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Chances and Limitations of Implementing Measures of Differentiation for Gifted Children in Primary Schools: The Teachers' Part

İlkokuldaki Üstün Zekalı Öğrencilere Yönelik Program Farklılaştırma Uygulamalarındaki Şanslar ve Sınırlılıklar: Öğretmen Kısmı

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Abstract

The presented study analyzes German primary school teachers' attitudes towards several measures of internal differentiation with respect to the anticipated benefit for gifted pupils and the anticipated work load for teachers. Besides, correlations of these attitudes with teachers' statements on the frequency of adopting the measures in their own classes were inspected. One-hundred thirty-seven teachers and teacher students were interviewed with a questionnaire on the assessed consequences and the frequency of the usage of several methods of differentiation. Data analysis was done by analyses of variance and calculation of Pearson correlation coefficients. Results show that teachers, as well as teacher students, mostly assessed the listed measures of internal differentiation to be appropriate for the promotion of gifted pupils, but for teachers there were significant negative correlations between assessed work load and frequency of usage in their own classes.

Keywords: measures of internal differentiation, gifted children, primary school teachers

Öz

Bu araştırmada Almanya'daki ilkokul öğretmenlerinin üstün zekalı öğrencilere yönelik çeşitli program farklılaştırma uygulamalarının beklenen faydaları ve öğretmenler üzerinde yaratabileceği hakkındaki tutumları incelenmiştir. Bununla birlikte, öğretmenlerin tutumları ve belirtilen durumları kendi sınıflarında uyarlama frekansları arasındaki korelasyon da araştırılmıştır. Araştırma 137 öğretmen ve öğretmen adayı ile yürütülmüştür. Katılımcılara çeşitli farklılaştırma stratejilerini ne sıklıkta kullandıklarını ve iş yüklerini sorgulayan bir ölçek uygulanmıştır. Verilerin istatistiksel analizinde varyans analizi ve Person korelasyon katsayıları hesaplanmıştır. Sonuçlar göre; hem öğretmenler hem de öğretmen adayları farklılaştırma stratejilerinin üstün zekalı öğrencilerin eğitimini desteklemek için uygun olduklarını bildirmişler, öğretmenlerin iş yükleri ile stratejileri sınıflarında kullanma frekansları arasında ise negatif korelasyon bulunmuştur.

Anahtar Sözcükler: program farklılaştırmaları, ilkokul, üstün zekâlılar, ilkokul öğretmenleri

Introduction

As a consequence of the insight that the principle that "individually differentiated talent prerequisites and learning needs demand differentiated scholastic curricula and instructional strategies" (Heller, 2005, p.193) is not limited to the instruction of children with special needs caused by learning difficulties or cognitive deficits, a lot of programs, curricula and materials have also been developed to meet the needs of extraordinarily bright and talented children

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during the last decades. Nevertheless, we are still far away from a definite agreement about how special educational strategies and curriculum contents for these children should look like.

One of the controversial issues in gifted research and education policy is the question whether or not gifted children should be educated in homogenous or heterogeneous groups. Measures of homogenous grouping or external differentiation are very popular, such as e.g. special schools for gifted children, after school clubs, study groups or pull-out programs, where bright and high achieving students can work on problems or materials at their own pace at least for a limited time of the day or week.

Measures of External Differentiation

Advocates of grouping argue that increasing homogeneity and the resulting narrow range of variation of cognitive level and academic achievement in a class will produce benefits for learning that are not possible with less homogeneity e.g. an accelerated pace of instruction, avoiding frustrating passages of boredom for gifted children, optimizing methods of instruction to the needs of highly able students, more time for individualized promotion of interests, assignment of teachers specifically trained for this certain group of students, etc. From the teachers' perspective grouping seems to be a relief from organizational overload (Vock, Preckel & Holling, 2007).

Actually, teachers seem to prefer teaching homogeneous groups to teaching heterogeneous classes and there is indeed empirical evidence that ability grouping has benefits for gifted and/or high achieving students. There are studies demonstrating that students in special classes profit in their intellectual development and perform better than gifted students in regular classes (for an overview see Vock et. al, 2007, pp. 44-50). But grouping does not have a positive effect on achievement in general. In their meta-analysis of studies on the effects of different grouping settings, Kulik and Kulik (1992) found out that homogenous grouping does not seem to increase achievement in middle- and low-ability groups. There is a small positive effect in high-ability groups. Crucial conditions for distinct positive effects appear to be that the curriculum is adapted to the learning level of the group, e.g. by compacting, acceleration, and enrichment, and methods of instruction are also tailored to the target group. With respect to academic self-concept, grouping even seems to have detrimental effects for gifted students (e.g. Rindermann & Heller, 2005), though a fact that has to be put into perspective, since the academic self-concept of gifted students in homogenous learning groups is still better than that of average students (e.g. Rost & Hanses, 1994).

Arguments against homogeneous grouping often refer to the disadvantages for middle- or low-ability groups e.g. missing learning models or discrimination of children with low SES and/or migratory background in the educational system, or promoting elitist attitudes in the group of gifted children. A second class of arguments is disadvantages for teachers like decreasing motivation to teach in "rest-classes" of low achieving students or work overload

caused by the necessity of providing differentiated and challenging learning materials (see Vock et al., 2007).

A fact, which makes thinking about methods of instruction to promote gifted children in heterogeneous classrooms indispensable, is that special measures for gifted students are not always available due to financial and organizational limitations. Thus, for numerous gifted children there simply is no access to a special measure. And finally, gifted children are a very heterogeneous group with respect to both their cognitive and non-cognitive personality profiles (Solzbacher, 2006). Even in a special program children's profiles of strengths and weaknesses may be very distinct. Hence, it seems naïve to assume that teaching them in homogeneous groups will relieve teachers from the task of differentiation of materials and instructional methods.

Measures of Internal Differentiation and Individualized Instruction

In contrast to the popularity of special programs for gifted children amongst politicians and teachers mentioned above, several authors cast doubt on the assumption that there is a special gifted-child-pedagogy (Kaplan, 2003; Ladenthin, 2006). Tomlinson (1996) as well as Coleman and Cross (2005) postulate essential commonalities between good instruction in general and instruction for highly-able learners (for an overview see Endepohls-Ulpe, 2009).

Indeed, teaching students in heterogeneous classes combined with methods of internal differentiation or individualized instruction seems to have positive effects on the learning outcomes of all ability groups (Vock et. al, 2007). But crucial condition for positive effects for this integrating within class approach definitely is that "… curricular and instructional provisions for the gifted must be carefully maintained lest they disintegrate into a non-program format" (Delcourt, Loyd, Cornell & Goldberg, 1994, p. xviii, cf. Olszewski-Kubilius, 2003).

According to Coleman & Cross (2005) differentiation in classroom, which takes the needs of gifted children into account, means accepting and dealing with a wide range of ability, advanced knowledge in areas, a rapid learning rate and intense involvement in some topics. Curriculum compacting is also essential to give space for enrichment activities. Heller & Hany (1996) name individualized level of difficulty of assignments, self-regulated learning, enquiry-based learning, and resource rooms as essential aspects of a gifted friendly classroom. Montgomery (1994, p. 320) postulates three principles: 1. "The setting of different tasks at different levels of difficulty suitable for different levels of achievement." 2) "The setting of common tasks that can be responded to in a positive way by all pupils/students." 3) "The setting of common tasks to which all pupils/students can contribute their own knowledge and understanding on collaborative activities and so structure their experiences and progress from surface to deep learning and thus be enabled to achieve more advanced learning outcomes." Hertzog (1998) suggests open-ended activities as such an instrument of providing students with

tasks they can respond to on their personal level of knowledge and skills. She offers an expanded definition of open-ended activities as activities that "provide learners with choices in the content, process, or product domain".

German authors like Bönsch (2004), Reketat (2001), Schulte zu Berge (2005), and Paradies & Linser (2009), who deal with internal differentiation, frequently do so in the tradition of approaches from progressive education, which have a long history in Germany and have already reflected on the needs also of gifted children nearly 80 years ago. Internal differentiation in this tradition can happen by variation of learning pace (Busse, 2007), aspiration level (Schulte zu Berge, 2005), social form and method (Bönsch, 2004). Furthermore, provision of varying approaches to subjects (visual, auditory, action-oriented, abstract or conceptional) and methods like sharing circle, tutoring systems/cooperation, working with individual weekly schedules, free activity, project work, and enquiry based learning or open learning (self-determined, independent and interest guided) are adopted (for an overview see Schulte zu Berge, 2005).

Issue and Conception of the Study

In Germany, like in other countries with tracking systems in secondary school, primary school is usually the last stage of schooling where children of all levels of abilities are instructed in one classroom. Especially for younger children special measures for the gifted are rare, existing measures like pull-out programs have limited capacity and measures with a non-public provider are often simply too expensive for parents with limited financial resources. Thus, when aiming to meet the needs of all children, the implementation of measures of internal differentiation seems to be essential. However, with respect to differentiation and individual furtherance, in spite of the already illustrated tradition of progressive pedagogy, German primary school teachers mostly seem to focus on children with learning deficits. Possible reasons may be the above mentioned fear of work overload or simply lack of knowledge about what can be done for gifted children in a heterogeneous classroom.

Theories from the field of social psychology like e.g. Ajzen and Fishbein's (1980) theory of reasoned action, postulate that the intention to perform a certain behavior, which is correlated with performing the behavior, is amongst others determined by the anticipation of possible outcomes of performing the behavior and by the knowledge of normative expectations in the social environment. Accordingly, the presented study analyzes primary school teachers' and teacher students' attitudes against several measures of differentiation with respect to the following questions:

1. How suitable do teachers assess these measures for gifted education?
2. Which amount of effort and time do teachers assess for adopting measures of internal differentiation in their classes?
3. How frequently do teachers adopt these measures in their classes?
4. Is there a correlation for certain measures between assessed eligibility, assessed effort, and frequency of adoption?

5. Are there differences between the attitudes of teachers and students with and without information on the topic of giftedness?

Method

Measuring Instrument and Participants

A sample of teachers and teacher students were interviewed with a questionnaire comprising amongst others three parts with questions (4-Step-Likert items) on the following aspects: 1. assessed eligibility, 2. assessed expenditure of work and time, and – only for teachers – 3. frequency of the usage of several methods of differentiation in their classes. The questionnaire also contained several questions concerning personal data and in addition to that a question on teachers' sources of information with respect to gifted education.

Item examples:

1. *How suitable do you assess the following measure for the promotion of gifted children?*
   Internal differentiation by variation of aspiration level:
   (1) not suitable (2) less suitable (3) suitable (4) very suitable
2. *How do you assess your personal effort of work and time to implement the following methods of promotion of gifted children in your classes?*
   Open learning:
   (1) low (2) still manageable (3) hardly manageable (4) too high
3. *How often do you use the following measures in your classes especially for gifted children?*
   Individual work schedule for every pupil:
   (1) never (2) sometimes (3) often (4) very often

134 questionnaires were distributed at 14 primary schools and 99 questionnaires were distributed in several advanced courses for teacher students at the University of Koblenz. The return rate for teachers was 48% (N = 60) and 78% for students (N = 77), which can be accepted as sufficient.

Data Analysis

In order to analyze the differences in the attitudes of the subgroups, 2 (teacher vs. student) x 2 (information vs. no information on giftedness) analyses of variance were conducted with item values on assessed consequences (eligibility for gifted education, work load) as dependent variables. For the subgroup of teachers Pearson correlation coefficients were calculated for each measure between the degree of assessed work load, the degree of assessed eligibility and the frequency of usage of methods of internal differentiation in their own classes.

Results

Sample

The final sample consisted of 137 subjects, N=52 teachers, N=77 teacher students, N=4 teachers on probation and N=4 supply teachers. As the subsamples of teachers on probation and supply teachers were very small, they were not incorporated as subgroups in the ANOVAS.

The mean age of the teachers was 41 years and the mean age of the students was 23 years. 91% of the subjects were female, which is consistent with the gender ratio in the total population of primary school teachers in Germany (Statistisches Bundesamt, 2010, p. 134).

79 subjects declared that they had been informed on the subject of giftedness and on gifted education (23 students and 56 teachers). Sources of information for teachers were continuing education for teachers (N=17), teacher training courses (N=20), and various other sources (N=45), like literature, media, etc. Sources of information for students were mainly university courses on the topic of giftedness.

Assessed Eligibility of Methods of Differentiation

Means of the assessed eligibility of methods of differentiation reveal that teachers, as well as students, estimate most of the listed methods as "suitable" to "very suitable" for the promotion of gifted children (table 1). Differentiation with respect to aspiration level was rated most suitable, followed by enquiry based learning, weekly schedules with additional tasks and individual weekly schedules, open learning, differentiation with respect to approaches to subjects, project work, free activity and resource rooms. Only internal differentiation with respect to handling time for tasks, amount of learning matters and the sharing circle were estimated between "less suitable" and "suitable".

Interestingly, from the listed methods of external differentiation only study groups for gifted students and pull-out programs were rated between "suitable" to "very suitable". Special parents' evenings and measures of acceleration – early school enrolment, grade skipping and grade telescoping, were estimated less favorably, between "less suitable" and "suitable".

Table 1. Assessed Eligibility of Methods of Differentiation

	N	*M*[1]	*SD*
Internal differentiation with respect to			
…handling time of tasks	133	2.62	.765
....amount of learning matters	133	2.85	.821
…aspiration level	136	3.77	.455
…approaches to subjects	132	3.36	.657
Open learning	131	3.50	.625
Weekly schedule with enrichment offers / special tasks	136	3.56	.568
Individual weekly schedules	133	3.56	.678
Free activity	134	3.15	.710
Project work	136	3.30	.648
Enquiry based learning	132	3.61	.519
Tutoring system / cooperation	135	3.08	.820
Sharing circle	119	2.10	.694
Resource rooms	127	3.09	.591
Study groups for gifted pupils (e.g. chess, creative writing, astronomy)	130	3.54	.573
Special parents' evenings (for parents of gifted children)	117	2.85	.847
"Discovery Day" (high achieving students gather and work together on one the day of the week)	119	3.33	.702
Pull-out-Programs (high achieving students gather and work together for a couple of hours)	118	3.16	.613
Early school enrolment	126	2.55	.733
Grade skipping	121	2.64	.644
Grade telescoping	128	2.88	.742

No differences between the subgroups of teachers and students or subjects with and without information on the topic of giftedness could be shown in the analyses of variance.

Assessed Effort of Work and Time for Measures of Internal Differentiation

There was not a single measure of differentiation where the necessary personal average effort of work and time to implement them in classes was assessed to be "hardly manageable" or "too high" (see table 2). Measures that were rated the most extensive, between "still manageable" and "hardly manageable", were individual weekly schedules, internal differentiation with respect to approaches to subjects, enquiry based learning and project work. Apparently, individual weekly schedules were the measure, which was estimated to be the most laborious. Internal differentiation with respect to handling time, tutoring system and sharing circle were rated to require rather low effort.

Table 2. Assessed Effort of Work and Time, ANOVA Results for Subgroups Teachers and Students, Subjects with and Without Information on Giftedness

	N	*M*[1]	*SD*	*F* occupational category	*F* status of information
Internal differentiation with respect to					
…handling time of tasks	133	1.48	.572	.051	.659
... amount of learning matters	130	1.85	.544	2.034	.525
…aspiration level	133	1.98	.522	.012	.010
…approaches to subjects	131	2.23	.615	.987	.262
Open learning	127	1.97	.603	.457	.049
Weekly schedule with enrichment offers / special tasks	135	1.93	.521	2.749	2.258
Individual weekly schedules	136	2.85	.739	3.582*	2.551
Free activity	134	1.84	.560	.306	.263
Project work	131	2.14	.565	4.743**	2.264
Enquiry based learning	130	2.15	.586	1.708	2.080
Tutoring system / cooperation	135	1.42	.553	.564	.092
Sharing circle	124	1.30	.598	.467	.012
Resource rooms	127	2.04	.635	.412	.010

Notes. [1](1) low (2) still manageable (3) hardly manageable (4) too high
*p<.10; **p<.05

With respect to individual weekly schedules there was a tendency (p=.06) for a significant difference between the ratings of students and teachers. Teachers estimated the effort for creating individual weekly schedules slightly higher (M=2.88; SD=.784) than students did (M=2.84; SD=.694). Furthermore, there was a significant interaction effect between occupational group and status of information on giftedness for this item (F (1,124)=6.989; p<.01). Teachers (M=2.84, SD=.766) and students with information (M=3.05; SD=.575) assessed the effort for this measure as hardly manageable, students without information between still manageable and hardly manageable (M=2.76; SD=.725), whilst teachers without information rated the effort for individual weekly schedules as too high (M=4, SD=0). As the group of teachers without information on giftedness consisted of only two subjects these results have to be interpreted with great caution.

For project work as a measure of furtherance there was a significant difference between the ratings of teachers and students. Teachers (M=2.04, SD=.577) rated the required effort lower than students (M=2.21, SD=.552; F (1,119) = 4.743) did. Again there was a significant interaction effect occupational group x status of information (F (1,119) = 4.371; p<.05). Students (M=2.09, SD=.515) and teachers (M=2.06; SD=.592) with information on giftedness assessed the required effort as still manageable, students without information (M=2.26, SD=.552) a little higher, whilst the two teachers without information rated time and effort for project work to be low (M=1, SD=0).

Frequency of Adoption of Measures for Promoting Gifted Students

At first, it has to be stated that only one of the measures was used "often" with respect to the frequency teachers adopted the listed measures in their classes. This was the use of tutoring systems or cooperation. Measures of internal differentiation with respect to handling time of tasks, amount of learning matters, aspiration level and free activity were used between "sometimes" and "often" with ratings nearer to the "often" tail, followed by open learning, sharing circle, weekly schedule with additional materials, enquiry based learning, project work, resource rooms and varying approaches to subjects with means above 2.0. Individual weekly schedules were the less frequently used method ("never" to "sometimes") (see table 3).

Table 3. Frequency of Adoption of Measures (Only for Teachers) and Pearson's Product Moment Correlation with Assessed Eligibility and Assessed Work Load

	N	*M*[1]	*SD*	Assessed eligibility (*p* 2-tailed)[2]	Assessed work load (*p* 2-tailed)[2]
Internal differentiation with respect to					
…handling time of tasks	59	2.81	.861	.363**	.137
... amount of learning matters	60	2.97	.758	.222	-.227
… aspiration level	60	2.82	.770	.099	-.214
… approaches to subjects	60	2.05	.622	.150	-.337*
Open learning	59	2.49	.796	.131	-.374**
Weekly schedule with enrichment offers / special tasks	60	2.40	1.012	.316*	-.360*
Individual weekly schedules	60	1.63	.882	.307*	-.499**
Free activity	58	2.52	.883	.381**	-.321*
Project work	60	2.10	.543	.233	-.214
Enquiry based learning	59	2.22	.696	.157	-.472**
Tutoring system / cooperation	59	3.00	.891	.324*	-.125
Sharing circle	51	2.45	1.119	.231	-.076
Resource Rooms	57	2.07	.678	.145	-.192

Notes. [1] (1) never (2) sometimes (3) often (4) very often
*p<.05, **p<.01, ***p<.001

Pearson correlations of the self-reported frequency of use and the assessed eligibility of the listed measures were altogether consistently positive. This means that an estimated high eligibility for the promotion of gifted children goes together with an increased frequency of use of the measure in instruction. Correlation coefficients were significant for differentiation with respect to handling time of tasks, weekly schedules with enrichment offers, individual weekly schedules, free activity and the use of a tutoring system.

Inversely, correlation coefficients between self-reported frequency of use and assessed work load for the measures were mostly negative (except for variation in handling time of tasks), indicating that an assessed high amount of work load for a measures goes together with a decline of frequency of adopting the measure in instruction. Significant coefficients were all negative and resulted for differentiation of approaches to subjects, open learning, weekly schedules with enrichment materials, individual weekly schedules, free activity and enquiry based learning.

Discussion

First of all, it can be stated that German primary school teachers' as well as teacher students' attitudes with respect to methods of internal differentiation, as far as their eligibility for the promotion of gifted children in instruction is concerned, seem to be consistently positive. Remarkably, this is especially true for challenging measures, where special materials have to be provided, like e.g. differentiation with respect to aspiration level, enquiry based learning, weekly schedules with additional tasks, individual weekly schedules, and so on. In contrast to studies revealing a general preference of teachers for measures of homogeneous grouping, the results of the presented study support the notion that teachers have a preference for measures which allow gifted children to remain in their age group for schooling. Especially measures of acceleration like early enrolment at school or grade skipping, were judged as less suitable for promoting gifted children (see also Heinbokel, 2008).

As far as the amount of anticipated effort of work and time is concerned, teachers judge measures of internal differentiation as "manageable", or even lower. Values for measures that require additional learning materials, such as individual weekly schedules, internal differentiation with respect to approaches to subjects, enquiry based learning and project work, were slightly higher. Individual weekly schedules were judged to be the most laborious method.

But in spite of their positive judgments with respect to eligibility of measures of internal differentiation for the instruction of gifted children and an only moderate amount of anticipated work load, teachers seem to adopt measures of differentiation rarely. Positive correlations of frequency of use with assessed eligibility in combination with negative correlations with assessed work load possibly reveal teachers' conflict between general knowledge on instructional methods and anticipated personal consequences of adopting them. Solzbacher (2006) assumes that teachers are simply unable to cope with heterogeneity in a school system, which is standardized in every respect, which would mean that the system hinders them to differentiate in general. The results of this study lead to the hypotheses that especially measures that require the provision of special learning materials and/or enhanced monitoring and structuring of children's individual activities like weekly schedules, enquiry based learning, and open learning or free activities seem to be afflicted in their use by anticipation of too much work.

There were only a few significant differences between teachers' and students' attitudes. Interestingly, teachers assessed the necessary work load for individual weekly schedules slightly

higher than students did. Students without information assessed project work to be more laborious than teachers and students with information on giftedness. But altogether the attitudes of primary school teachers and teacher students with respect to eligibility of measures and anticipated work load appeared to be very similar. Even the self-reported level of information on giftedness does not seem to make much difference at least for teacher students. A possible reason for the lacking effects of occupational experience or academic instruction and other resources of information on giftedness may be that these experiences do not provide teachers or students with information or skills on adopting methods of differentiation for gifted children.

The two teachers who rated themselves as not informed on giftedness were a rather special group and tended to give extremely deviating answers, e.g. that project work requires no effort at all for the teacher. Apparently, these two had some reservations against the topics of giftedness and internal differentiation and expressed their reservations by taking a somewhat extreme position.

Conclusion

In spite of their positive attitudes towards measures of internal differentiation as means of promoting gifted children at school, teachers as well as teacher students, see difficulties in adopting some very effective methods of differentiation. Information on the topic of giftedness in general does not seem to make a difference concerning this matter. Teachers apparently are in conflict between their knowledge of how instruction should be in the best case and anticipated work load. A very simple, but verisimilar explanation for this situation may be that they just do not know how to implement more challenging methods in their classes. Introducing only one single method of differentiation like e.g. providing above level-materials to advanced learners may require various further alterations in the classroom (Johnsen, Haensly, Ryser & Ford, 2002), a process that just may overstrain teachers who are not trained and supported to use methods of differentiation. Hence, it seems necessary to think about ways of supporting teachers in implementing these methods, e.g. by advanced training or provision of materials. Furthermore, methods of internal differentiation should already be imparted in teacher training at universities.

References

Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior.* Englewood Cliffs, NJ: Prentice-Hall.

Bönsch, M. (2004). Differenzierung in Schule und Unterricht. Ansprüche – Formen – Strategien [Differentiation in school and instruction]. W. H. Peterßen (Hrsg.). *EGS-Texte. Erziehung – Gesellschaft – Schule [EGS-texts. Education – society – school]*. München, Düsseldorf, Stuttgart: Oldenbourg.

Busse, S. (2007). *Integration von hochbegabten Schülerinnen und Schülern in Unterricht und Schulleben der Grundschule [Integration of intellectually gifted students in instruction and every day life of of primary schools].* Berlin: LIT.

Coleman, L. J., & Cross, T. L. (2005). *Being gifted in school*. Waco, Texas: Prufrock Press.

Endepohls-Ulpe, M. (2009). Teaching gifted and talented children. In L. J. Saha & A. G. Dworkin. *The new handbook of teachers and teaching. Volume II*, 861-875. New York: Springer.

Heinbokel, A. (2008). Enrichment or acceleration. In J. Raffan & J. Fôrtíkovâ (Eds). *From giftedness in childhood to successful intelligence in adulthood. Proceedings (Selected Research Papers) of the 11th Conference of European Council for High Ability. Prague* (81-88). The Centre of Giftedness.

Heller, K. A. (2005). Education and counselling of the gifted and talented in Germany. *International Journal for the Advancement of Counselling*, *27*(2), 191-210.

Heller, K. A., & Hany, E.A. (1996). Psychologische Modelle der Begabtenförderung. [Psychological models of fostering the gifted]. In F.E. Weinert (Hrsg.), *Enzyklopädie der Psychologe, Psychologie des Lernens und der Instruktion, Pädagogische Psychologie*, *Bd. 2*, 477-503, Göttingen: Hogrefe.

Hertzog, N. B. (1998). Open ended activities: Differentiation through learner responses. *Gifted Child Quarterly*, *42*(4), 212-227.

Johnsen, S. K., Haensly, P. A., Ryser, G. R., & Ford, R. F. (2002). Changing general education classroom practices to adapt for gifted students. *Gifted Child Quarterly*, *46*(1), 45-63.

Kaplan, S. (2003). Is there a gifted-child-pedagogy? *Roeper Review*, *24*(4), 165.

Kulik, J. A., & Kulik, C.-L.C. (1992). Meta-analytic findings on grouping programs. *Gifted Child Quarterly*, *36*(2), 73-77.

Ladenthin, V. (2006). Brauchen Hochbegabte eine eigene Didaktik [Do gifted children need a special didactics]? In C. Fischer & H. Ludwig (Hrsg.), *Begabtenförderung als Aufgabe und Herausforderung für die Pädagogik. Münstersche Gespräche zur Pädagogik (Promotion of the gifted as a task and challenge for pedagogy], Heft 22,* (46-65). Münster: Aschendorff Verlag.

Montgomery, D. (1994). The promotion of high ability and talent through education and instruction. In K. A. Heller & E. A. Hany (Eds.), *Competence and Responsibility. The third European conference of the European council for high ability held in Munich (Germany)*, Oct. 11-14, 1992. *Vol. 2*, Proceedings of the Conference, 319-335.

Olszewski-Kubilius, P. (2003). Gifted education programs and procedures. In W. M. Reynolds & I. B. Weiner (Eds.), *Handbook of Psychology, Vol7, Educational Psychology*, Hoboken: John Wiley & Sons, pp.487-510.

Paradies, L., & Linser, H. J. (2009). *Differenzieren im Unterricht [Differentiation in instruction]*. (4. Auflage). Berlin: Cornelsen.

Reketat, H. (2001). *Offener Unterricht – Eine Fördermöglichkeit für hoch begabte Kinder in Regelschulen [Open Learning – A way of promoting gifted children in regular classes]!?* Erziehungswissenschaft. Bd. 49. Münster: LIT.

Rindermann, H., & Heller, K.A. (2005). The benefit of gifted classes and talent schools for developing students'competences and enhancing academic self-concept. *German Journal of Educational Psychology, 19*, 133-136.

Rost, D. H., & Hanses, P. (1994). Besonders begabt: Besonders glücklich, besonders zufrieden? Zum Selbstkonzept hoch- und durchschnittlich begabter Kinder. [Extraordinary gifted: Extraordinary happy, extraordinary content? On the self-concept of intellectually gifted children and children of average intelligence.] *Zeitschrift für Psychologie, 105,* 379-4033.

Schulte zu Berge, S. (2005). *Hochbegabte Kinder in der Grundschule. Erkennen – Verstehen – Im Unterricht berücksichtigen [Gifted children in primary school. Discovering – understanding – considering in instruction].* Münster: LIT.

Solzbacher, C. (2006). Begabtenförderung durch Schulentwicklung und Netzwerkbildung [Promotion of gifted children by school deveopment and networking]. In C. Fischer & H. Ludwig (Hrsg.), *Begabtenförderung als Aufgabe und Herausforderung für die Pädagogik. Münstersche Gespräche zur Pädagogik (Promotion oft the gifted as a task and challenge for pedagogy], Heft 22,* (77-98). Münster: Aschendorff Verlag.

Statistisches Bundesamt [Federal Statistical Office]. (Hrsg.). (2010). *Statistisches Jahrbuch [Statistical Year book] 2010.* Wiesbaden. http://www.destatis.de/jetspeed/portal/cms/Sites/destatis/SharedContent/Oeffentlich/B3/Publikation/Jahrbuch/StatistischesJahrbuch,property=file.pdf (access 30.08.2011)

Tomlinson, C.A. (1996). Does gifted education have an instructional identity? *Journal for the Education of the Gifted*, *20*(2), 155-174.

Vock, M., Preckel, F., & Holling, H. (2007). *Förderung Hochbegabter in der Schule. Evaluationsbefunde und Wirksamkeit von Maßnahmen. [Promotion of gifted children at school. Results of evaluations studies and efficacy of measures].* Göttingen: Hogrefe.