

THE CHALLENGE OF EXCELLENCE:

'A VISION SPLENDID'

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Edited By:
Stan Bailey
Eddie Braggett
Maureen Robinson

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HOW TEACHERS FIND THEIR GIFTED STUDENTS FOR ENRICHMENT COURSES -- DESCRIBING, EXPLAINING, AND IMPROVING THEIR SELECTION STRATEGIES

Ernst A. Hany and Kurt A. Heller
Federal Republic of Germany

In many countries, the participants of enrichment courses for gifted children are selected on the basis of numerous data. Information from intelligence and creativity tests, teacher recommendations, scholastic achievement, self and peer nomination, and other data are combined into the decision as to whether the girl or boy should be allowed to attend the enrichment program. In European countries, psychological tests are not very popular in schools, and school administrations rely more on teachers' judgements than on test scores when making a school career decision. However, the validity and reliability of teacher judgements have been questioned by psychologists since the early work of Pagnato and Birch who showed the minimal effectiveness and efficiency of the teachers' ability to recognise test intelligence.

Studies of this kind can be criticised because apples are compared with oranges. Teachers judge the whole person and their many-faceted giftedness while tests can measure only partial aspects of a person. Therefore, teacher judgements should be evaluated against criteria which are as complex as their own assumptions. In our study, we try to evaluate teacher behaviour when selecting gifted students primarily in comparison to their own standards. First, we construct a model of the decision-making behaviour of teachers and then we control whether the steps of the model (the phases of the selection behaviour) are interrelated in a reliable, reasonable manner. In this way, we can observe if the internal logic of the teacher behaviour is correct and where the sensible points for necessary improvements are. We try not to condemn but to improve the teachers' selection behaviour.

State-wide Evaluation Program in Baden-Wurtemberg

Since 1984 there have been instructional courses available for particularly talented students in Baden-Wurtemberg (one of the eleven federal states of West Germany). These instructional courses are called "Work groups for particularly talented students" and are a supplement to the regular program of instruction at school. In 1984, the Baden-Wurtemberg government chose 70 schools in which instructional courses for gifted students could be arranged. Since then, the number of schools has increased substantially. For the forthcoming academic year several hundred schools will be involved.

The participating teachers can choose a course topic which does not belong to the regular curriculum. They can freely and without the use of tests determine which students may be allowed to participate. In some schools the teachers carefully select the course participants; in other schools they heavily rely on self-nomination by students. The government recommends that the participants should be particularly gifted, have demonstrated good academic performance, have a strong interest in the course topic, and be capable of carrying the work load.

The students usually meet once a week for approximately two hours in addition to their regular daily instruction. The courses generally last one full school year, and they do not result in the participants completing school sooner than other students. The courses are considered to be enrichment and not acceleration programs.

This support program of Baden-Wurtemberg is of special significance in Germany. The school system in our country shows a wide variety and does justice to

many different types of giftedness. For that reason, many people do not consider special programs for gifted students to be necessary. However, in the last years, several states have started special programs, and at present Baden-Wurtemberg plays a leading role.

The General Identification Model

The ideal teacher who wants to offer an enrichment course first collects sufficient and valid information about possible participants (see Figure 1). Then he or she makes a diagnostic evaluation about the actual achievement behaviour, the abilities and aptitudes, the motivation, work habits, and so on. As a next step, the teacher compares

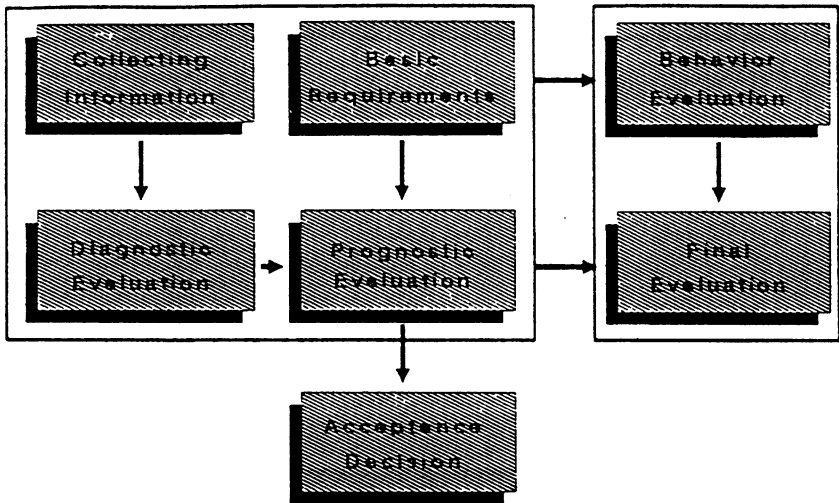


Figure 1 *Model for the selection of gifted students by teachers*

these student characteristics with the demands of the planned enrichment program. Of course, every teacher has some desires about the ideal participant but there are also some basic requirements that every participant should meet. The comparison of the basic demands of the program and the cognitive endowment of the student leads to the prognostic evaluation. That means that the teacher tries to imagine whether the possible participants would be successful when attending the course. The prognosis may be somewhat uncertain when the teacher has not sufficient information at hand -- but we assume that the ideal teacher has collected enough data. The final placement decision then could be evaluated by the teachers' own satisfaction with the chosen participants. We assume that the teachers observe their students and evaluate their behaviour during the course. At the end of the course, they come to a final evaluation about the abilities and achievement behaviour of the students and about their general qualification for the enrichment program. If the teachers are able to select the participants in a valid way, they should be totally satisfied with the students. If not, perhaps the acceptance decision could be improved. A decision-making strategy should

be constructed that allows the teacher to identify the unsuccessful students at the beginning of the course.

Evaluating the Model Stages

The Teachers' Information Collecting Behaviour: We asked approximately 30 teachers who offered an enrichment course what information they collected about their participants. We did not give them a list of student characteristics but asked them to freely write down the collected information. After that, we classified the answers into discrete categories and calculated to which extent the particular information was collected. Table 1 shows the results. First, we observe that more than one piece of information is collected from every student because the percentages add up to more than 1. Second, we see that an undifferentiated general qualification judgement (cf. the end of Table 1) is one of the main pieces of information. However, in many other cases, the teachers could describe to what particular characteristics they refer. The teachers mostly collect information about interests, especially in the school subject that has the closest connection to the content of the enrichment course, and then information about giftedness, abilities, and scholastic achievements. At least one category is missing, namely creativity. Creativity, as we will also see later, is no independent concept in the teachers' cognition.

Kind of Information	Percentage
Interest in work group topic	.48
Interest in related subject	.60
Interest in broader domain	.05
Achievement in earlier work group	.15
Achievement in related subjects	.36
General school achievement	.13
Giftedness in work group domain	.39
General giftedness	.12
Cognitive abilities	.33
Commitment, motivation	.27
Prior knowledge	.11
Stress resistance	.27
Work habits and skills	.14
Co-operation	.09
General qualification	.50
Number of Valid Observations	= 300.00

Table 1 Percentages of information collected by the teachers for every participant

Source of Information	Percentage
Subject-specific teacher	.50
Other teachers/director	.20
Own classroom experience	.45
Talk/interrogation	.57
Self-nomination	.20
Certificate/school grades	.23
Private relationships	.03

Table 2 Percentages of sources of information used by the teachers when judging the course qualification of the students

Table 2 shows the distribution of the sources of information that the teachers used to gather the above mentioned data. In many cases, the teachers had a special talk with the student about his/her motives and interests as to why he/she would attend the enrichment course. Recommendations from the English, Mathematics, Physics and other teachers -- depending on the topic of the enrichment course -- and their own classroom experience also belong to the main sources of information. Generally speaking, the teachers apply a rational behaviour when collecting information.

Diagnostic Evaluation of the Students: After collecting much information, the teacher should be able to judge the students in several achievement-related characteristics. We now compare the teachers' judgements with other information. This is done because one could suspect that teachers rely mainly on school grades and not on abilities.

In Table 3, the correlations between the most important dimensions of evaluation and some significant school grades are reported. Contrary to the suspicion, the teachers refer their judgement to the school grades only to a small amount. The particular reference is even acceptable because it happens when judging achievement and cognitive abilities. In most of our tables the significance level is 1%.

Diagnostic Evaluation by the Teacher					
School Grades	Interest in work group topic	Achievement in related subject	Cognitive abilities	Commitment, motivation	Co-operation
German	.01	.25 *	.14	.04	.05
Mathematics	--.12	.25 *	.35 *	.19	.07
Physics	--.09	.08	.30 *	.15	.21
Biology	.00	.19	.15	.12	.26
History	.01	.22 *	.17	.08	--.18

1-tailed Significance: * $p < .01$

Table 3 *Correlations between the school grades and the diagnostic evaluation by the teacher*

Next, the teacher judgements should be compared to intelligence test scores. We applied the German form of the Cognitive Abilities Test and received the results reported in Table 4. The judgements of achievement and giftedness are highly correlated with the intelligence scores. There are no relationships with interest, commitment or co-operation. The relationships with the judgement about the cognitive abilities are also weak, indicating that the teacher does not have a very precise concept of abilities but he or she has a practical concept of giftedness at his/her disposal and is able to extract cues of giftedness from the achievement behaviour. On the other hand, teachers are not successful in using creativity as an indicator of giftedness. Table 5 shows that there are no significant positive correlations between the teacher judgements and creativity scores. On the contrary, there are strong negative correlations between verbal creativity and commitment. It could be that teachers interpret verbal fluency and time-consuming verbal statements of their creative students as signs of missing task-related behaviour and missing motivation.

Diagnostic Evaluation

Scales of CAT	Interest in work group topic	Achievement in related subject	Giftedness	Cognitive abilities	Commitment, motivation	Co-operation
Verbal Comprehension	-- .03	.31 *	.33 *	.12	.16	-- .02
Verbal Thinking	-- .09	.24 *	.25 *	.00	-- .13	-- .18
Arithmetic Thinking	.05	.27 *	.18 *	.18	.09	.16
Calculating Abilities	.09	.33 *	.41 *	.11	.07	.20
Nonverbal Thinking	.02	.19	.23 *	.21	.04	.10
Constructive Abilities	.12	.08	.20	.14	.17	.28
Total Score	.01	.42 *	.40 *	.23 *	.10	.05

1-tailed Significance: * $p < .01$

Table 4 Correlations between the diagnostic evaluation and the indicators of intelligence

Diagnostic Evaluation	Verbal Creativity		Practical Creativity	
	Productivity	Flexibility	Productivity	Flexibility
Interest in work group topic	.22	.20	-- .25	-- .27
Achievement in related subject	.37	.38	.28	.24
General giftedness	.07	.01	-- .14	-- .08
Cognitive abilities	-- .25	-- .35	-- .09	-- .13
Commitment, motivation	-- .70	-- .69	-- .16	-- .39

Table 5 Correlations between indicators of creativity and the diagnostic evaluation

Basic Demands of Course Participation: We have found that German teachers are able to build valid judgements of their students with the exception of creativity. We are now looking to the basic requirements that the teachers set for the course participants. We gave the teachers a list of 19 statements and asked them to indicate the level of requirements for the ideal participant and the level for the basic requirements, i.e. the necessary level that serves as a cut-off point for the course admission. In Table 6, we have rank-ordered the 19 statements according to the basic requirements level (in the third column).

	IDEAL	BASIC	Sig.
shows lively interest in work group topics	1.61	2.70	*
works thoroughly	1.39	2.74	*
comprehends new material quickly	1.87	2.96	*
is of high intelligence	2.04	2.96	*
completes work carefully and diligently	1.87	3.00	*
can work with concentration	1.87	3.04	*
works and learns independently	1.70	3.17	*
is co-operative and likes team work	2.35	3.22	*
has very good marks in related subjects	2.74	3.30	*
is skilful in conducting manual work	2.13	3.48	*
is critical; notes contradictions	2.00	3.70	*
is generally active and lively	2.13	3.70	*
works a lot for the work group (at home)	3.04	3.78	*
shows well developed school performance	3.30	3.83	*
has original ideas	3.22	4.00	*
is in control and well balanced	3.48	4.09	*
is eloquent	3.44	4.22	*
is self confident, has high self-esteem	3.30	4.30	*
has good prior knowledge of the WG topic	3.44	4.39	*

(The rating scales had a range from 1 = high to 6 = low;
WG = work group; low scores mean high demands; $p < .01$)

Table 6 *Scores for the ideal work group participant (IDEAL) and the basic (minimum) requirements to the participants (BASIC)*

We see that the teachers place high value on interest, cognitive skills, and work habits. This indicates that the teachers want to have the successful and "easy to handle" students in their courses. Critical thinking and having original ideas -- signs of creativity -- are not ranked highly. The teachers also do not expect deep knowledge of the topics in the work groups. This could be a typical effect of enrichment courses. The lessons should not go into deep details because in this way the students would get an advantage for the regular curriculum. Therefore, the themes of the enrichment courses must lie outside of the school curriculum, and teachers can not expect high expertise from the participants. On the other hand, you can not expect to reach a high course level when students are totally unfamiliar with the new knowledge domain.

When comprehending the information in Table 6, we can build five sum scales of the most important items. Figure 2 shows the relevance of the domains for the teachers. The participants should meet high criteria for work habits and low criteria for knowledge. Generally, teachers emphasise student characteristics that are necessary to work successfully in a team and to reach the goals that the teacher has set for the work group.

Prognostic Evaluation of the Students: The next step of our evaluation is to examine in which way the diagnostic information and the basic requirements are combined into predictions about the students' behaviour and success in the work group. We expect positive correlations between the diagnostic and the prognostic judgements but negative correlations between the basic requirements and the predictions. The higher the teacher's demands for successful performance in the work group are, the lower should the success expectations for the students be.

Table 7 displays the correlations between diagnostic and prognostic evaluations. We asked the teachers to judge the expected behaviour of the students in the domains achievement, commitment, creativity, interest in the topic, and co-operation with the group. We can see that the prediction of achievement in the enrichment course is based on the evaluation of general scholastic achievement and giftedness. The judgement of commitment is based on the interest in the course-related school subject and on work habits. The creativity prognosis relies on interest and giftedness. The interest prognosis itself is made on the basis of achievements in earlier enrichment courses and at school generally. High co-operation is predicted when high stress resistance is judged.

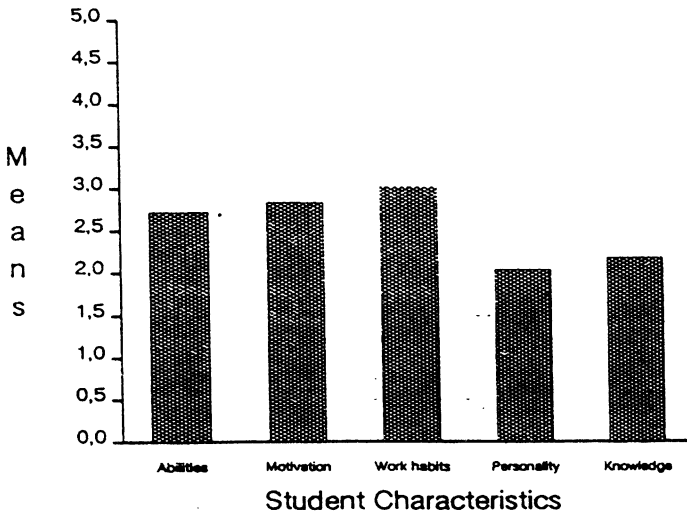


Figure 2 *Relevance of student characteristics for the teachers (basic requirements)*

We recognise that the correlations show a rational procedure for the behaviour prediction of the teachers. One might wonder why some correlations are low where they should be high; for example, the correlations between judging and predicting commitment or interest in the work group. Please note that no single teacher has judged all of the student characteristics mentioned. The characteristics listed in Table 7 have been used by different portions of the teachers, and this fact could lead to some unexpected results.

We will now look at the correlations between predictions and basic requirements. We expected negative correlations but found no significant correlations at all (Table 8). That means that teachers postulate basic demands but do not use them in selecting their course participants. This may be due to restrictions at some schools. If only five students want to attend the enrichment program offered, one can not reject some candidates because then the course could not take place. In this case, the teacher sometimes must accept candidates that do not meet the basic criteria. If the teacher decides not to implement the enrichment course, the really gifted students would be disadvantaged in comparison to other schools.

Diagnostic Evaluation	Prognostic Evaluation				
	Achievement	Commitment	Creativity	Interest	Co-operation
Interest in work group topic	.18	.17	.23*	-.04	.18
Interest in related subject	.56*	.52*	.50*	.34*	.32*
Achievement in earlier work group	.34	.32	.42	.48*	.15
Achievement in related subject	.42*	.08	.34*	-.19	.13
General school achievement	.71*	.45*	.33	.49*	.29
Giftedness in work group domain	.59*	.43*	.33	.49*	.29
General giftedness	.19	-.27	.15	-.15	.05
Cognitive abilities	.57*	.38*	.48*	.18	.04
Commitment, motivation	-.03	.06	-.24	-.02	.22
Prior knowledge	.27	.22	.25	-.16	-.16
Stress resistance	.05	.19	.17	.05	.47*
Work habits and skills	.34	.52*	.24	.30	.39
Co-operation	.21	.30	-.07	-.06	.55
General qualification	.36*	.29*	.39*	.28*	.18

Table 7 *Correlations between diagnostic and prognostic evaluation by the teachers*

Basic demands	Prognostic Evaluation				
	Achievement	Commitment	Creativity	Interest	Co-operation
Giftedness	.10	.13	.05	-.06	.12
Motivation	-.01	.03	-.09	.11	.03
Work habits	.02	.12	0.02	.07	.20
Personality	.04	.11	-.04	.01	.34
Prior knowledge	.03	.00	-.13	-.05	.10

N of cases: 190

1-tailed signif:

* $p < .01$

Table 8 *Correlations between basic requirements and the dimensions of the prognostic evaluation*

Two other aspects of the prognostic evaluation shall be examined here. They refer to the certainty or uncertainty of the prediction. The teachers should be aware of the uncertainty of their opinions if they have only a small information base. Table 9 shows that the more student characteristics the teachers use, the less uncertain they are in their predictions. We also see that the number of sources of information considered does not influence the certainty of judgement.

Uncertainty	Number of available sources	
	information	
	-.0525	-.3180 *

N of cases: 221

1-tailed signif:

* $p < .01$

Table 9 *Correlations between the extent of available information and the self-reported uncertainty of the predictions*

The second question is whether the certainty of prediction is influenced by the kind of information or sources available. We expect that teachers have more trust in their own experience with the students than in information provided by colleagues. Figure 3 shows the degree of certainty on the basis of the main information at hand. We can see

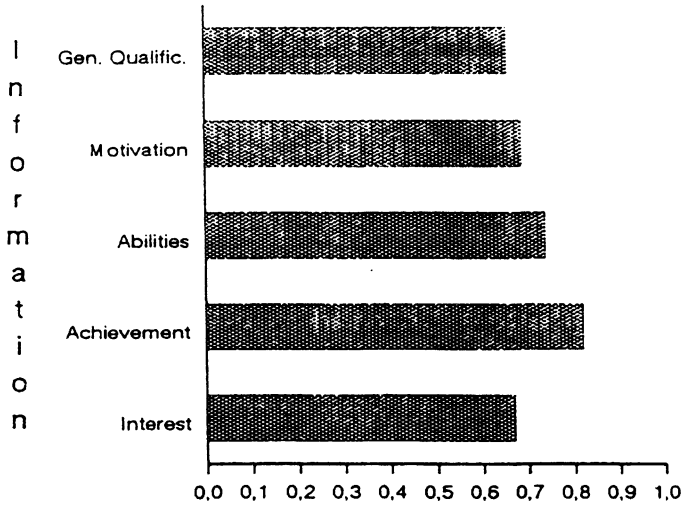


Figure 3 Subjective probability of prediction depending on main type of information

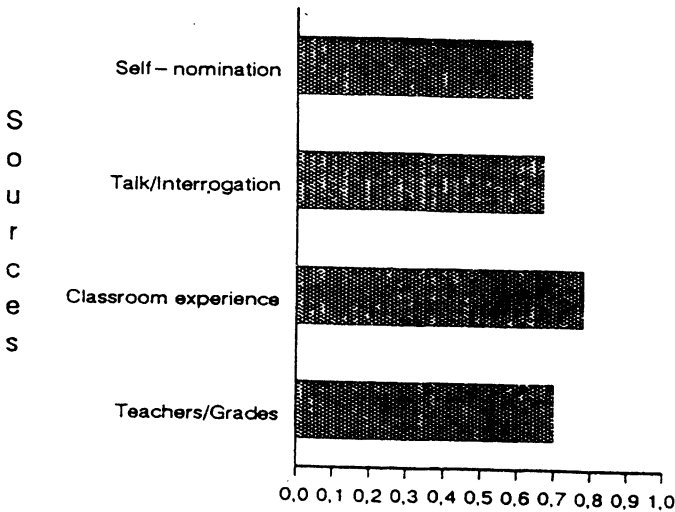


Figure 4 Subjective probability of prediction depending on main information sources

that the teachers are rather sure in their evaluations if they have achievement information available. The least valuable information for a certain decision is the general qualification judgement. The differences between the five kinds of information are highly significant. This also holds true for the differences of certainty on the basis of the source of information. Figure 4 shows the degree of certainty depending on the different main sources. The own classroom experience seems to be the most reliable while self-nomination is the least. These results again show the reasonable judgement behaviour of the teachers.

Acceptance Decision of the Teachers: At this point, we have taken a closer look at the cognitive processes that lead to the decision as to whether a student may enter the enrichment course or not. Unfortunately, we have no immediate information about the decision-making process itself. We had asked the teachers to give us information not only about their course participants but also about the rejected students, but only a few teachers did so. Thus, we were not able to reconstruct the real decision-making process from our data. This deficiency is however not very important. We know that the teachers do make a decision and we have the basic information at hand. This information is sufficient to improve the teachers' decision-making behaviour if necessary. Therefore, we will now turn to the question as to whether the teachers' decisions have to be improved or not.

Behaviour Evaluation of the Participants: First, we will consider the students' behaviour evaluations by the teachers in comparison to the basic requirements at the beginning of the course. We see that the students -- on the average -- fulfil the basic requirements (Figure 5). The attributes of the students are more favourable than necessary for just being admitted to the course. The calculated difference scores have the highest values in those domains where the basic demands are lowest. Generally speaking, the students meet the demands place on them by the teachers.

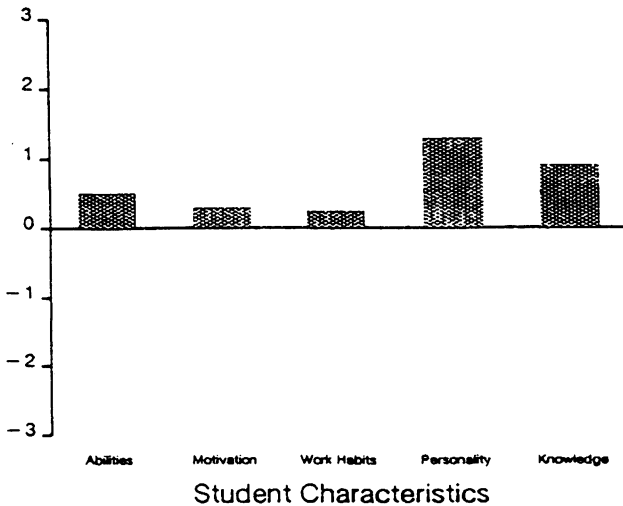


Figure 5 *Behaviour evaluation of participants differing from basic requirements*

Final Evaluation of the Students' Success: When we now look at the final evaluation of the students, we find high correlations with the behaviour evaluations. Table 10 shows many significant positive correlations. In this way, the reliability but also the lacking differentiation of the teacher judgement is once more confirmed.

Final Evaluation	Behaviour Evaluation				
	Giftedness	Motivation	Work habits	Personality	Prior knowledge
Aptitude	.63	.45 *	.48 *	.49 *	.50 *
Learning Progress	.50 *	.54 *	.60 *	.55 *	.41 *
Achievement	.50 *	.43 *	.47 *	.43 *	.43 *
Interest	.39 *	.52 *	.53 *	.55 *	.34 *
Creativity	.63 *	.49 *	.53 *	.54 *	.49 *
Commitment	.44 *	.55 *	.54 *	.45 *	.39 *
Co-operation	.09	.23 *	.20	.14	.04
General Success	.30 *	.29 *	.43 *	.26 *	.08

N of cases: 107 1-tailed signif: * p < .01

Table 10 *Correlations between the behaviour evaluation and the final evaluation by the teachers' work*

Final Evaluation	Prognostic Evaluation				
	Achievement	Commitment	Creativity	Interest	Co-operation
Aptitude	.59 *	.43 *	.53 *	.18	.25 *
Learning Progress	.48 *	.37 *	.47 *	.22 *	.21 *
Achievement	.56 *	.50 *	.48 *	.25 *	.30 *
Interest	.42 *	.38 *	.40 *	.12	.39 *
Creativity	.53 *	.40 *	.47 *	.19	.16
Commitment	.50 *	.49 *	.36 *	.31 *	.31 *
Co-operation	.31 *	.39 *	.24 *	.27 *	.29 *
General Success	.21 *	.08	.18	-.12	.16

N of cases: 133 1-tailed signif: * p < .01

Table 11 *Correlations between the teachers' prognostic and final evaluations*

The same pattern of undifferentiated high correlations can be found by looking at the relationships between the prognostic evaluation at the beginning of the course and the final evaluations at the end of the course (Table 11). From the five prognostic scores, only the prediction of interest is not so important for the final evaluation. The other values show that either the teacher is highly capable of predicting the students' behaviour or the teacher is incredibly rigid and judges the students on the basis of his/her former opinions without noticing differences from his/her expectations. However, we have some other indicators that confirm the teachers' ability to correctly judge their students' capabilities and achievement potential in the scholastic environment.

Problems of the Teachers' Placement Decision: Despite the possibilities of predicting the future behaviour of their students, the teachers are not satisfied with the behaviour of all the students. There is a certain percentage of students who failed in the work group (Figure 6). The criterion for failure is determined by the teachers themselves. We asked them to indicate whether they would allow the students to attend the enrichment course once more if they were in the same position as one year before at the beginning of the work group. The teachers judged 14 percent of the participants as not really apt for the work group.

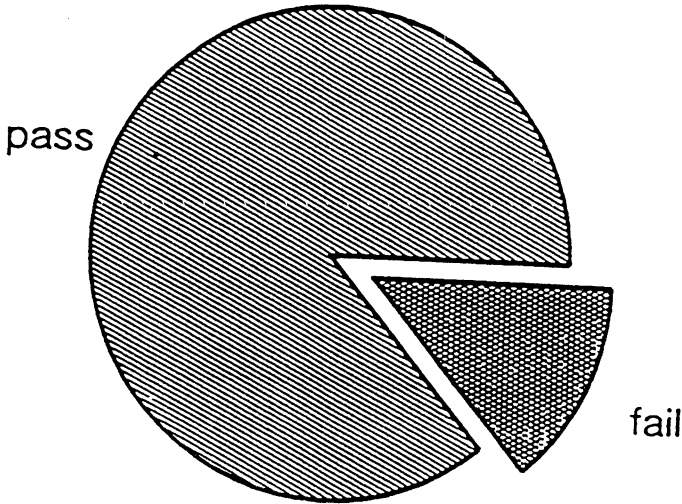


Figure 6 *Success in the work group (final evaluation by the teachers)*

In this phase of our study, we tried to explain why the teachers are able to predict student behaviour but also include unable participants in their course. We found the following explanation: nearly all unsuccessful students stem from the portion of the participants of whom the teachers were quite uncertain about their prediction. Table 12 shows that if one divides the students into two groups with a sure prognosis and a rather unsure judgement, nearly all unsuccessful students fall into the "unsure" category.

Let us take a closer look at the certainty of judgement. The teachers made five prognostic statements about the students and also indicated their certainty for each of the five domains. Table 13 shows the certainty scores for the successful and unsuccessful groups of students for each of the five predictions. We can see that the predictions regarding achievement, commitment and creativity were more unsure for the unsuccessful students at the end of the course.

Prognosis	Final Evaluation	
	Success	No success
Sure	4 8	1
Unsure	6 6	1 5

Table 12 Crosstabulation of the students regarding the certainty of the prognostic evaluation and the hardest score of the final evaluation (acceptance once more)

Certainty	Final Evaluation		Sig.
	Success	No success	
Achievement	2.77	2.30	*
Commitment	2.90	2.60	*
Creativity	2.66	2.20	*
Interest	2.96	2.75	
Co-operation	2.76	2.45	()

Significance: * $p < .01$ () $p < .05$

Table 13 Mean differences in the certainty scores for the five behaviour domains between the successful and the unsuccessful course participants

Information	"Sure" Students	"Unsure" Students	Sig.
Interest in work group topic	.62	.71	
Interest in related subject	1.36	1.03	
Achievement in earlier work group	.23	.08	*
Achievement in related subject	.53	.57	
General school achievement	.32	.04	*
Giftedness in work group domain	.22	.11	
General giftedness	.51	.26	*
Cognitive abilities	.46	.19	*
Commitment, motivation	.15	.15	
Prior knowledge	.36	.17	

Sources of information

Subject-specific teacher	2.08	1.58	
Other teachers/director	.74	.21	*
Own classroom experience	2.43	1.47	*
Self-nomination	.09	.42	*
Certification/school grades	.42	.42	

Table 14 Average amount of information about each student related to the degree of evaluation certainty

We conclude:

1. The teachers are able to predict the future behaviour in the work group if they have sufficient information. In this case, they can make a decision and reject unable students. For this reason, we find only successful students in the group of students with sure predictions.
2. The teachers are very uncertain about some students. In this case, they cannot make a decision. It seems that the teachers tend to admit all students with an unclear prognosis. In this case, the probability of admitting unable students increases.

To support this conclusion, we can demonstrate that the information available for the two groups of "sure" and "unsure" students differs significantly in some cases. Table 14 indicates that the teachers have less information about achievement and cognitive abilities for the unsure students than for the students with a sure prognosis. The unsure students are also distinguished by a lack of classroom experience and teacher recommendation, and by a larger portion of self-nomination.

Consequences of the Empirical Results

The consequences we draw from the reported results are simple and clear: if one wants to help teachers to find capable and successful students for enrichment courses, one should not condemn the teachers as unable to come to valid decisions. One should help the teachers collect valid information using reliable sources. Of course, the teachers could be trained to use test scores as valid information. It is however more important to support the teachers in the process of making their own decisions with the available information than to provide new information.

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