High-performing students in the 'Hauptschule' – A comparison of different groups of students in secondary education within Germany[1]

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Abstract: We take a look at mathematical achievement of high-performing students in the Hauptschule, the low track of the German educational system in secondary education. Furthermore, we compare this group with students from other systems in Germany (Gesamtschule, Realschule and Gymnasiums). Our interest is to find out differences and characteristics between the different groups. The results from the national test of PISA 2000 are the empirical basis of our analysis.

Kurzreferat: Wir untersuchen welche mathematischen Leistungen gute Hauptschüler in deutschen Hauptschulen erreichen können und wodurch sie sich von leistungsgleichen Schülerinnen und Schülern in anderen Bildungsgängen - den Gesamtschulen, Realschulen und Gymnasien in Deutschland - unterscheiden. Es werden dazu Ergebnisse des nationalen Ergänzungstests von PISA 2000 für 15-Jährige herangezogen. Einen ausführlicheren Bericht findet man unter Wynands, A. & Möller, G. (2004).

ZDM-Classification: C20, D60

1. Introduction

The results of PISA 2000 show – analogue to previous studies such as BIJU (Baumert, Gruehn et al., 1997) and TIMSS (Baumert, Lehmann et al., 1997) – that academic achievement of students at various school systems overlap a lot in Germany. In this article we take a look at the mathematical achievement of the high-performing students in the 'Hauptschule', the low track of the German educational system. We are interested in their strength und the aspects that distinguish them from the other school systems: 'Gymnasium' (high track/ grammar school), 'Realschule' (medium track) and 'Gesamtschule' (comprehensive school). The added German test of PISA 2000 for 15-years-old students is the empirical basis of our analysis.

As expected, high-performing students in the Hauptschule are spread over the states and regions in Germany. To take a closer look at the results, on the one hand, the 20% of the best students in the Hauptschule can be found in the federal states where a high proportion of students are in this system. On the other hand, the low-performing students in the Gymnasiums live in federal states with a poor result in the national test. The reported results in the following sections show also regional differences within Germany. The aim of this article is to illustrate that we have a great potential of high-performing students in the Hauptschule. The excellence of this group should be pointed out but they need additional encouragement. At the same time, we want to take a look at the achievement of student groups in other school systems.

2. The definition of comparative groups

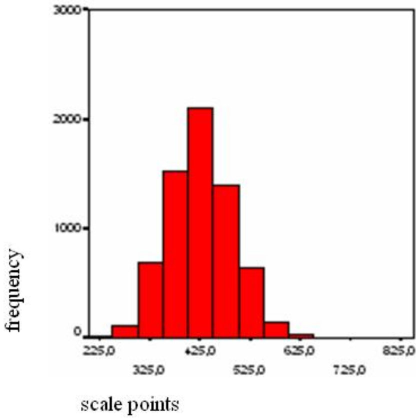
The variety of structures in the school systems of secondary education in Germany makes it difficult to discuss about *the* German system. To look at the mathematical achievement of students in the Hauptschule (HS), students who go to this school or similar ones are put into one category. We take the same strategy with students in the Realschule (RS) and Gymnasiums (GY). Students in the Gesamtschule (GS) go to an 'integrated' Gesamtschule. Figure 1 (next page) shows the distribution of the students in the different school systems. The metric of the mathematical achievement is oriented around the international part of PISA 2000 with a mean m = 500 (scale) points and a standard deviation sd = 100 (scale) points. In the additional national test in Germany, all students (N>28,000) have a mean m = 503 (sd = 88). If we take a look at the mean of different systems (HS: m = 424, GS: m = 459, RS: m = 498, GY: m = 579), we can observe a large range.

For the following analysis we want to compare the group of high-performing students in the Hauptschule with the groups of students in the Gesamtschule, Realschule and Gymnasiums, who have the same or a lower achievement. It seems to be practical to deal with the 20% of high-performing students in the Hauptschule. In our sample, approximately 1300 students are members of this group. They reach at least 478 points. The upper part of this group, the best 10% of all students in the Hauptschule, obtains more than 507 points. The comparative groups in the other systems, whose students do not reach more than 507 points, have at the most of ability of an average student in this 20%-group. Moreover, we compare this 20%-group with the whole sample of the other systems. The overlapping between the different systems form statistical useful samples. Already 40% of students in the other systems do not reach the same level as the 20% of the best students in the Hauptschule. In detail (figure 2a next page), 61% of the students in the Gesamtschule, 38% of students in the Realschule and 5% of students in the Gymnasiums are under the level of our surveyed group. On the basis of the 10%-level in the Hauptschule, 76% of students in the Gesamtschule, 57% of students in the Realschule and 13% of students in the Gymnasiums do not reach 507 points or more.

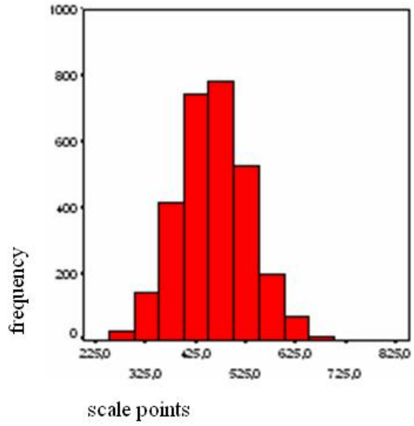
We realise that mathematical achievement in the Hauptschule can only clearly be separated from achievement in the Gymnasiums. However, even there we can find the result that the 10% best of students in the Hauptschule are better than 13% of students in the Gymnasiums.

[1] This article based on an extended version by the same authors in Wynands and Möller (2004).

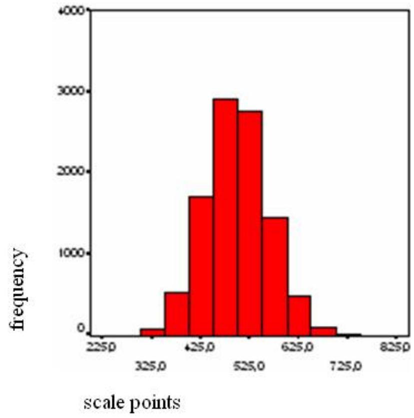
Figure 1. Distribution of the students in the different school systems in Germany.



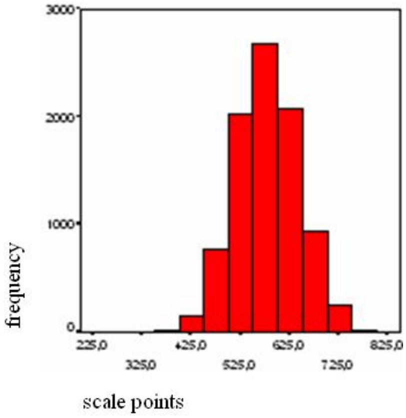
a) Hauptschule: N = 6691, m = 424.4, sd = 64.2



b) Geamtschule: N = 2917, m = 459.2, sd = 70.5



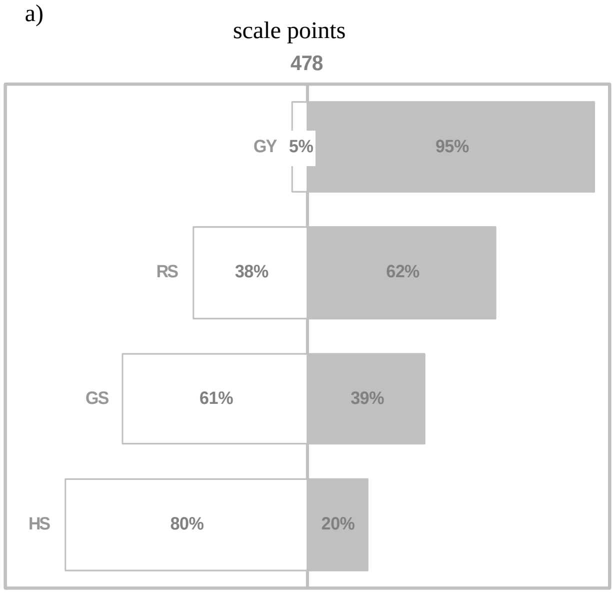
c) Realschule: N = 10002, m = 497.8, sd = 64.2



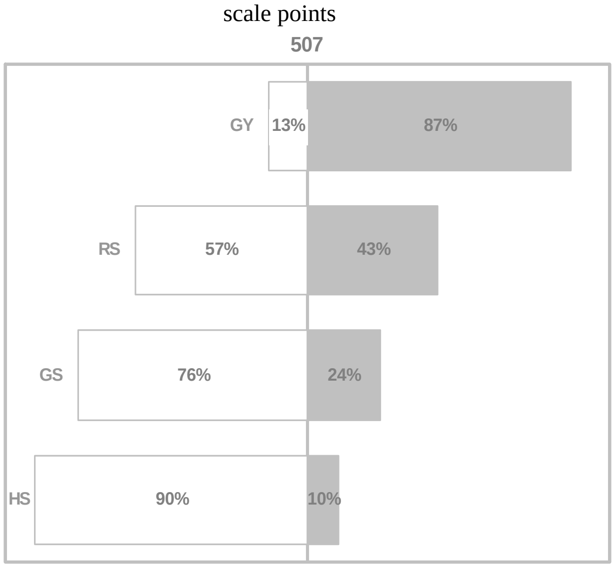
d) Gymnasiums: N = 8918, m = 579.2, sd = 63.7

Figure 2. The overlapping of achievement between the different systems in mathematics

a)



b)



During the next sections we will describe the groups with the following abbreviations:

- HS-20% (HS-10%): group of the 20% (10%) high-performing students in the Hauptschule with more than 478 (507) points.
- GS-507 (RS-507, GY-507): group of students in the Gesamtschule (Realschule, Gymnasiums) with a maximum of 507 points.

On average, the 20% of high-performing students in the Hauptschule obviously obtain better results than students in the comparative groups. In detail:

HS-20%: m = 515, sd = 32.3; GS-507: m = 429, sd = 49.7
RS-507: m = 453, sd = 39.2; GY-507: m = 475, sd = 27.4

It is remarkable, that the mean of GS-507 (these are 76% of students in the Gesamtschule) are close to the mean of all students in the Hauptschule (m = 424).

First conclusion:
All students in the Hauptschule reach almost the same level as the large sample of students in the GS-507-group (76%). Moreover, there are far more less achieving students in the Gesamtschule than in the Realschule. The best students are mostly in the Gymnasiums, but 13% of them are below 10% of the best students in the Hauptschule and below 40% of the students in the Realschule. In the Realschule 57% of the students are below 10% of students in the Hauptschule. Even 38% of students in the Realschule are below 20% of students in the Hauptschule.

3. Mathematical competences in the comparative groups

In this section we want to take a look at the specific abilities of the best students in the Hauptschule, in contrast to the comparative groups.

3.1 Types of mathematical work

The national items of PISA 2000 are classified in three types of mathematical work (cf. Klieme, Neubrand, & Lüdtke, 2001; Knoche et al., 2002; Wynands & Neubrand, 2003, chapter 1 & 2):

Type 1 *technical items*: skills and knowledge of routines and algorithms are needed;

Type 2 *procedural modelling items*: a problem has to be solved by modelling the situation, whereby the solution can mostly be found with arithmetical skills and abilities;

Type 3 *conceptual modelling items*: a problem has to be solved, whereby the solution can mostly be found with a conceptual resource. Arithmetical skills are primarily not needed. These kinds of items are often connected with divergent thinking and arguments.

Typical examples for technical items in type 1 are 'calculation' and 'multiplication':

Calculation
Calculate and mark the correct answer:
$4 + 3 \cdot (2 + 1) =$
(mc: 11; 13; 14; 15; 21)

Multiplication
Multiply and mark the correct answer:
$(2x - 3y)^2 =$
(mc: $4x^2 - 9y^2$; $4x^2 + 6xy - 9y^2$; $4x^2 - 6xy + 9y^2$; $4x^2 - 12xy + 9y^2$; $4x^2 - 12xy - 9y^2$)

Typical examples for procedural modelling items are the following basic items of percentage calculation. Additional to arithmetical skills, students need the ability to transpose between the real situation and a mathematical model.

Bottle
1.) A manufacture produces 8000 bottles per diem. 2% of these bottles are faulty. How many bottles are faulty?
(mc: 16; 40; 80; 160; 400 bottles)
2.) A manufacture produces bottles. 2% of these bottles are faulty, these are 160 bottles. How many bottles does the manufacture have produced?
(mc: 320; 800; 3200; 8000; 12500 bottles)
3.) A manufacture produces 8000 bottles per diem. On average, about 160 bottles are faulty. What about the percentage of the faulty-proportion?
(mc: 0.02%; 0.5%; 1.28%; 2%; 5%)

The items 'Half' and '31 cents' are examples for conceptual modelling in type 3.

Half
What about different spellings of "half of number a"? Mark "yes" or "no" at each answer.
a) $\frac{a}{2}$; b) a-$\frac{1}{2}$; c) $\frac{1}{2}\cdot$a; d) a-$\frac{a}{2}$; e) 0.5$\cdot$a; f) a:$\frac{1}{2}$; g) $\frac{1}{2}$a

31 cents
You have 10-cents-coins, 5-cents-coints and 2-cents-coints. Write down **all** opportunities to lay down 31 cents with these coints.

At the following item part 1 and 2 belong to type 2; part 3 belongs to type 3.

You have a closed string with 12 knots. The distance between neighboured knots is 1 cm each. With this string it is possible to arrange figures with knots at each corner. *(Annotation: Figure with a closed string and 12 knots illustrated the statement.)*
1.) You can arrange a square with the string. Sketch the square. What about the area of this square?
2.) You can arrange a triangle with the string. Sketch, how to arrange an acute triangle.
3.) Is it possible to arrange a right triangle with the string? Make a sketch und give reasons for your answer.

3.2 Competences

Table 1 gives an overview about the competences of all students in different systems and especially in the surveyed groups. The gradient of mathematical achievement from Gymnasiums up to Gesamt- and Hauptschule is almost equal in the three types. The largest difference can be observed in technical items with more than 200 points (i.e. 2 standard deviations). We find the lowest difference in items of procedural modelling.

Table 1. Means of competences of all students in different systems and in the surveyed groups.

	technical items	procedural modelling items	conceptual modelling items	all items
GS-507	423	427	437	429
RS-507	460	453	450	453
GY-507	507	470	487	475
HS 10%	497	567	503	539
HS 20%	473	537	487	515
GS	453	457	463	459
RS	500	497	490	498
GY	600	570	577	579
HS	400	437	427	424

The mean of technical skills differ with 1 deviation especially for students in the Gymnasiums from the mean of students in the Realschule. Below that, the mean of Gesamtschule and Hauptschule follow with 0.5 deviations, respectively. There is a minor difference in procedural modelling items between the systems. The results for conceptual items are similar to technical items. The mean in the last column in table 1 reproduce the same data from figure 1 for the whole sample.

Figure 3 shows the difference in competences between school systems. We pay particular attention to the results of the HS-20%- and HS-10%-group in contrast to the comparative groups: In technical items the level of HS-20%-students is a little bit higher than for RS-507-students; it is marginal under the GY-507-level but clearly above the GS-507-level.

Figure 3. Means of competences of all students in different systems and in the surveyed groups (m = 500; sd = 100).

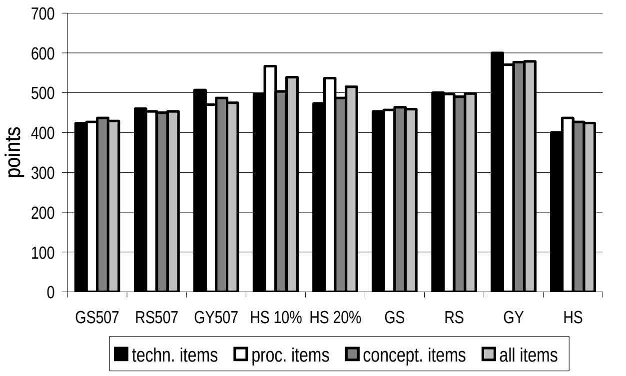
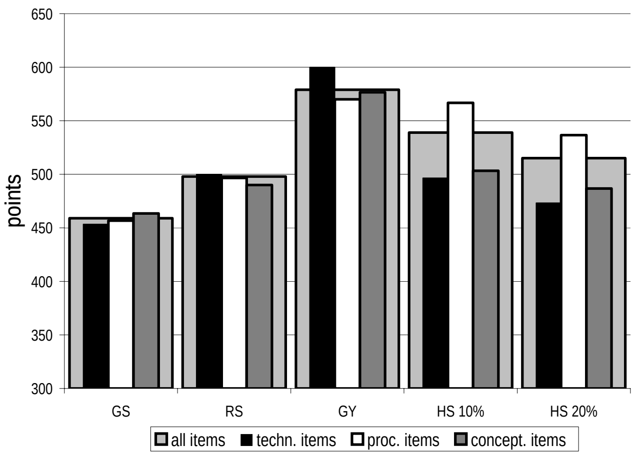


Figure 4. Means of competences of all students and in the HS-10%- and HS-20%-group for all items and in different item groups. (m = 500; sd = 100).



It becomes obvious in figures 3 and 4 that the potency of the HS-20%-group is in the field of procedural modelling items. Students in the Realschule and Gymnasiums have a similar achievement level. Any fourth student of RS-507 and GY-507 obtains approximately the competence of 75% of HS-20%-students. The lowest performer is obviously the GS-507-group. In contrast, the competences in conceptual items do not differ that much. We realise that the competences between HS-20% and GY-507 are almost the same.

Second conclusion:
It is remarkable, but not surprising that there are differences between school systems, if we take a look at all students. Between students in the Hauptschule and Gymnasiums we find two deviations between the mean of these groups in technical items. In procedural modelling the mean differs to one deviation or in conceptual modelling to 1.5 deviations.

If we take a deeper look at our interested subgroups, the HS-20%-group does surprisingly well in procedural modelling in contrast to the comparative groups. The HS-20%-group is one deviation above the students from the GS-507. The distance to RS-507 and GY-507 is nearly the same. These results apparently show specific aims of teaching mathematics in the Hauptschule. Moreover, the HS-10%-students have the same procedural modelling skills as the average students in the Gymnasiums. Obviously, on the basis of higher technical and formal competences students in the Gymnasiums show a higher test achievement than other.

4. Special results for mathematics in schools and students' careers

4.1 Demand and support in mathematics

In the following section, we take a deeper look at the different kinds of support and demand of students in school. The results show how students perceive their schools, teachers and instructions.

At first, we look at the extent of extra-curricular tutoring: 8% of students in the Hauptschule get this kind of support; in the HS-20%-group we find 5%, in GS-507 9%, in RS-507 15% and in GY-507 28%. In other words: students in the Gymnasiums get 5- to 6-times more support in extra-curricular tutoring than students in the Hauptschule on a corresponding level. This means, the pressure within the class to be better has an obvious effect on students in the Gymnasiums. The results impose the question about the understanding in mathematical work of these students in the comparative groups, and the degree of support and demand within school. It is questioned in PISA 2000 (cf. Kunter, M. et al. 2002, p. 270):

Have you ever switch off in mathematics due to …
(1) … extreme demand?
(2.) … boredom?
(rating: 1-never, 2-rarely, 3-sometimes, 4-often, 5-very often)

Furthermore, it is questioned the intensity of exercises (cf. Kunter, M. et al. 2002, p. 269). Therefore, three items are combined:

In our math class …
(1) … we do move on slowly because we have many exercises and repetitions.
(2.) … we always exercise the items from our lesson again.
(3.) … we get many exercises from our teacher.
(rating: 1-never, 2-in some lessons, 3-in many lessons, 4-every lesson)

The students' rating does not really differ. The means are from 1.9 in GY-507 up to 2.2 in HS-20%.

Ambitious exercises are elements of a high quality in mathematics. Three items are questioned in this field in PISA 2000 (cf. Kunter M et al. 2002, p. 270):

In our math class …
(1) … we always get ambitious items in exercises, wherein you can control your kind of understanding.
(2.) … we always transfer the learning matter to unknown contexts.
(3.) … the exercises are mostly similar, but sometimes they differ thus you have always pay attention.
(rating: 1-never, 2-rarely, 3-sometimes, 4-often, 5-very often)

Table 2. Lack of understanding, boredom, intensity of exercises and ambitious exercises in the comparative groups (in %).

	Switch off due to excessive demand		Switch off due to boredom		Intensity of exercises	Ambitious exercises
rating	1+2*	5*	1+2*	5*	3+4**	3+4+5*
all in HS	56	8	43	13	7	7
HS-20%	71	4	42	15	6	13
GS-507	49	9	42	12	4	14
RS-507	42	11	40	12	14	15
GY-507	29	18	35	16	1	14

* 1-never, 2-rarely, 3-sometimes, 4-often, 5-very often
** 3-in many lessons, 4-every lesson

Table 2 shows the results of these concepts (lack of understanding, boredom, intensity of exercises and ambitious exercises; data in %). We can see that HS-20%-students do not switch off due to their extreme demand. Those are obviously not able to reach their mathematical potential. In contrast, GY-507-students (18%), RS-507-students (11%) and GS-507-students switch off because of extreme demand, but only 4% of students in the Hauptschule.
Are HS-20%-students inadequately stimulated or are they simply in the wrong system?
Students are rarely bored during mathematical exercises. We can find the lowest proportion of these students in the Gymnasiums (1%) and the highest proportion in the Realschule (14%). Demanding exercises with regard to comprehension and transfer are obviously rare in all systems. Only 14% of the HS-20%-students report of such exercises "some times", "often" or "very often". Here, we can also find no differences between the Realschule, Gymnasiums and Gesamtschule.
Furthermore, the students are questioned about the excessive demand in mathematics. Our previous appreciation is impressively supported by the results (cf. Kunter, M. et.al. 2002; p. 267).

We can summarise the results as follows (the mean is based on a 4-step scale from 1 ("never") to 4 ("very often/ every lesson"):

- In the HS-20%-group 13% are faced with many demands; 5% are faced with too many demands (m = 1.9).
- In the GS-507-group 24% are faced with many demands; 9% are faced with too many demands (m = 2.2).
- In the RS-507-group 30% are faced with many demands; 3% are faced with too many demands (m = 2.3).
- In the GY-507-group 40% are faced with many demands; 20% are faced with too many demands (m = 2.4).

The high proportions of the low-performing students in the Gymnasiums, who report of an excessive demand, pose the question of these results for all students in the Gymnasiums. The proportion decreases to half; even more than 23% of all students in the Gymnasiums still feel overtaxed.

Furthermore, lessons should have a clear structure, obvious and understandable rules, and instructions should be coherent and carried out (cf. Kunter,M. et. al. 2002, p. 266). Students in the Gymnasiums report the worst values in this field of interest. For example, only 14% of the GY-507-students mentioned, that "at every or the majority of lessons" the teacher has "planned the lessons carefully", there exist "any kind of rules" and they have "clear instructions for working". In the other comparative groups the proportion is already 20%. With respect to the mean, the differences are not obvious: GY-507 has m = 2.4, the other groups have approximately m = 2.6.

What about the received support from teachers at school? There are the following questions in PISA 2000 (cf. Kunter, M. et al. 2002, p. 263):

Our teacher in mathematics…
(1) … is interested in the individual progress of students.
(2.) … gives opportunities to speak students' mind.
(3.) … support students' work.
(4) … explains as long as we need to understand.
(5) … attempts a lot to help us.
(6) … support students' learning.
(7) … gives useful hints of individual work.
(rating: 1-never, 2-in some lessons, 3-on many lessons, 4-every lesson)

We find significant differences between our comparative groups. In the Hauptschule and Gesamtschule the students receive to more support from their teachers than in the Gymnasiums and Realschule. Means in detail:

- HS-20%: m = 2.7
- GS-507: m = 2.6
- RS-507: m = 2.5
- GY-507: m = 2.3

At the most support (rating 3 + 4) receive to the HS-20%-group 29% of the students, GS-507-group 28% of the students, RS-507-group 23% of the students and GY-507-group 15% of the students.

Third conclusion:

HS-20%-students do not switch off due to the extreme demand in mathematics. In fact, the majority do not reach their potential. In contrast, more students in the Gymnasiums (18%) who are on the same level switch off due to their lack of understanding. Many students in the HS-20% do not seem to be stimulated enough; lots of low-performing students in the GY-507 are faced with too many demands.

Students are rarely bored during exercises, especially in the Gymnasiums (1%). Ambitious exercises which place emphasis on comprehension and transfer are rare in German schools. Only 14% in the HS-20%-group report demanding exercises to be "often" or "very often". There is no difference between Gymnasiums, Realschule and Gesamtschule. Furthermore, in our comparative groups in the Hauptschule and Gesamtschule students receive to more support from their teachers than in the Gymnasiums and Realschule.

4.2 Profiles of self-regulated learning

Artelt, Baumert and McElvany (2003a, pp. 153 ff) demonstrate profiles of self-regulated learning in different states within Germany. We will take a look at these profiles in respect of our comparative groups. The ability to regulate this process of learning is important for students to be successful in school. Weinert (1982) defines learning as self-regulated, if the learner is able to control essential decisions for his own process; these decisions are 'if', 'what', 'why', 'how' and 'whereupon' the learner is able to learn. The eleven scales of self-regulated learning mentioned in this article are each based on four to five questions or statements. The scales can be arranged in three categories. In the following paragraph, a typical item is presented to characterise each scale. For each question (or statement) there exist four alternative suggestions for an answer. We show examples of these alternatives in three scales. For more detailed information take a look at Artelt, Baumert, McElvany and Peschar (2003) and Kunter et al. (2002).

Strategies of cognitive and meta-cognitive learning
Strategies of repetition:
When I learn, I repeat the learning matter again and again.
Strategies of elaboration:
When I learn, I think about the structure and connection between old and new learning matter.
Strategies of control:
When I learn, I try to find out the reasons for my lack of understanding.
(rating: 1-almost never, 2-sometimes, 3-often, 4-very often)

Self-oriented cognition
Beliefs in self-efficacy:
I am sure I understand the basic learning matter.
Verbal self-concept:
I learn German quickly.
Mathematical self-concept:
I have always been a good student in mathematics.

Academic self-concept:
I learn most of my subjects quickly.
(rating: 1-not correct, 2-rarely not corrects, 3-rarely correct, 4-correct)

Motivational preferences and volition
Interest in reading:
When I read, I forget everything around me.
Interest in mathematics:
Mathematics is important for me personally.
Instrumental motivation:
I learn to get a good job.
Effort and enduringness of learning:
When I learn, I continue learning even if the learning matter is difficult.
(rating: 1-not correct, 2-rarely not corrects, 3-rarely correct, 4-correct)

The theoretical mean of each scale is 2.5. For example, in the scale 'interest' a value $x < 2.5$ represents 'no interest', a value $x > 2.5$ represents 'high interest'. The minimum in each scale is 1 and the maximum 4. Scales which measured strategies of learning can be interpreted as frequency of occurrence. In this case, the value 1 means 'low occurrence' of a strategy and the value 4 'high occurrence' (i.e. in regular intervals of time)

Figure 5 shows the mean of the scales of comparative groups in the systems. With an aim to compare the scales, we have to transform the mean of the whole sample to '0' and the standard deviance to '1'.

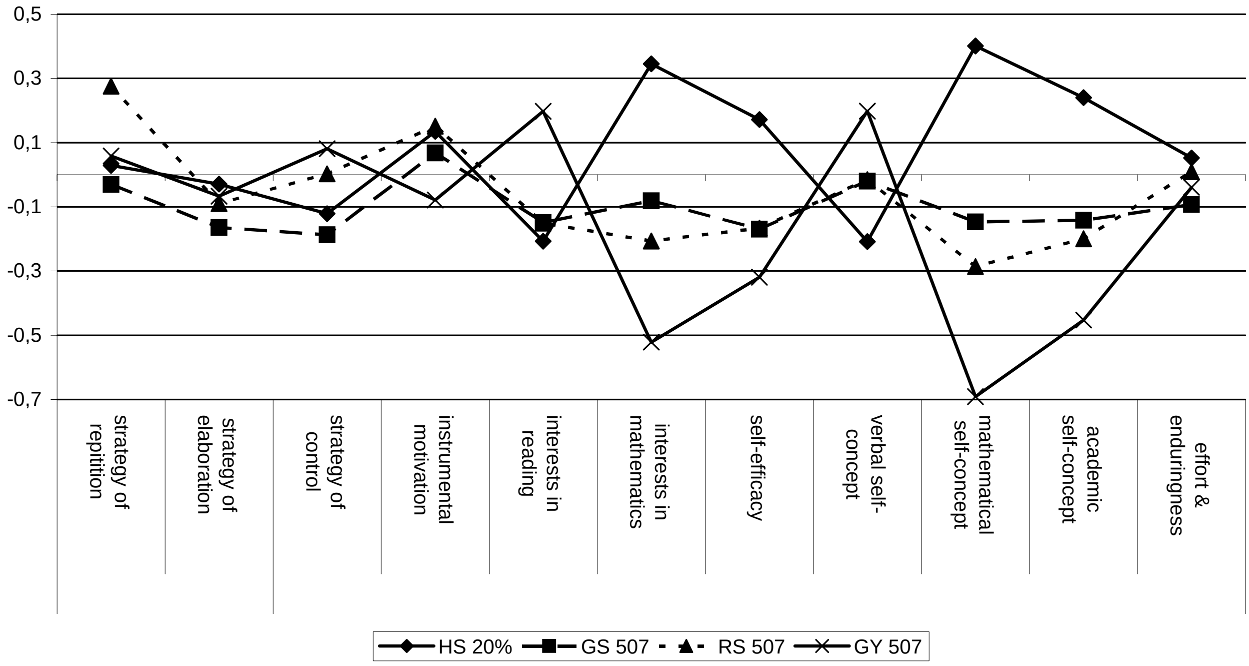
For the interpretation we have to note that the values are self-reported evaluations of students. These evaluations can be positive or negative because students with the same ability can perceive it in a different way. An essential factor for these evaluations is the performing level of the different classes. We can find various literary proofs for these so called "big fish–little pond"- or "little fish–big pond"-effects (cf. Marsh & Hau 2003; Marsh, Köller & Baumert 2001).

On the basis of the eleven scales, we can see in figure 5 that the low-performing students in the Realschule and Gesamtschule have similar profiles of self-regulated learning. In a more detailed comparison, students in the Realschule have higher values in strategies of control and repetition, whereby students in the Gesamtschule have higher values in the field of interest and self-concept in mathematics.

In contrast to Realschule and Gesamtschule, students in the Hauptschule have in general higher values if interest in mathematics (approx. 0.4 sd), self-efficacy, a general academic self-concept and especially in mathematical self-concept (approx. 0.5 sd). Within these comparisons the students have lower values in verbal self-concept and interests in reading.

It is remarkable that students in the Gymnasiums have significant higher values in interests in reading and verbal self-concept than the comparative groups in the other systems. These results are correlated with the highest achievement in reading for students in the Gymnasiums. Conversely, students in the Gymnasiums have the lowest values in the mathematical scales of interests and self-concept and, moreover, in general academic self-concept.

Figure 5. Profiles of self-regulated learning in the comparative groups (z-standardised for each scale)



The differences in comparison to the high-performing students in the Hauptschule are significant 0.8, 1.1 and 0.7 sd in the mentioned scales.

In order to valuate these results, we need to compare the profiles of self-regulated learning in the Hauptschule, Realschule, Gesamtschule and Gymnasiums which is based on the whole sample. Even there, the means of interest in mathematics, mathematical self-concept and academic self-concept for all students in the Gymnasiums are surprisingly lower than the means of the high-performing students in the Hauptschule

Fourth conclusion:
In the scales of mathematical interest, mathematical self-concept and academic self-concept, students in the HS-20%-group are distinguished from other groups, especially students in the Gymnasiums, by high values. The scales of strategies in regulated and controlled learning, interest in reading and verbal self-concept are based on attributes which force higher achievement in school. Artelt, Baumert and McElvany (2003) show these correlations in cluster analysis and structural models in the field of reading literacy. With an aim to implement these attributes into schools, we have an opportunity to also support students in the Hauptschule in reading, who are high-performing, motivated and interested in mathematics.

Figure 5 illustrated that all systems besides the Gymnasiums have to increase their effort to implement the use of more effective strategies in learning and controlling. If it is possible to activate these kinds of strategies, then we may obtain better results in learning. The inversion is probably even correct. To reach these aims,further research is needed in regards to successful methods of support.

5. Summary

The reported descriptive results show what high-performing students in the Hauptschule are capable of (under the right conditions). 20% of the best German students in the Hauptschule have the same achievement potential as 76% of all students in the Gesamtschule, 57% of all students in the Realschule and 13% of all students in the Gymnasiums. The particular strength of these HS-20%-students is in the field of procedural modelling items. On average, they reach scores of their mathematical achievement up to the mean of all students in the Realschule. Furthermore, in this type of items 10% of the best students in the Hauptschule show on average the same achievement as all students in the Gymnasiums. In the conceptual modelling items the HS-20%-group show on average the same achievement as all students in the Realschule. The relative weakness of the HS-20%-students is in the field of technical items. Direct support at school should reduce these problems.

Concerning self-regulated learning, high-performing students in the Hauptschule have remarkably high values in the scales of interest in mathematics, mathematical and academic self-concept. Within these scales they exceed all students in the Gymnasiums. This result can probably be based on the "big fish–little pond"-effect. With regard to self-regulated learning, the weakness of HS-20%-group is in the field of strategies for regulated and controlled learning. It must be possible to find opportunities to implement these strategies. In this way, learning has to be more effective.

In the context of this study, it is not possible to answer the question why high-performing students who are in the Hauptschule go there. They have the potential to go to schools where they could obtain a higher grade of education, with more opportunities for the future. Perhaps answers to this question can be found when one looks at their social environment and sees the lack of institutions nearby where they can obtain higher grades. Furthermore, an answer can be found in the results of the additional German project of IGLU (cf. Bos et al. 2004), whereby the recommendation for secondary education correlates highly with the social status of students with the same ability. Additional research has to be implemented to clear up these results.

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