impulses: First, there was an empirical turn in educational science, meaning an increasing application of social science methodology and research questions in educational science (e.g. on social structures and their impact on educational success). Moreover, emancipatory movements by women and disabled people in the

1960s and 1970s, as well as the ideas of early integration pedagogy, and finally the approach of international comparative studies in the 1990s had an impact on the design of educational research on heterogeneity issues.

As a consequence, the concept of heterogeneity has been the object of numerous empirical studies (e.g. Rauin 1987; Preuss-Lausitz 2001; Reh, 2005; Lang et al. 2010; Kemena / Miller, 2011; Scharenberg 2012, 2013; Gebauer et al. 2013). The respective research questions have been focusing on a general understanding of heterogeneity, attitudes towards heterogeneity (especially with regard to opportunities versus challenges), condition factors of school performance and individual support, related professional challenges, questions of the ‘feasibility’ of teaching heterogeneous learning groups and the deconstruction of the so-called Myth of the Advantage of Heterogeneous Learning Groups.

In these discourses, heterogeneity is understood as “differences between two properties, persons or artifacts with regard to a criterion” (Budde 2013:8; transl. by authors). It is considered a relative, multidimensional, social construct. For school and teaching, this means that a learning group is always as heterogeneous, “as heterogeneity is ‘seen’ and ‘negotiated’ in didactically structured situations” (Seitz 2008:193; transl. by authors). An appreciative, reflective approach to heterogeneity in school and teaching is generally considered to be central to modern pedagogy. It is understood as a contribution to non-discrimination in schools and as the basis for educational success. The individual support of students or the individualization of lessons have long been described as the essential strategies for dealing with heterogeneity (cf. Breidenstein 2014).

### 3. Awareness of Heterogeneity: An Operationalization of Construct

“Awareness of Heterogeneity” is a translation from the original German term “Heterogenitätssensibilität” (Schmitz / Simon 2020). Here, “Awareness” (“Sensibilität”) is based on the susceptibility for stimuli (Fröhlich 2014:436) and aims at specifying the grade of sophistication, by which individuals perceive themselves and their surroundings (Fuchs-Heinritz 1995:597). “Heterogeneity” (“Heterogenität”), so has been shown above, describes differences between groups regarding a certain criterion (Budde 2013:8). These criteria have been referred to as dimensions. Heterogeneity is not an objectively visible and stable fact; it much rather is to be considered a dynamic construct seen from a subjective perspective.

Both scientific disciplines, Cultural Science such as Inclusive Education Research, present constructs that at first sight seem to be similar, but then do not prove equivalent. For instance, in Cultural Science, the “Teacher Cultural Beliefs Scale” (Hachfeld 2013) and the work on „Personal and Professional Beliefs of Teachers about Diversity“ (Pohan / Aguilar 2001) do sound related, but they both implement the traditional focus on nationality. And in the context of Inclusive Education, the concept of “Competence for Heterogeneity” (“Heterogenitätskompetenz”) (Spiegel / Walter 2005; transl. by authors) does address the same phenomenon, but refers to a level of action, not perception. Moreover, the concept “Awareness of Diversity” (“Diversitätssensibilität”, transl. by authors) (Fereidooni 2020) was developed in the context of anti-racism research. It rejects the use of the term “ethnic” and contains a strong normative component, recommending teachers how to deal with diversity in the classroom. Nonetheless, there are conceptual overlaps between Awareness of Heterogeneity and other constructs (Schmitz/

Simon 2018). Just like the construct “Awareness of Habitus” (“Habitusensibilität”) (Lange-Vester / Teiwes-Kügler 2014, transl. by authors), Awareness of Heterogeneity underlines an increasingly differentiated perception of differences. And it says, that as a second step, what has been perceived, becomes evaluated by the individual. This idea is also part of the construct “Awareness of Difference” (“Differenzsensibilität”) (Eppstein 2013; transl. by authors).

In accordance with Bohl, Budde and Rieger-Ladich (2017), Awareness of Heterogeneity finally describes the perception of heterogeneity within a specific group of pupils in a concrete situation by the (prospective) teacher, as well as the recognition of its significance for teaching and learning. It implies a differentiated view on a preferably great variety of dimensions, as well as reflection by the teacher on the possible relevance, relations and interdependencies of the latter (Schmitz / Simon / Pant 2019:186).

The empirical operationalization of the construct Awareness of Heterogeneity is based on the distinction of four, cyclically successive facets, that constantly affect one another: (1) Presuppositions, (2) Perception, (3) Ranking, and (4) Evaluation (Schmitz / Simon / Pant 2020a:22). First, it is of interest, how (prospective) teachers imagine a regular group of pupils. Which dimensions of heterogeneity do they expect to find? Second, affected by their expectations, the teachers meet a group of pupils and make certain observations. Which dimensions of heterogeneity do they detect in a specific group in a concrete situation? Third, these recently perceived dimensions are systematized in terms of importance by the teachers in order to maintain an overview. Which dimensions do they rank as most relevant? Fourth, the idea of teaching heterogeneous groups gets evaluated. How far do (prospective) teachers consider it an enrichment and a challenge? Here, the concepts of enrichment and challenge

are not understood as opposite extremes of one scale, but as independent. Finally, the evaluation can have an impact on the presuppositions, and the cycle starts again.

### 4. Empirical Findings on Prospective Schoolteachers’ Awareness of Heterogeneity

Approaches to prepare prospective teachers for their task of teaching heterogeneous groups have recently become an essential component of teacher education at German universities (cf. the recommendations of the Conference of the Ministries of Education and Cultural Affairs (KMK) and the German Rectors’ Conference (HRK) about Teacher training for a school of diversity in 2015). They aim at fostering the students’ adaptive teaching competence (see chap. 1) and understand Awareness of Heterogeneity as a central precondition (Welskop / Moser 2020). Therefore, it has been of interest to generate empirical data on how this construct is developed among prospective teachers in education. Based on the operationalization by four facets, a test instrument was designed (Schmitz / Simon / Pant 2020a:21-44) and applied in a few surveys at Humboldt-Universität zu Berlin (Schmitz / Simon / Pant 2019; Schmitz / Simon / Pant 2020b). In the following discussion of findings, the focus will be on those presented in chap. 4.5, as they are most recent and refer to a so far unpublished supplement to the fourth facet.

#### 4.1 Presuppositions

Which expectations do prospective schoolteachers have regarding heterogeneity among pupils?

##### *Method and Sample*

This facet was referred to by one open item, which is embraced by an introduction and an instruction: “In the context of inclusive teaching, heterogeneous learning groups are often mentioned. According to your personal imagination: Which differences occur in heterogeneous learning



groups? Please give as many answers in key points as it corresponds to your imagination” (Schmitz / Simon / Pant 2020a:23; transl. by authors). It is placed at the beginning of the questionnaire, so that the respondents’ ideas have not been influenced yet.

The data was collected at Humboldt-Universität zu Berlin in April 2018. The respondents ( $N = 241$ ) were student teachers for different subjects. They were between 19 and 56 years old. 22% of them were male and 73% were female. 15% recorded a migration background and 12% spoke a second or another native language than German. 27% of the respondents indicated, they had never taught at a school and 20% said they had no practical experience with heterogeneous learning groups yet.

### Results

All in all, the students named 22 dimensions of heterogeneity, which they expected to find in the classroom.

Figure 1 presents those that were mentioned by at least 20% of the respondents.

The respondents showed a wide spectrum of dimensions of heterogeneity which they imagined finding in the classroom. This spectrum includes the classic ones such as Gender and Age, as well as superordinate categories (such as Social-Economical Status) and direct learning conditions (such as Cognitive Learning Conditions). They used a value-free language, not referring to any comparable status of normality (Heinzel / Prengel 2012; Lang et al. 2010). Moreover, they expressed a wide understanding of inclusion, where Disabilities constituted one but not the most frequently mentioned category of interest. From a Cultural Sciences point of view, it is interesting that some of their traditional categories were present here: (Country or Region of) Origin, Ethnic Affiliation, Religious Affiliation and Culture. The latter stands for values, traditions and rituals of the pupils and their family collectives.

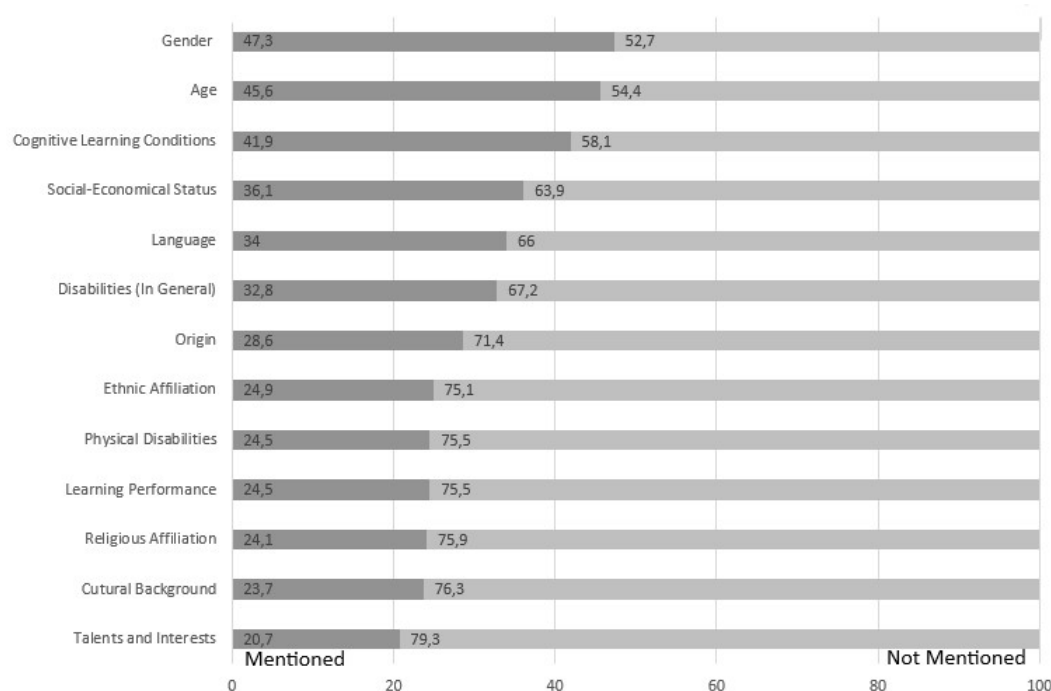


Figure 1: Presuppositions: Frequencies of Mentioned Dimensions of Heterogeneity by the Respondents ( $N = 241$ ) in Percent (Schmitz / Simon / Pant 2020b, p. 116; transl. by authors).

## 4.2 Perception

Which dimensions of heterogeneity do these prospective schoolteachers detect in a concrete classroom situation with a specific group of pupils?

### *Method and Sample*

In order to find out more on their perception of heterogeneity in a concrete setting, a case example was given to the respondents. It describes a classroom situation of group work, that implicitly addresses 16 dimensions of heterogeneity. The respective item and instruction are as follows: “Which differences do you perceive within these three learning groups? Please give as many answers as you can find in key points. It is not necessary to assign your answers to groups or pupils’ names” (Schmitz / Simon / Pant 2020a:27-29; transl. by authors). Data collection and sample ( $N = 241$ ) were just as described in chap. 4.1.

### *Results*

Human perception is known to be limited and selective (Ansorge / Leder 2011). The facet of Perception aims at describing the limits, respectively largeness of capacity. Therefore, it was counted, how many dimensions of heterogeneity the respondents detected, regarding the case example (Schmitz / Simon / Pant 2020b:118 f.). Table 1 presents the descriptive statistics.

Minimum	0
Maximum	14
Median	5
Mode	4
Mean	5.5
Standard Deviation	2.32

Table 1: Perception: Descriptive Statistics on How Many Dimensions the Respondents ( $N = 241$ ) Detect in the Case Example.

The majority of the respondents detected four dimensions of heterogeneity in the case example. This constitutes a fourth of all 16 present ones and can be considered a rather small selection.

## 4.3 Ranking

Which of the detected dimensions of heterogeneity do these prospective schoolteachers find most relevant?

### *Method and Sample*

Subsequently, the respondents were asked: “Regarding your previous answers: Which three differences do you consider most relevant to inclusive teaching? Please put them in an order of decreasing relevance. Please name only three” (Schmitz / Simon / Pant 2020a:33; transl. by authors). Data collection and sample ( $N = 241$ ) were as described above.

### *Results*

Three dimensions of heterogeneity were most present on all three ranks. First, Cognitive Learning Conditions were named (21% of respondents put it at first place). This dimension includes cognitive parameters, such as the capability to focus and concentrate, or the quickness of comprehension. In the case example, this dimension was addressed by a pupil who has a high affinity to numbers and does not like writing. Second, Motivation was considered very relevant (9.5% of the respondents ranked it first). In the case example, this dimension was represented by a pupil who is bored while the others want to start working. Third, Physical Disability was found important (8.3% of the respondents put it first). This dimension referred to a pupil in the case example, who is hard of hearing and does not directly understand the task described by the teacher. The selection of these three dimensions shows that in a concrete classroom situation, those that have a direct impact on teaching and learning, are considered most relevant. Subordinate categories, such as the Ethnic and Religious Affiliation or the Economic Background of pupils, which can have a mediate impact or which might become virulent in specific situations, were not ranked as important (Schmitz / Simon / Pant 2020b:120).

## 4.4 Evaluation

Do the prospective schoolteachers estimate the teaching of heterogeneous classes as a challenge and/or as an enrichment?

### *Method and Sample*

This question is located in social-psychological attitude research. The concepts of challenge and enrichment are now understood as independent, meaning that the mission of teaching heterogeneous classes can be a challenge and an enrichment at the same time. Each concept is reflected by one Likert-scale of 5 items; the scales are compositely presented, and the response options range from 1 to 6 (with 6 representing highest approval) (Schmitz / Simon / Pant 2020a:40). The items are based on replications of the sub scales by Hartinger, Grittner, Lang and Rehle (2010), adapted by Simon (2019a, 2019b). They do not mention any concrete dimensions of heterogeneity, so that the situation previously described in the case example still provides a comparable reference point to the respondents. Data collection and sample ( $N = 241$ ) were as described above.

### *Results*

An Exploratory Factor Analysis (PCA, Varimax) confirmed the structure of the scales. Their internal consistencies were satisfactory ( $\alpha = .74$  and  $\alpha = .77$ ). Table 2 presents Mean and Standard Deviation for both scales.

	Challenge	Enrichment
Mean	4	4.3
SD	.87	.96

Table 2: Evaluation: Mean and Standard Deviation for the scales “Teaching of Heterogeneous Groups as a Challenge and/or Enrichment” ( $N = 241$ ).

On the response scale from 1 to 6, the theoretical center is 3.5. Both means can be considered medium till high. This means that the prospective teachers, by the end of the questionnaire, consider the mission to design and conduct lessons for a heterogeneous group

of pupils quite a challenge, and at the same time an enrichment.

One striking finding of an intervention study at Humboldt-Universität zu Berlin in 2018 was, that students who had an extra course on how to teach heterogeneous groups, afterwards called it a low enrichment and a high challenge. This was in comparison to how they had felt before the extra course and compared to a control group that did not get any input (Schmitz / Simon / Pant 2020b). One interpretation of this finding is, that the extra course made them aware of the complexity of the task to teach heterogeneous groups. Furthermore, it raised the question, if the evaluation varies with certain (kinds of) dimensions in mind.

## 4.5 Differentiated Evaluation

Does the estimation of heterogeneous classes in terms of enrichment and challenge vary with the consideration of certain dimensions of heterogeneity?

### *Method and Sample*

In a following step, the scales to measure the estimation of teaching heterogeneous classes as an enrichment, respectively a challenge, were supplemented by a specification of dimensions of heterogeneity. Similar to the work of Gebauer, McElvany and Klukas (2013), who distinguished between cultural, social and performance related dimensions, five categories of dimension kinds were built: (1) Ethnic-Cultural, (2) Social-Familiar, (3) Learning and Performance Related Differences, (4) Special Educational Needs and (5) Differences in Motivation. These categories were inductively generated, based on the data described above.

A questionnaire was designed as follows. Each category was introduced by a subtitle, followed by a description, an explanation of the 0-5 Likert response scale and the 10 items. These items were the ones applied in chap. 4.4, now explicitly referring to certain kinds of dimensions. With each category the



reference point of imagination varied; apart from this, the items were repeated equally. Figure 2 illustrates the design and presents the items by the example of category (1) Ethnic-Cultural Differences. Table 3 lists the descriptions of the other four categories.

**1/5) About Ethnic-Cultural Differences**

By "ethnic-cultural ", we mean the national origin, native language, religion and traditions of pupils.

How far do you agree with the following statements? Please mark with a cross where applicable.

①	②	③	④	⑤
Does not apply at all.				Does completely apply.

**Significant ethnic-cultural differences within a learning group...**

... require an unworkable big variety of ideas for the design of lessons from the teacher.	① ② ③ ④ ⑤
... allow the pupils to learn from each other.	① ② ③ ④ ⑤
... mean a broaden of horizons for the learning group.	① ② ③ ④ ⑤
... complicate the smooth course of lessons.	① ② ③ ④ ⑤
... inspire the teacher to innovate the design of lessons.	① ② ③ ④ ⑤
... result in an insufficient encouragement of some pupils.	① ② ③ ④ ⑤
... imply unpredictable challenges for the teacher.	① ② ③ ④ ⑤
... mean an unreasonably time-consuming preparation of lessons for the teacher.	① ② ③ ④ ⑤
... allow new opportunities for the encouragement of all pupils.	① ② ③ ④ ⑤
... set the basis for an harmonic learning atmosphere.	① ② ③ ④ ⑤

Figure 2: Extract of the Questionnaire: The Example of Category (1) Ethnic-Cultural Differences (transl. by authors).

Category	Description
(2) Social-Familiar Differences	Life situation, living conditions, educational background, and socio-economic situation of the pupils' families
(3) Learning and Performance Related Differences	Cognitive learning conditions, such as the quickness of comprehension, and the way of learning, such as the pace of work and preferences for certain types of work, as well as learning progress and results of pupils
(4) Special Educational Needs	Categories according to the enhancement foci defined by Land Berlin (Learning, Emotional and Social Development, Language, Mental Development, Physical and Motorical Development, Vision, Hearing and Communication, Autism)
(5) Differences in Motivation	Willingness of pupils to more or less participate in the lessons

Table 3: Categories 2-5 and their Descriptions in the Questionnaire (transl. by authors).

The data was collected in June 2020 among teaching students at Humboldt-Universität zu Berlin ( $N = 156$ ). The respondents were specializing on a great variety of subjects, ranging from German and English, Mathematics and Biology to Arts and Physical Education. 60.9% of the respondents were Master, and 39.1% were Bachelor students. 25.6% of them were participating at seminars on the topic of inclusive education, and 59.6% indicated they had a rather low theoretical knowledge on the topic.

#### *Statistic Quality Criteria*

Regarding the category (5) Differences in Motivation, two items showed a low level of selectivity, and an Exploratory Factor Analysis (PCA, Varimax) showed that the items of the two mixed scales loaded on three, not two factors. Consequently, the data collected on this category will be excluded from the analysis presented here. Moreover, in order to theoretically clarify this category, the description was modified for future data collections. For the sake of theoretical completeness, the category description presented in Table 3 is the updated one. The items of the other four categories showed the expected two-dimensional structure, satisfactory item difficulties and selectivity and the scales had high values of internal consistence.

## Descriptive Statistics

Table 4 presents Cronbach's Alpha, as well as Mean and Standard Deviation for each sub-scale.

Category and Sub-Scale	$\alpha$	M	SD
(1) Ethnic-Cultural Differences:			
Enrichment	.82	<b>3.6</b>	.85
Challenge	.83	<b>2.22</b>	1.05
(2) Social-Familiar Differences:			
Enrichment	.82	<b>2.98</b>	1.01
Challenge	.82	<b>2.37</b>	1.02
(3) Learning and Performance Related Differences:			
Enrichment	.8	<b>3.33</b>	.91
Challenge	.84	<b>2.6</b>	1.11
(4) Special Educational Needs			
Enrichment	.83	<b>3.43</b>	1.0
Challenge	.88	<b>2.97</b>	1.15

Table 4: Descriptive Statistics on Categories 1-4: Cronbach's Alpha, Mean, Standard Deviation ( $N = 156$ ).

On the response scale from 0-5, 2.5 is to be considered the theoretical center. All means, except the ones for (1) Ethnic-Cultural Differences as a challenge and (2) Social-Familiar Differences as a challenge, are medium and higher. Therefore, challenges and enrichments prove to co-exist at the same time. Furthermore, in the case of all categories, the enrichment is estimated higher than the challenge. And when comparing the categories with each other, (4) Special Educational Needs seem to pose the highest challenge to the prospective teachers, while (1) Ethnic-Cultural Differences scores lowest on challenge. At the same time, the latter category seems to mean most enrichment to the respondents, while (2) Social-Familiar Differences ranks least.

## ANOVA

In order to test, which of these mean differences are significant, two repeated measures ANOVAs are conducted, one for the concept of Challenge, and another one for Enrichment. In both

cases, the data meets the requirements: The samples consisted of the same respondents, and the variables are metric while the intersubjective factor is nominal, containing four categories. There were no outliers in the data. Most of the groups were normally distributed, as assessed by the Shapiro-Wilk test ( $p < .001$ ). For the other cases, the ANOVA is robust because of the sample size (Pagano 2010, Salkind 2010, Wilcox 2012). The Greenhouse-Geisser adjustment was used to correct for violations of sphericity (Girden 1992).

## Challenge: Results

A repeated measures ANOVA with a Greenhouse-Geisser correction determined that mean performance levels showed a statistically significance difference between measurements,  $F(2.68, 414.72) = 35.73$ ,  $p < .001$ , partial  $\eta^2 = .187$ . Bonferroni-adjusted post-hoc analysis revealed a significant difference ( $p < .001$ ) comparing all categories in pairs – except (1) Ethnic-Cultural with (2) Social-Familiar Differences.

In other words, depending on which category of dimensions of heterogeneity the prospective teachers have in mind, they estimate the teaching of this group to be an actual lower or higher challenge. Here, it does not make a difference to them, if they imagine a group of pupils with mostly (1) Ethnic-Cultural or (2) Social-Familiar differences; these two categories are considered to pose a similar level of challenge to the teacher. But in comparison with (3) Learning and Performance Related Differences and (4) Special Educational Needs, it is seen as a significantly lower challenge, if mostly (1) Ethnic-Cultural Differences occur in a learning group. The highest challenge, from the perspective of this sample of prospective teachers, is posed by a learning group composed by pupils with and without (4) Special Educational Needs.

### *Enrichment: Results*

Which effect does a specification of categories have on the estimation as an enrichment? A repeated measures ANOVA with a Greenhouse-Geisser correction determined that mean performance levels showed a statistically significance difference between measurements,  $F(2.42, 374.93) = 40.53$ ,  $p < .001$ , partial  $\eta^2 = .207$ . Bonferroni-adjusted post-hoc analysis revealed a significant difference ( $p < .001$ ) comparing all categories in pair – except (4) Special Educational Needs (a) with (1) Ethnic Cultural and (b) with (3) Learning and Performance Related Differences.

Rephrased, from the perspective of these prospective teachers, the occurrence of (4) Special Educational Needs in a learning group brings a similar enrichment as (1) Ethnic-Cultural and (3) Learning and Performance Related Differences. Furthermore, in comparison to (2) Social-Familiar and (3) Learning and Performance Related Differences, (1) Ethnic-Cultural Differences are considered the significantly highest. And, in comparison to all other categories, (2) Social-Familiar Differences are estimated to bring the significantly lowest enrichment to the (teaching of the) learning group.

## **5. Conclusion**

When it comes to heterogeneity, the research stream on Inclusive Education and Cultural Science have been walking similar paths. Both, so has been traced back in chap. 1, have widened their view to an endless variety of collectives, respectively dimensions of heterogeneity. According to theories and concepts dealing with multiple affiliation (e.g. the concept of intersectionality which focuses on multiple discrimination), the individual is seen as a member in many collectives, while single belongings may become (in)directly virulent in specific situations and under certain points of view. In order to foster interdisciplinary exchange, this article gave insight in

the current work on Inclusive Education. In chap. 2, their recent discourse on heterogeneity was outlined, and in chap. 3, their construct “Awareness of Heterogeneity” was described as a reflected perception of heterogeneity in the classroom by the (prospective) teacher. In chap. 4, empirical findings on each construct facet as well as on a follow-up question were presented. Prospective schoolteachers have left their traditional focus and are well aware of a great variety of dimensions of heterogeneity (chap. 4.1). In the words of Cultural Science, this corresponds to multi- and polycollectivity. In a concrete setting, they detect a rather small selection of dimensions (chap. 4.2), and they consider those most relevant, that have a direct impact on learning in that exact setting (chap. 4.3). From a Cultural Science point of view, they apply the idea of collective belongings turning virulent. They find the teaching of heterogeneous classes both an enrichment and a challenge (chap. 4.4). Both estimations vary with the category of dimensions of heterogeneity they have in mind (chap. 4.5). Here, it is an interesting side-finding that Ethnic-Cultural Differences are considered to bring most enrichment into the classroom.

Future research on heterogeneity at school might go into further detail and examine why and in which sense certain dimensions of heterogeneity are perceived as a higher challenge and/or enrichment by the teacher. The supplementary application of qualitative methods might be appropriate. Findings might be used by Universities to design classes in order to prepare prospective teachers for their task to teach heterogeneous groups. Overall, in the present context, an interdisciplinary perspective on the topic has proven illuminating, and further cooperation and exchange of concepts by Inclusive Education and Cultural Science will be valuable.

## 6. References

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## 7. Endnotes

1 It should be noted, however, that in the context of German-language discourses about school (and inclusion) this principle is also used for purposes of homogenization (for a critical point of view, see Simon 2015).