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Schulte, Barbara

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INSTRUCTIONAL TIME

TEACHING SUBJECTS AND TIME ALLOCATION IN THE GERMAN SCHOOL SYSTEM (BERLIN)

Barbara Schulte

This article presents an overview of teaching subjects and time allocation in the German school system, with a particular focus on Berlin. An analysis of existing documents and guidelines will be combined with interviews conducted in the last part of 2002 with the Berlin school administration and with headmasters and teachers at different schools. This will be followed by a discussion of some on-going developments relating to the organization of school subjects.

Particularities of the school system in Berlin

Politically and legally, Berlin possesses the status of a *Land*, i.e. one of Germany's sixteen states. This means that it has its own Ministry of Education, which, together with the other fifteen states, is co-ordinated by the Conference of Ministers of Cultural Affairs (*Kultusministerkonferenz*, KMK), a central organ developing voluntary standards and guidelines for the various school types and for the mutual recognition of school completion qualifications. At the same time, Berlin is both Germany's capital and its largest city. Its educational supply and demand, consequently, are marked by the characteristics of a big city, hosting a diversity of institutions to suit a plurality of its population's educational needs. In recent decades, Berlin's schools have provided education for many children of non-German origin – sometimes constituting more than 70% within a given

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Barbara Schulte (Germany)
Assistant Lecturer at the Comparative Education Centre, Humboldt University, Berlin. Her current research focuses on a comparative study of Chinese and Argentinian vocational education. She has published several articles on academic discourse formation and the conceptual background of vocational education in China. E-mail: Barbara.Schulte@rz.hu-berlin.de.

school (the average percentage being 20%) – and it still faces problems resulting from the reunification of East and West Germany.

In principle, German and mathematics, as well as vocational education (*Arbeitslehre*) at lower-track secondary schools, have always enjoyed high priority in Berlin. In addition to religious education, which in contrast to most German states is administered by the respective religious communities and not by the state, there is a pilot subject called ethics/philosophy offering a more pluralistic approach towards religious belief systems and philosophical thought. There are a variety of projects aimed at improving instruction and learning outcomes. Until recently, all these innovative approaches had been subject to the schools' or even individual teacher's enthusiasm. Consequently, schools in Berlin reveal huge differences in profile and scope of action. Moreover, many reforms at the local level depend heavily on the possibility of state funding, leading to a wide gap between wishful thinking and *status quo*. Recently, Berlin's school administration has started to reduce this arbitrariness by shifting more responsibility onto the schools, obliging them to develop both school programmes and school profiles (see below). This measure is part of the new law of education for Berlin, which was implemented in February 2004.[1] At the same time, new legal possibilities of evaluation of school and student assessment will certainly lead to more comparability between the different schools.

Teaching subjects and time allocation across schools and grades

Generally, Berlin's new law of education describes the foremost aim of education as the development of the individual student.[2] Crucial elements of each student's individual development are independent thinking, a sense of responsibility and tolerance, all oriented towards the values of human rights, the German constitution, and towards a free and democratic Europe. Despite this claim for an all-round education, in the eyes of many teachers school subjects display a hidden hierarchy in importance, consisting of mathematics, German and social studies, followed by the natural sciences (chemistry, biology and physics) and foreign languages. This hierarchy is also reflected in the schools' timetables, although in most recent educational and public discourse the natural sciences are gaining in importance, which will surely lead to a rearrangement of timetables in the near future (Interviews 1 and 3).[3]

CURRICULUM GUIDELINES

Due to Germany's specific, federalist educational structure, there is no national curriculum. The Ministry of Cultural Affairs of each state passes down curriculum guidelines, so-called *Rahmenpläne* (or in some states the more specific teaching plans – *Lehrpläne*). They are influenced by various factors, such as traditions and cultural heritage, educational concepts, expectations about the future, ideas about socialization, etc. (Hopmann & Künzli, 1998, p. 17ff.). Within the German three-tiered school system, these guidelines vary depending on the school type concerned, in most states consisting of the

Hauptschule (lower-track secondary school with a strong vocational focus, ending after Grades 9 or 10), the *Realschule* (middle-track secondary school offering liberal and vocational education, ending after Grade 10), and the *Gymnasium* (upper-track secondary school preparing for university, ending after Grade 12 or 13).[4]

Much time and money are spent on preparing the guidelines, and they are constantly being revised, with changes occurring almost every year. Sometimes a new guideline is developed even before the old one has been implemented. However, the frequency of new guidelines is very different, depending on how much the respective subject is influenced by on-going developments. For instance, while some guidelines remain in use for more than twenty years, others are thoroughly revised every six to eight years. The revision process usually requires three years in Berlin, although the new guidelines for primary school are expected to be finished within two years (Interview 1).

Little is known so far about the development processes of guidelines and about their actual impact on teaching and learning (Künzli, 1998), and participatory elements in curriculum production are still minimal. This deficit has led the Berlin school administration to significantly restructure curriculum development processes. At the present time, a general commission, consisting of around twelve to fourteen curriculum experts, defines long-term aims and priorities, complemented by a small group of two or three experts for each subject, who invite persons from other realms of society outside the school administration – university, schools, economy, etc. – to work out a subject-specific curriculum. Their working results are checked by the commission to ensure a sufficient degree of coherence between the various subjects. The school administration is also beginning to realise that curriculum guidelines do not necessarily produce and control instruction as intended. It is planned to investigate and evaluate the difference between input and output on a more regular basis (Interview 1).

Teachers are permitted to revise and supplement the curricular content according to their students' specific needs. This means that, while there are educational aims to be achieved, teachers are also relatively free to decide how much time will be spent on a specific topic. In the future, the school administration intends to continue this curricular policy; however, at the same time, binding standards will be introduced into the schools in order to ensure comparability between schools and students (Interview 1). Principally, teachers are expected to report on the successes or failures of guideline characteristics to the school administration, since only provisional guidelines are passed down to the schools after they have been revised; however, it is admitted that this feedback process does not always function ideally (Interview 1), and all interviews at the school level indicated that the guidelines are not felt to be particularly responsive to teachers' wishes.

The core subjects are largely the same across the German states: German, one to three foreign languages (depending on the school type), history, geography, mathematics, science (biology, chemistry, physics), art and music, physical education, civics (politics, social science, etc.), and, optionally, religious education or ethics/philosophy. This canon has never been seriously challenged since the Second World War, and the main changes have therefore occurred in optional subjects. Here, one can find a variety of subjects, such as health education, law, additional foreign languages, etc. It is intriguing that although it has long been acknowledged that the traditional canon lags behind modern society's

challenges, it still exerts great authority on academic and public discourse (see Acker, 1997, p. 5; Tenorth in Geldschläger, 1997, p. 20). It is very unlikely that the German subject canon will undergo dramatic changes in the future, since it is deeply rooted in educational tradition (Interview 1).

Similarly, the hours of instruction that are allocated to each subject are largely the outflow of tradition. No significant changes have occurred in the timetables over the past decades, aside from a general trend to reduce rather than increase periods of instruction – sometimes, for psychological reasons, in order not to overload students, but mainly for financial reasons. Instructional periods have been seriously reduced in Berlin over the past ten years after reunification, due to a shortage of qualified teachers and insufficient funding. This was especially the case for science instruction (physics, chemistry, maths), geography (reduced to only one semester a year), German as a second language for students of non-German origin, and art and music, which were combined. During the last three years, Berlin attempted to reverse this trend, but funding is still critical (Interview 1). Compared internationally, German school days are rather short: between 8 a.m. and 12 a.m. at the primary level, and between 8 a.m. and 1.30 p.m. at the secondary level. Total instructional time is between twenty and thirty periods a week, depending on the educational level. As a general rule, a maximum of two hours per day are spent on homework.

Unlike the contents of the curriculum guidelines, time allocation for the different subjects is administered rather rigidly. All the interviews at the school level indicated that there was no serious deviation from the timetables issued by the school administration. If a school intends to increase or reduce instructional hours – usually at the expense of other subjects – it has to submit a well-argued request, on the basis of which the school administration will decide whether this deviation can be permitted. Normally, the change will be introduced in the form of a school project, running for four years. Such a project will be continuously evaluated by educational experts, and many schools shun what they regard as an additional work load. Recently, the state of Nordrhein-Westfalen has introduced pools of instructional periods for each subject, which may be used flexibly within one school year. This practice has stirred interest in Berlin's school administration, and it might be applied in the near future (Interview 1). However, although theoretically there is the possibility for schools even today to move around instructional periods as long as the total fulfils the official guidelines, many teachers – particularly the older ones – are reluctant to change their ways of teaching (Interviews 2–5). On the other hand, once a project gets started, the participating teachers and students are generally very enthusiastic about it (Interview 5).

PRIMARY SCHOOL

There are no curriculum guidelines for kindergarten, and only rather general guidelines for the *Vorklasse* or pre-class, a school grade which may be chosen before attending the Grade 1. At the primary level, basic skills in reading and writing are taught; additionally, mathematics and a rudimentary knowledge of the natural sciences is acquired. Most recently, a foreign language – most commonly English, sometimes French – is taught,

starting in Grade 3. Increasingly, primary school also serves as a socializing institution, since social skills are sometimes hard or even impossible to acquire in the children's home environments.

In Berlin, students usually attend six years of primary school. Disciplinary boundaries at the primary level (Grades 1 to 4) are still weak, and fields of study are supposed to overlap. In Grade 5, real subject teaching begins. Time allocation is shown in Table 1.

Total instruction time ranges from twenty-one periods a week during the pre-school year to twenty-nine or thirty periods in Grade 6. Within this pool of hours of instruction, two periods a week are reserved for religious education, and within each school year, a total of ten periods is spent on road safety training. Out of the thirteen periods reserved for German, maths and general knowledge in first grade, three periods are used for instruction according to the students' individual needs, differentiating between fast and slow students. In Grades 5 and 6, the three new subjects of biology, geography and history may be taught *en bloc*, thus allowing for more flexibility on the part of the teachers.

In the primary school reform of the year 2000, several measures were adopted to improve the quality of the primary education:

- instructional time was increased from seventeen to twenty periods in Grade 1 and from twenty to twenty-three periods in the Grade 2;
- English was now introduced in Grade 3;
- starting in Grade 5, different levels were introduced, according to the students' skills and performance ('differentiated learning');
- for Grades 5 and 6, obligatory optional courses were introduced from which the students have to choose;

TABLE 1. Time allocation for primary school

Subject	Weekly allocated instruction periods
German	5–7 periods
Mathematics	5 periods
General knowledge (comprising sciences)	2–6 periods
Art	2 periods
Music	2–4 periods
Physical education	3 periods
First foreign language	2–5 periods
Second foreign language	6 periods (starting in Grade 5)
Biology	1–2 periods (Grades 5 and 6)
Geography	1–2 periods (Grades 5 and 6)
History/social studies	1–2 periods (Grades 5 and 6)
Additional obligatory optional courses	2 periods

- several schools were turned into half-day schools, taking care of students between 7.30 a.m. and 2 p.m. In the future, this will be extended to 4 p.m.

LOWER SECONDARY SCHOOL TYPES

The *Hauptschule* intends to provide basic general education that prepares students in accordance with their abilities and interests in vocational education. Additionally, there is also psychological support for those with unstable family backgrounds. Generally, little homework is assigned to *Hauptschule* students, although this may vary from school to school. Subjects at the *Hauptschule* are indicated in Table 2.

Evidently, the *Hauptschule* focuses on vocational education. Total allocated time is between twenty-nine and thirty periods a week. Pools of instructional periods exist for German, geography, political and social science and history, where there is some flexibility in allocating time. Also, both music and art, as well as biology and chemistry can be taught *en bloc*. As at the primary level, two periods a week are reserved for religious education. (This is the case for all school types.)

TABLE 2. Time allocation for the *Hauptschule*

Subject	Weekly allocated instruction periods
German	5 periods (Grades 7 and 8) minimum of 3 periods (Grades 9 and 10)
Geography	1–2 periods
Political science/history	1–2 periods (Grades 9 and 10)
Social science/history	2 periods (Grades 7 and 8) (Social science constituting one-third)
Physics	2 periods (Grades 8–10)
Chemistry	1 period (Grades 8–10)
Biology	2 periods (Grade 7)
	1 period (Grades 9 and 10)
Music	1.5 periods (Grades 7 and 8)
	1 period (Grades 9 and 10)
Art	1.5 periods (Grades 7 and 8)
	1 period (Grades 9 and 10)
Physical education	3 periods
Mathematics	4–5 periods
Foreign language (usually English)	3 periods
Vocational education	4–6 periods

TABLE 3. Time allocation for the *Realschule*

Subject	Weekly allocated instruction periods
German	4 periods
History/social science	2 periods
Geography	1–2 periods
Foreign language (English, French or Russian)	3–4 periods
Mathematics	4 periods
Music	1–2 periods
Art	1–2 periods
Physical education	3 periods
Physics	2 periods (starting in Grade 8)
Chemistry	1–2 periods (starting in Grade 8)
Biology	2 periods (Grades 7, 9, and 10)
Vocational education	1 period (Grades 9 and 10)
Obligatory optional courses	4 periods

At the *Realschule*, much less emphasis is placed on vocational education, while putting more stress on the core subjects of German, foreign-language instruction and mathematics. School subjects are shown in Table 3.

Total allocated time is between twenty-nine and thirty periods a week. Geography and chemistry can be taught *en bloc*, as well as art and music. The optional courses must be chosen from the four areas indicated in Table 4.

At the *Gymnasium*, only the lower secondary level (up to Grade 10) is organized in the form of binding timetables for all students (see next section for the upper secondary level). The maximum allocated time is thirty-one periods in Grade 9, only slightly higher than that for other school types. Again, geography and chemistry, as well as music and art, can be taught *en bloc*. Obligatory subjects at the lower secondary level are presented in Table 5.

All lower secondary students are expected to engage in a four-week vocational experience. This feature may be extended for *Hauptschule* and *Realschule* students, according

TABLE 4. Obligatory optional courses at the *Realschule*

A courses	Mathematics/natural sciences
C courses	Social science/economics
D courses	German/art/music
F courses	Physical education

TABLE 5. Time allocation for the *Gymnasium*

Subject	Weekly allocated instruction periods
German	3–4 periods
History/social science	2–3 periods
Geography	1–2 periods
First foreign language	3–4 periods
Second foreign language	3–4 periods
Mathematics	3–4 periods
Music	1–2 periods
Art	1–2 periods
Physical education	3 periods (2 periods for those with Greek as a third foreign language)
Physics	2 periods (starting in Grade 8)
Chemistry	1–2 periods (starting in Grade 8)
Biology	2 periods (Grades 7, 9 and 10)
Obligatory optional courses	2–3 periods (5 periods for those with Greek as a third foreign language)

to the individual school's profile. However, work-related education is still seen to be under-represented (cf. Baumert et al., 1999, p. 24ff.).

UPPER SECONDARY SCHOOL TYPES

Only the *Gymnasium* offers upper secondary level education. Starting with reforms in the 1970s, student options constitute an important basis for the upper secondary level, enabling the students to specialize in those subjects that most reflect their interests and capabilities. The upper secondary level is marked by the following characteristics:

- fixed classroom teaching is abandoned in favour of courses and individual schedules from Grade 11 onwards; compulsory areas of study include: languages, literature, the arts; social sciences; mathematics, science and technology, religion (or ethics), and physical education;
- basic and advanced courses are introduced, differing in the degree of specialization and in the number of periods taught: for basic courses, it is mostly three periods a week, with German, mathematics and foreign-language basic courses sometimes going beyond three periods; advanced courses usually require five to six periods a week;
- subject options are possible; however, during Grades 12 and 13, the minimum total is twenty-two periods per week for languages and maths/science and sixteen for the social sciences; students will usually have a total of thirty periods a week;

- differential marking is introduced: advanced courses count three times more than the basic courses.

Today, course requirements of the upper secondary level look like those shown in Table 6.

For the final exam, the students are required to be able to recall memorized knowledge, to apply knowledge independently to a comparatively new situation, and to undertake complex analyses and interpretations. During the final exams, they are examined in four subjects, which can be chosen from a given list of subjects from different subject areas; the fourth exam is oral.

Teaching subjects and allocated time at the school level: case studies

INTERVIEW QUESTIONS

Systematic evaluation of the actual impact of curriculum guidelines at the school level is rare (Vollstädt et al., 1999). However, existing long-term studies show that at the school level the most important point of reference is not the state-issued curriculum guideline, but the internal curriculum developed by the school. These findings were supported by the interview outcomes presented here. The interviews focussed on the following issues:

- ways of implementing curriculum guidelines
- the school curriculum (including its revision)

TABLE 6. Course requirements of the upper secondary level

Area		Minimum total number of weekly periods over four semesters	Required subjects	Minimum number of courses over four semesters
I	Language, literature, art	22	German:	2 courses*
			Literature/art:	2 courses
			Foreign language:	2 courses*
II	Social sciences	16	History:	required throughout upper level
III	Mathematics, natural sciences, technology	22	Mathematics:	2 courses*
			Natural sciences:	4 courses
IV	Physical education	8		
V	Religion	(left up to states)		

Source: National Institute on Student Achievement, Curriculum and Assessment, 1999, p. 61.
* Two of the following subjects: German, foreign language and mathematics, must be taken during all four semesters.

- school programmes and their influence on timetables and teaching subjects
- participation of teachers, parents and students in curriculum production and revision processes at the school level
- reaction to new or revised curriculum guidelines
- frequency with which curriculum guidelines are consulted
- possible mechanisms to control teachers' knowledge of curriculum guidelines
- engagement of teachers in further education and its impact on instruction
- the school's and teachers' knowledge of new developments in education, psychology etc.
- scope of action concerning:
  – timetables
  – selection of subjects
  – new subjects which are not covered by the guidelines
  – integrated subject instruction.
- changes over the past ten to fifteen years concerning:
  – timetables
  – subjects offered (including optional subjects)
- reactions to PISA and TIMSS
- teachers' expectations of new curriculum guidelines.

PRIMARY SCHOOL

The visited primary school is situated in West Berlin. Compared with the neighbouring primary schools, the percentage of students of non-German origin is rather low (40–45%). There is no specific school curriculum, and teachers attempt to implement around 70% of the curriculum guidelines. The remaining 30% of the time can be used for current topics. Among the teachers, the guidelines are felt to be outdated, as the 1990s have not resulted in any thoroughly revised guidelines. Moreover, while more and more topics are included in the curriculum, the time allocated to the different subjects has been reduced at the same time, leading to the paradoxical situation that students have to learn more within a shorter period of time. Production and implementation of guidelines is not seen as a reciprocal process by most teachers. The flexibility of the guidelines, on the other hand, is seen very positively, allowing for an arrangement of curricular topics according to situational needs (e.g. taking into account seasonal changes when teaching biology).

The teachers' knowledge of the curriculum guidelines is controlled through the Teachers' Conferences, which take place annually for each subject. Additionally, the headmistress can check the class diaries, into which every teacher has to enter the curricular content of each lesson. Further education as well as co-operation between teachers depend on the teachers' individual commitment. There is also an educational journal available at the school – *Praxis Grundschule* – which is passed around among teachers and from which they can obtain additional inspiration for new teaching methods. There are conferences for all teachers on specific educational topics, which take place six times a year.

Subject integrating approaches are particularly feasible in primary school, since there are only a few teachers who teach a variety of subjects, which means that the teaching of integrated subjects does not necessarily involve more than one or two teachers.

Additionally, there are project weeks every two years where students work on a specific project for one week. Apart from these project weeks, individual classes can also conduct their own projects without any bureaucratic obstacles. There are also many out-of-class activities in the afternoon.

The headmistress sees the reduction in instructional hours at the end of the 1980s and beginning of the 1990s as one of the reasons why German students show such poor results in international assessment studies. All in all, instructional hours in primary school were reduced by twelve periods at that time, with severe cuts in history, geography and biology in Grades 5 and 6. The subject of technology had been dropped completely. Only recently, measures have been taken to compensate for these cuts.

HAUPTSCHULE (LOWER-TRACK SECONDARY SCHOOL)

The student population of the West Berlin *Hauptschule* visited is comprised of more than 70% of students of non-German origin, representing a typical *Hauptschule* of a West German city. Naturally, this affects the implementation of curriculum guidelines, which are not designed for such a clientele. Twice a year, teachers have to design semester plans which formulate key qualifications and student competencies; these plans have to pass through the Teachers' Conferences, and they are controlled by the headmaster.

Integration of subjects only takes place in the form of project weeks. The school chose not to apply for the status of a project school to implement integrated subject approaches. Further education depends on the individual teacher; however, if a teacher is engaged in social-psychological education – which is quite common at a *Hauptschule* with students from problematic social backgrounds – they have to attend a seminar at least once a year.

The main focus of the school is on German as a second language. All students have to take tests in German language during a period of two-and-a-half years, and they will be taught in different classes according to their test results. There is a pool of seventy-three instructional periods for the team-teaching students of non-German origin, during which the students' performances are continuously evaluated. Those who improve their results can move on to optional courses, the results of which are also shown on the report card. Additionally, the school has designed study boxes for mathematics with different learning programmes, from which each student can choose those tasks that suit best his or her individual abilities and needs. This project will be extended to include English as well.

The amount of scope guaranteed by the guidelines is viewed very positively. Although the school's teachers generally agree that unique performance standards are necessary in order to compare students and schools, they would heavily reject more centralized control of their teaching. The school administration was judged to be very non-bureaucratic when it comes to changing the existing guidelines according to school-specific needs. In reaction to PISA, the school has tried to focus more on literacy (reading competency), not only in German, but also in other subjects. Once a year, there is a reading competition and a math olympia.

The most severe change in the curriculum has affected the subject of vocational education. In co-operation with the North German states, six schools in Berlin – the

visited school being one of them – take part in a project in which students gain vocational experiences in all kinds of professional branches. The school project, which turned out to be highly motivating for students, further supports students in career choice and job application. The project was made possible by reducing instructional hours for physical education and geography. Besides these changes, there have been no other changes in the subjects offered and in the timetables. However, it is admitted that actual instructional time in class is often sacrificed in favour of socializing functions.

REALSCHULE (MIDDLE-TRACK SECONDARY SCHOOL)

The visited school is situated in the Western part of Berlin. Some 50% of students are of non-German origin. The school does not have a school programme, but it has set its individual focus on art, music and sport, which is reflected both in the obligatory optional courses for students and in after-class activities. Additionally, the school practises 'divided class instruction', in which students are segregated according to specific criteria (such as gender, performance, interests, etc.). Apart from that, the timetables as issued by the school administration are closely followed. The headmaster would welcome pools of instructional periods which can be organized flexibly. He is particularly fond of class instruction lasting longer than a forty-five-minute period. However, so far this school's teachers, who are often aged sixty or older, have rejected the idea of introducing double periods. Around one-third of the teachers take part in further education.

Generally, the freedom resulting from the guidelines is seen positively, although it is acknowledged – as elsewhere – that there have to be binding standards by which students' performance can be evaluated across schools. The headmaster would even welcome more flexible guidelines than those in use today, as well as more integration of new media and technologies.

Integrated subject teaching is not institutionalized at this school, but mainly takes place in the form of project weeks (once a year). Although the headmaster is personally convinced by cross-subject linking of topics, so far he has not succeeded in implementing this idea at his school. However, starting with the school year 2002–2003, teachers assemble to take part in a study day, when general expectations and educational aims for the coming school year are defined more clearly than in earlier years. Also, the Grade 7 children are not placed directly in the classroom, but are taken around for two weeks to explore alternative ways of obtaining information outside the school. This project is warmly welcomed by both students and teachers.

The school has managed to secure funding for ten periods a week of homework tutoring, which is executed by professional teachers. Considering the fact that most students do not have a supportive home environment, this measure is thought to improve the students' performance. Additionally, a project on health education was started in November 2002, in co-operation with the educational department of Humboldt University.

Concerning curricular changes over the past years, the headmaster notes the reduction of instructional periods in the natural sciences, which have been reduced from double periods to single periods in Grades 7 and 8. This has resulted in a poor performance in science. But also reading competency shows vast deficits. This school's students, who had

taken part in PISA, show serious difficulties not only in solving a problem, but also in understanding the nature of the problem in the first place.

GYMNASIUM (UPPER TRACK SECONDARY SCHOOL)

The visited *Gymnasium* is situated in East Berlin. The school has its own school programme, which emphasizes ways and strategies to acquire and process knowledge, rather than simply aiming at the transmission of knowledge. The curriculum guidelines are viewed very critically by the headmaster, firstly, because they are very different in scope and age – some of them dating from seventeen or eighteen years ago – secondly, because they are very hard to control by the headmaster due to the excessive freedom they leave to the teachers in some subjects. Also, the headmaster has little power to force teachers to adopt specific standards; his function is mainly of an advisory nature. As at other schools, though, he can control curricular contents by supervising the outcomes of the Teachers' Conferences and comparing them with the existing guidelines. Feedback processes on the guidelines in interaction with the school administration are not seen to be working.

Further education is managed individually by the teachers. The headmaster feels that the school and its teachers are not sufficiently integrated into academic research. He also misses evaluation procedures and would favour more centralized examination procedures, without sacrificing all flexibility from which the teachers benefit.

Regarding integrated subject teaching, the headmaster sees little potential in the current curriculum guidelines. Often, one and the same thing is taught across different subjects, whose guidelines are seldom co-ordinated. At this school, there had been several integrated subject projects, such as combining English and geography, or getting additional 'real world' experts into the classroom. Twice, the school conducted a one-year project integrating physics, chemistry and biology, by teaching the functions of an aquarium (two periods a week). Although it was at first felt to be more work than conventional teaching, this feeling was soon compensated by the success which accompanied the project. However, projects like this are usually difficult to realise since the impact on the other classes' timetables is considered too great. Similarly, teaching subjects *en bloc* is basically an organizational problem – in contrast to primary school, where there are less teachers to be co-ordinated.

Regarding the changes that have occurred over the last years, the headmaster emphasizes the backwardness of some curriculum guidelines. This holds particularly true for computer science: no guidelines exist yet for advanced courses at the upper secondary level, so that schools are forced to develop their own guidelines. As in other schools, the headmaster criticizes the severe cuts that took place during the early 1990s in the natural sciences, mathematics and foreign-language instruction.

On-going developments in the organization of school subjects

Due to limited political, financial, legal and motivational scope for innovation and reforms, curriculum research today – including research on time allocation and instructional

time – is not very productive. Although in many German states, important new elements such as key qualifications, integrated subject approaches, student-centred learning, etc., have been introduced, there is little research on general theories on curriculum. Case studies, mostly for specific subjects, prevail (Biehl, Hopmann & Künzli, 1998).

Apparently, Germany's biggest tension is that between its plurality of educational opportunities and school types on the one hand and the need for central controlling mechanisms to give this plurality a direction on the other (Interview 1). Educational experts and teachers all agree that changes in the real world – such as changes in the family structure, in the economy, in social, cultural and geographic infrastructures, in the media and new technologies, etc. – call for a different approach towards schooling (see Fthenakis, 2000). The catch-phrase of 'the knowledge society' (see Wolff & Stock, 2000) has entered educational and public discourse. It has been realised that the connections and linkages between the different knowledge domains are as important as the knowledge domains themselves. However, this insight has not yet sufficiently pervaded education at German schools. The importance of showing ways of how to obtain and process knowledge is still underestimated (Lankenau, 2000, p. 60; see also the Delphi survey in Fthenakis, 2000, p. 72ff.).

Naturally, if issues such as core competencies and integrated subject approaches are taken seriously, they will have grave consequences for the rather rigid, traditional idea of timetables. All research findings indicate that traditional subject teaching, with its disciplinary orientation and its fixed hours of instruction allocated to each subject per week, is no longer suited to today's challenges. The following two examples of on-going developments reflect these general trends.

SCHOOL PROGRAMMES AND PROFILES

After the reforms of the 1970s and their amendments in the 1980s, the German ministries of education have been increasingly careful to enact further reforms, since the final outcomes seldom reflected the initial plans. In order to improve school quality in a more context-sensitive manner, schools were given the opportunity of developing their own school programmes, thus turning the schools themselves into motors of reform at the local level (cf. Haenisch, 1998). School programmes can be seen as a kind of transformer of curriculum guidelines, shifting the responsibility for implementation away from the individual teacher to the school level. School programmes have also been called 'management strategies' by the Berlin school administration;[5] they include issues like defining educational aims, core values, priorities and student competencies; encouraging further education for teachers and education in a broader sense (attacking the so-called 'forty-five-minute factory learning'); integrating the outside world into the school, etc.

Following the trend towards more school autonomy, Berlin is also considering the establishment of contracts with schools in which specific issues are agreed upon. External agencies will then evaluate if the contract has been executed properly (Interview 1). Since 2003, each school in Berlin is obliged to define its own school programme. It remains to be seen how this will actually influence teaching subjects and time allocation. Additionally, and congruently with the school programmes, schools will have to set up their

own profiles, which can be seen as a kind of product spectrum, showing what the school can offer its students.

In addition to school programmes and profiles, several 'pilot projects' have been started in Berlin, which try to transform, at the local level, formerly problematic schools into model schools (cf. Gaude, 1994; 1997). The idea is first to look at how certain ideas work at the local level before prescribing comprehensive reforms for all. All schools that have taken part in the various projects have modified the existing curriculum guidelines and timetables in order to improve their attractiveness to students and their educational quality.

INTEGRATED SUBJECTS

Among the ministries of education, the issue of integrated subjects was first raised at the beginning of the 1990s. The integrated subject approach follows a general trend that can be found also in the economy (e.g. integrated management), where problem orientation is emphasized in favour of disciplinary orientation (cf. Geldschläger, 1997, p. 11ff.).

Integrated subject instruction takes place mostly in the form of school projects, not in everyday class instruction. There are some schools that prescribe for each school year at least one subject-integrating project for every grade, with a presentation at the end (see Rössler, 1998, p. 54). In reality, however, it is hard to know how many schools in Germany are actually involved in integrated subject projects. Certainly, most schools do not go beyond linking separate subjects (instead of dissolving them altogether). Sometimes, curriculum guidelines co-ordinate various subjects. Integrated subject topics include, for example, nature and environment, health/life/death, gene technology, co-existence of cultures, etc. (Dalhoff, 1997; Emler et al., 1997; Lauer et al., 1998; Kremer, 2000). Often, schools open up to other sectors of society and seek partners outside school. The crucial question, of course, is: do integrative studies need their own curriculum guidelines, or should their implementation simply be left to the individual schools and teachers?

Conclusion

TIMSS and, even more severely, PISA have revealed that the German students' weakest points are important competencies, such as general logical thinking and producing independent interpretations. The German education system seems to be oriented too little towards problem-solving and the applicability of acquired knowledge. However, in spite of conservative calls for more clearly defined curricular contents, Berlin has decided to follow the example of the Scandinavian countries instead, where guidelines can be used much more flexibly than is the case in any German state today. Thus, it is the narrowness and rigidity of the curriculum guidelines, rather than the excessive freedom, that is deemed responsible for the unfavourable developments in the German school system.

Notes

1. For more information on the law, see (as of 24 February 2004): http://www.sensjs. berlin.de/schule/rechtsvorschriften/thema_rechtsvorschriften.asp.

2. See the new law on education (note 1).
3. The interview partners referred to in this article were as follows: Angelika Hüfner, Personal Consultant of the School Senator of Berlin (22 October 2002, indicated as Interview 1); the headmaster of a *Hauptschule* in Wedding, West Berlin (25 October 2002, Interview 2); the headmaster of a *Realschule* in Tiergarten, West Berlin (28 October 2002, Interview 3); the headmistress of a primary school in Kreuzberg, West Berlin (7 November 2002, Interview 4); and the headmaster of a *Gymnasium* in Friedrichshain, East Berlin (14 November 2002, Interview 5).
4. In some states, as in Berlin, there is an additional school type called *Gesamtschule*, a comprehensive secondary school offering the leaving certificates for all three school types.
5. See the new law on education (note 1).

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