Report from the FP7 project:

Assess Inquiry in Science, Technology and Mathematics Education

Educational system factors influencing student assessment methods in science, technology and mathematics education - National Reports

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Summary

This deliverable presents the characteristics of the educational system for each partner's country. Information was gathered by an online questionnaire structured in four dimensions: system and school organization and management, teacher education and management, science education and forms of student assessment.

This document is organized as follows: for each country the rational for each dimension is given, followed by the description of the educational system of the country in respect to that dimension.

The objective of this report is to enable each Assist-Me partner to present to each NSP the characteristics of their country. Each NSP has to read and discuss the characteristics of his or her educational system. In case of a difference of opinion, the NSP and the researchers have to reach an agreement. Feedback should be given to the UJF team before the first week of November.

CYPRUS

System organization and management

Curriculum

The school system is totally centralized.

Schools and teachers haven't any autonomy excepted in primary schools.

There isn't any curriculum evaluation.

Funding

Primary and lower secondary schools have a low autonomy towards the financial matters.

Schools are funded at the local and central level.

Schools are in charge of the expenditures.

Classes' sizes are managed at the central level.

Students' performances do not impact the funding.

Examinations are part of the school budget for primary and lower secondary.

Examinations are part of school budget and centralized for upper secondary and vocational and technical secondary.

Teacher management

Teacher management is very centralized.

All teachers have the same wages. Teachers are evaluated every second year after the 8th year of service. The evaluation includes a prearranged classroom visit by the subject inspector. Theoretically, the outcome of evaluation is taken into consideration in decisions of promotion to assistant principal or principal, normally in the last few years before retirement. In practice, because the vast majority of evaluations assign the same grade out of 40 to all the teachers in the same year of service promotions end up being decided mostly upon the number of years of services. There are no consequences of this evaluation on teacher professional development Teacher professional development is mostly organized on a voluntary basis and is not systematic.

Teaching profession is attractive because of: - Permanent work - Good working conditions (working hours, holidays) - Relatively high salaries - Social status - Contribution to society

Teacher collaboration

School system allows and organizes teacher collaboration.

Teachers actually collaborate.

Teachers and teacher organization, students and parents play a small role in the school decision-making process.

Structure of educational system
Students are expected to choose a career track at 15.

Class size is comprised between 12 and 25 students whatever the level.

The part of private schools at primary level is quite low (7%), but the representation of private schools is higher at secondary level except for vocational and technical secondary.

Central state authorities are in charge of monitoring schools performance.

There is local targeting of resources for primary education and lower secondary schools.

School Leaders
The formal role of school leaders is effective in continuous improvement of instruction in all schools and at all levels. They have a little role to play in teacher on-going evaluation of pedagogical strengths and weaknesses and teacher professional development.

Student performances monitoring by schools
Schools do collect data on student performances in all schools and at all levels.

These data are accessible to teachers and parents.

Teachers have also to keep a detailed record of student progress for internal use in all schools. This record does not offer interpretative information about student difficulties neither does offer recommendation for individual student improvement.

Elements that characterize the structure of the educational system relevant for testing and implementing the ASSIST-ME project.
Methods suggested by the curriculum for students' evaluation. Resources available for teachers to use for their students' evaluation. Teachers' professional development related to students' evaluation. National exams for entering universities.

Policy decisions in Cyprus are made at a very centralized level by the Ministry of Education and Culture. It is not possible for any project to produce materials or tools that can be adopted widely by teachers through a bottom-up approach.

Teachers should be carefully selected because not everyone supports the idea of assessing students learning.

Teacher education and Professional development

Teacher pre-service education
The required education level for teachers is 4 years of higher education for all level.

The actual education level of teachers is also 4 years of higher education.

The duration of teacher training program is 4 years for primary education and 1 for all secondary levels.

The amount of ECTS spent on educational courses during teacher education is more than 120 for primary education and is between 31 and 60 for all secondary education level.

Teacher educators and researchers are involved in pre-service education with respect to pedagogical competences at the primary level; experienced teachers, teacher educators and researchers at the secondary level.

Teacher academic selection process
A competitive examination is required to enter pre-service teacher training for primary education but not for the other levels.

A teaching practicum is required as part of pre-service training for all levels.

A competitive examination is not required to enter the teaching profession.

For primary education, there is no credential required to start teaching in addition to the education diploma neither to become a fully qualified teacher. In the contrary, in secondary education, there is no credential required in addition to the education diploma to start teaching but one is required to become a fully qualified teacher. This credential requires a teaching practicum.

IBST and FA in teacher initial education
The part of Inquiry Based Sciences Teaching (IBST) in science, math and technology teacher initial education is low at primary education and lower secondary levels and very low at upper secondary and vocational and technical secondary levels.

IBST appeared less than 5 years ago in primary education and lower secondary teacher initial education, and has not yet appeared at upper secondary and vocational and technical secondary.

FA appeared more than 15 years ago at primary education level in teacher initial education and between 5 and 15 years ago at secondary levels.

CPD
With respect to teacher professional development –particularly in relation to mathematics, science and technology teaching methods– there is no management or strategic control; responsibility for involvement is devolved to the school and individual teachers..

In-service teacher education is designed and provided by teacher education departments, experienced teachers and inspectors.

Teacher preparation programs are not evaluated.

IBST and FA in CPD
The part of IBST in CPD programs is noticeable for primary education and lower secondary and very low for upper secondary and vocational and technical secondary.

The part of FA in CPD programs is very low at all levels.

FA appeared less than 5 years ago for all levels.

Age of teacher population
The average age of teachers is 37 years for primary education and 47 years for secondary education.

Elements that characterize teacher education and professional development relevant for testing and implementing the ASSIST-ME project.
Primary teachers have bachelor degrees on teaching. Lower and upper secondary teachers have bachelor degrees on their disciplines and one year training on teaching.

Science education

Competence model
The competence model is explicit for primary education and lower secondary and not present for upper secondary and vocational and technical secondary.

The competence model specifies competencies related to IBST in a noticeable way for primary education and lower secondary.

The competence model specifies competencies related to FA in a weak way for primary education and lower secondary.

STM in the curriculum
Physics, chemistry, earth and biology are taught as an integrated subject in primary education. Mathematics and technology are taught as separated subjects.

STM are taught as separated subjects in secondary education.

Time allocated to math, science and technology teaching:

	Average time at grade 5	Average time at grade 9	Average time at grade 12	Minimum time at grade 12	Maximum time at grade 12
Physics	1	2		2	7
Chemistry	0	1		1	6
Earth	0	2		0	5
Biology	0	0		0	5
Mathematics	6	3		3	8

technology	1	1		0	5

Activities mentioned in mathematics, sciences and technology curriculum in primary school or in secondary school (1=yes; 0=no; ND=No data):

	Math		Science		Technology	
	Primary	Secondary	Primary	Secondary	Primary	Secondary
Diagnosing problems	0	0	1	0	1	1
Identifying questions	0	0	1	1	1	1
Searching for information	1	1	1	1	1	1
Considering alternative solutions	1	1	1	1	1	1
Creating mental representations	0	0	1	1	0	0
Constructing and using modeling	1	1	1	1	1	1
Formulating hypotheses	0	0	1	1	0	0
Planning investigations	1	0	1	1	1	1
Finding structures	1	1	0	0	0	0
Researching conjectures	0	0	1	1	0	0
collecting and interpreting data	1	1	1	1	1	1
Evaluating results	1	1	1	1	1	1
Using evidence	0	0	1	0	0	0
Debating with peers	0	0	1	0	0	0

Searching for generalizations	1	1	1	1	0	0
Dealing with uncertainty	0	0	0	0	0	0
Constructing prototypes	0	0	0	0	1	1

Words mentioned in mathematics, sciences and technology textbook in primary or secondary school (1=yes; 0=no; ND=No data):

	Math		Science		Technology	
	Primary	Secondary	Primary	Secondary	Primary	Secondary
Diagnosing problems	1	0	0	0	1	1
identifying questions	0	0	1	1	1	1
Searching for information	1	1	1	1	1	1
Considering alternative solutions	1	1	1	1	1	1
Creating mental representations	0	0	1	1	0	0
Constructing and using modeling	1	1	1	1	1	1
Formulating hypotheses	0	0	1	1	0	0
Planning investigations	1	0	1	1	1	1
Finding structures	1	1	0	0	0	0
Researching conjectures	0	0	1	1	0	0
collecting and interpreting data	1	1	1	1	1	1

Evaluating results	1	1	1	1	1	1
Using evidence	0	0	1	0	0	0
Searching for alternatives	1	1	1	1	1	1
Debating with peers	0	0	1	0	0	0
Searching for generalizations	1	1	1	1	0	0
Dealing with uncertainty	0	0	0	0	0	0
Constructing prototypes	0	0	0	0	1	1

Resources, part of IBST and practical work
Some IBSTME resources for teachers exist at primary education level; very little resources exist for secondary education.

The part of inquiry based methods in science teaching is low for primary education and very low for secondary.

The part of practical work is noticeable at all levels.

Elements that characterize mathematics, science and technology education relevant for testing and implementing the ASSIST-ME project.
All schools are well equipped with materials and laboratory facilities.

Form of student assessment

Day to day assessment
Teachers are in charge of designing day to day assessment at all levels.

A lot of resources for teacher, in order to support the uptake of day-to-day assessment related to science, technology and mathematics education, exists at all levels.

Student's progress is communicated to them by face-to-face meetings and marks at primary education, mainly by marks at secondary level.

Students are very little involved in the assessment of their own performance.

Student's achievement is communicated to their parents using face-to-face meetings and marks at all levels.

There are some dedicated meetings for helping students and parents to make sense of the assessment information and decide strategies for improving their learning at all levels.

The consequences of this evaluation on student's career are grade repetition for primary education, and grade repetition and allocation to another pathway for secondary education.

Summative assessment
The programs strongly require summative assessment in math and science. The requirement level is low in technology.

Teachers and local, regional or central authorities are in charge of designing student's summative assessment. Teachers are in charge of performing student's summative assessment at primary education and lower secondary levels and teachers and local, regional or central authorities at upper secondary and vocational and technical secondary levels. Teachers are in charge of correcting student's summative assessment at primary education and lower secondary levels and teachers and local, regional or central authorities at upper secondary and vocational and technical secondary levels.

A lot of resources exist in order to support the uptake of summative assessment. The consequences of this evaluation on student's career are grade repetition for primary education, and grade repetition and allocation to another pathway for secondary education.

Grade repetition is not often practiced.

The ways to cope with students who encounter difficulties are student allocation to a class featured with respect to his or her specific needs and grade repetition for primary education and lower secondary levels, and grade repetition and student allocation to another pathway for upper secondary and vocational and technical secondary levels.

Elements that characterize student evaluation relevant for testing and implementing the ASSIST-ME project.
The tradition in Cyprus is to play emphasis only on summative assessment. Formative assessment methods would be an important innovation for our educational system.

CZECH REPUBLIC

System organization and management

Curriculum

Central or state authorities have the authority for curriculum changes.

Schools are highly autonomous towards the implementation of the national curriculum.

Teachers are quite not autonomous within the schools.

Curriculum is evaluated at all levels.

Funding

Schools have a low level of autonomy towards the financial matters.

Funding is managed at a local level for primary and lower secondary schools.

Funding is managed at a regional level for upper secondary schools.

Funding is managed at a local, regional or central level for vocational and technical secondary schools.

Schools are in charge of expenditures and classes' size.

Students' performances do not impact the funding.

Examinations are funded at the central level.

Teacher management

Schools and local authorities are in charge of teacher hiring for primary and lower secondary schools.

Schools and regional authorities are in charge of teacher hiring for upper secondary and technical and vocational schools.

Teachers have medium and long term contracts after a probation year.

Schools are in charge of teacher evaluation. The first employment contract for the teacher at a given school is for 1 year. This contract may not be extended depending on the result of the evaluation. There is no system of professional development connected with career progression.

Wages are low.

Some research results (for example the results of the research performed by Institute of Sociology of Academy of Sciences ÄŒR on www.cos.cas.cz) confirmed that teaching profession has high social status (on fifths place, after physician, scientist, teacher at the university, nurse). But the teachers do not perceive it so (for example the behavior of parents does not confirm their high social status). The social status of teachers continues to decrease (in agreement with results of TALIS 2013).

Teacher collaboration
Teacher collaboration depends on school organization.

Teachers and teachers' organizations play a small role in the school decision making process.

Parents and students have a formal way to provide inputs regarding the functioning of schools but have little influence.

Structure of educational system
Students are expected to choose a career track at 15.

Class sizes are quite small: between 19 and 21 students.

The part of private schools at primary level is quite low, but the representation of private schools is higher at upper secondary and vocational and technical secondary representing 25% of schools.

Central state authorities and independent agencies are in charge of monitoring schools performance at upper secondary and lower secondary levels, and schools, regional and central state authorities for vocational and technical secondary.

There is no local targeting of resources with respect to parents' characteristics.

School Leaders
The formal role of school leaders is effective in continuous improvement of instruction in all schools and at all levels. They have a quite important role to play in teacher professional development but no role in teacher on-going evaluation of pedagogical strengths and weaknesses .

Student performances monitoring by schools
Schools collect data on student performances in some schools and at all levels.

These data are accessible to teachers, students and parents.

Teachers have also to keep a detailed record of student progress for internal use in some schools. This record offer interpretative information about student difficulties but it does not offer recommendation for individual student improvement.

Elements that characterize the structure of the educational system relevant for testing and implementing the ASSIST-ME project.
Lack of career structure, high autonomy of school (dealing with the content and organization of teaching), funding of schools according to the number of students.

System of evaluation of schools' education quality is not reflected in funding.

Considerable autonomy of schools in providing a space for collaboration of teachers, parents and students. If teachers are interested to make innovations they usually have the option. The headmaster decides on the forms of evaluation, but every teacher can use formative assessment in the lessons, if he/she decides so.

Teacher education and Professional development

Teacher pre-service education
The required education level for teachers is 5 years of higher education for all level.

The actual education level of teachers is also 5 years of higher education.

The duration of teacher training program is 5 years for all levels.

The amount of ECTS spent on educational courses during teacher education is more than 120 for all levels.

Teacher educators, experienced teachers and researchers are involved in pre-service education with respect to pedagogical competences at all levels.

Teacher academic selection process
A competitive examination is required to enter pre-service teacher training for all levels.

A teaching practicum is required as part of pre-service training for all levels.

A competitive examination is not required to enter the teaching profession.

There is no credential required to start teaching in addition to the education diploma neither to become a fully qualified teacher.

IBST and FA in teacher initial education
The part of Inquiry Based Sciences Teaching (IBST) in science, math and technology teacher initial education is very low at all levels.

IBST appeared between 5 and 15 years ago in teacher initial education at all levels.

FA appeared in teacher initial education between 5 and 15 years ago at all levels.

CPD
With respect to teacher professional development –particularly in relation to mathematics, science and technology teaching methods– there is no management or strategic control; responsibility for involvement is devolved to the school and individual teachers.

In-service teacher education is designed by teacher education departments, researchers and local, regional or central authorities and provided by teacher education departments, experienced teachers and researchers.

Teacher preparation programs are evaluated by local, regional or central authorities.

IBST and FA in CPD
The part of IBST and FA in CPD programs is very low for all levels.

IBST appeared between 15 and 5 years ago in CPD programs for all levels

FA appeared between 15 and 5 years ago in CPD programs for all levels.

Age of teacher population
The average age of teachers is 45 years for primary education and lower secondary and 47 years for upper secondary and vocational and technical secondary schools.

Elements that characterize teacher education and professional development relevant for testing and implementing the ASSIST-ME project.
Higher education is required for teachers but more than 10% of the teachers do not meet that. Professional development is not mandatory. Teacher educators are usually partly engaged in research. Colleges that provide in-service teacher training are highly autonomous in deciding what it will contain. Programs are evaluated by central government - Accreditation Commission (an independent body within the Ministry). IBST and formative assessment has little tradition. There are local and private initiatives in this direction, usually as a part (and continuation) of various (inter)national projects.

Science education

Competence model
The competence model is explicit at all levels.

The competence model specifies competencies related to IBST in a strong way for all levels.

The competence model does not specify competencies related to FA for any levels.

STM in the curriculum
Physics, chemistry, earth and biology are taught as an integrated subject in primary education. Mathematics and technology are taught as separated subjects.

STM are taught as separated subjects in secondary education.

Time allocated to math, science and technology teaching:

	Average time at grade 5	Average time at grade 9	Average time at grade 12	Minimum time at grade 12	Maximum time at grade 12
Physics	0.5	2	2	0	4
Chemistry	0.5	2	2	0	4
Earth	1	2	2	0	2
Biology	1	2	2	0	4
Mathematics	4	4	3	0	5
technology	1	1	1	0	4

Activities mentioned in mathematics, sciences and technology curriculum in primary school or in secondary school (1=yes; 0=no; ND=No data):

	Math		Science		Technology	
	Primary	Secondary	Primary	Secondary	Primary	Secondary
Diagnosing problems	1	1	1	1	1	1
identifying questions	1	1	1	1	1	1
Searching for information	1	1	1	1	1	1
Considering alternative solutions	1	1	1	1	1	1
Creating mental representations	1	1	1	1	1	1
Constructing and using modeling	1	1	1	1	1	1
Formulating hypotheses	0	1	1	1	0	0
Planning investigations	0	1	0	1	0	0
Finding structures	1	1	1	1	0	0
Researching conjectures	0	1	0	1	0	0
Collecting and interpreting data	1	1	1	1	0	0
Evaluating results	1	1	1	1	1	1
Using evidence		1		1	0	0
Debating with peers	1	1	1	1	1	1
Searching for generalizations	0	1	0	1	0	0
Dealing with uncertainty	0	1	0	1	0	0

Constructing prototypes	0	0	0	0	0	1

Words mentioned in mathematics, sciences and technology textbook in primary or secondary school (1=yes; 0=no; ND=No data):

	Math		Science		Technology	
	Primary	Secondary	Primary	Secondary	Primary	Secondary
Diagnosing problems	1	1	1	1	1	1
identifying questions	1	1	1	1	1	1
Searching for information	1	1	1	1	1	1
Considering alternative solutions	1	1	1	1	1	1
Creating mental representations	1	1	1	1	1	1
Constructing and using modeling	1	1	1	1	1	1
Formulating hypotheses	1	1	1	1	0	0
Planning investigations	0	1	0	1	0	0
Finding structures	1	1	1	1	0	0
Researching conjectures	0	1	0	1	0	0
collecting and interpreting data	0	0	1	1	0	0
Evaluating results	1	1	1	1	1	1
Using evidence		1		1		
Searching for alternatives	1	1	1	1	1	1

Debating with peers	1	1	1	1	1	1
Searching for generalizations		1	0	1	0	0
Dealing with uncertainty	1	1	0	1	0	0
Constructing prototypes	0	0	0	0	0	1

Resources, part of IBST and practical work
Very few IBSTME resources exist for teachers at all levels.

The part of inquiry based methods in science teaching is very low at all levels.

The part of practical work is low at all levels.

Elements that characterize mathematics, science and technology education relevant for testing and implementing the ASSIST-ME project.
Teaching in our country is traditionally focused on the transmission of information (deductive methods of teaching), even though the curriculum is aimed at creation of competences. There are not enough supportive materials for teachers. Teachers seem to be tired of permanent innovations.

Form of student assessment

Day to day assessment
Teachers are in charge of designing day to day assessment at all levels.

Few resources for teacher in order to support the uptake of day-to-day assessment related to science, technology and mathematics education exists at primary education and lower secondary, and very few at upper secondary and vocational and technical secondary.

Student's progress is communicated to them mainly by booklets and marks, and sometimes by face-to-face meetings at all levels

Students are very little involved in the assessment of their own performance.

Student's achievement is communicated to their parents using mainly booklets and marks, and sometimes face-to-face meetings at all levels.

There are dedicated meetings for helping students and parents to make sense of the assessment information and decide strategies for improving their learning at all levels.

There are no consequences of this evaluation on student's career.

Summative assessment
The programs strongly require summative assessment in math, science and technology.

Teachers and local, regional or central authorities are in charge of designing student's summative assessment. Teachers are in charge of performing student's summative assessment at primary education and lower secondary levels and teachers and local, regional or central authorities at upper secondary and vocational and technical secondary levels. Teachers and local, regional or central authorities are in charge of correcting student's summative performance at all levels.

Very few resources exist in order to support the uptake of summative assessment.

The consequences of this evaluation on student's career are grade repetition and allocation to another pathway for primary education and lower secondary levels and allocation to another pathway for upper secondary and vocational and technical secondary levels.

Grade repetition is not often practiced.

The ways to cope with students who encounter difficulties are student allocation to a class featured with respect to his or her specific needs and grade repetition for primary education and lower secondary levels, and student allocation to another pathway for upper secondary and vocational and technical secondary levels.

Elements that characterize student evaluation relevant for testing and implementing the ASSIST-ME project.
Not enough supportive materials for teachers (elaborated topics including evaluation criteria). Information for professionals and parents.

DENMARK

System organization and management

Curriculum

Schools and teachers (especially in primary and lower secondary) have a great level of autonomy within a flexible central framework.

Funding

Primary and lower secondary schools have a low level of autonomy towards the financial matters.

Upper secondary and vocational and technical secondary schools are partially autonomous.

Primary and lower secondary schools are funded at a local level.

Upper secondary and vocational and technical secondary schools are funded at a national level.

Local authorities are in charge of expenditures for primary and lower secondary schools.

Central authorities are in charge of expenditures for upper secondary and vocational and technical secondary schools.

Classes' sizes are managed at the school level and at the central level.

Students' performances impact the funding for upper secondary and vocational and technical secondary schools.

Examinations are funded at the central level and school level.

Teacher management

Schools are in charge of teacher hiring.

Teachers are not civil servants.

Teachers have long term contracts.

Schools are in charge of teacher evaluation. There are no formal procedures for teacher evaluation. Generally, the evaluation of a teacher does not have many consequences. There is no outspoken effect of a teacher's evaluation on his or her job security. If the headmaster evaluates a teacher, the headmaster could require that the teacher attends some in-service training.

Teacher's wages in primary and lower secondary schools are equal to the average wage of the population with the same level of education.

Teacher's wages in upper secondary schools and vocational and technical secondary are slightly lower than the average wage of the population with the same level of education.

There has been a criticism of primary school teachers in the general public discourse, partly due to low PISA scores. Traditionally teachers have had a relatively high status, but now we see some regional differences. In the rural areas the teachers still have a relatively high status. Upper secondary school: While many science students at university may not want to become teachers, the teaching profession is well respected and has a relatively high status.

Teacher collaboration
School system allows and organizes teacher collaboration.

Teachers actually collaborate a lot.

Teachers and teacher organization play a major role in the school decision making process.

Students and parents play a significant role in the school decision making process.

Structure of educational system
Students are expected to choose a career track at 16.

Class sizes are quite small at primary education and lower secondary but quite large at upper secondary.

Schools and local authorities, and central state are in charge of monitoring school performances for primary education and lower secondary; schools and central state for upper secondary and vocational and technical secondary levels.

There is a local targeting of resources at all levels with respect to parents' characteristics.

School Leaders
The formal role of school leaders is effective in continuous improvement of instruction in all schools and at all levels. They have a quite important role to play in teacher ongoing evaluation of pedagogical strengths and weaknesses and in teacher professional development at all levels.

Student performances monitoring by schools
Schools do collect data on student performances in all schools and at all levels.

These data are accessible to teachers, students and parents.

Teachers have also to keep a detailed record of student progress for internal use in some schools. This record does offer interpretative information about student difficulties and recommendation for individual student improvement.

Elements that characterize the structure of the educational system relevant for testing and implementing the ASSIST-ME project.
It is up to the local school management to decide whether they want to participate or not. There are no strict norms for teacher work; it depends on a local negotiation between teacher and headmaster. This makes it necessary to start the discussion with headmasters and teachers in good time ahead (January if we want to implement in the Fall).

There is a long tradition for local interpretation of the curriculum and there is relatively high freedom for choosing teaching materials and approaches including inquiry teaching. So teachers are open to such projects and the schools have high degree of autonomy.

Teacher education and Professional development

Teacher pre-service education
The required education level for teachers is 4 years of higher education for primary education and lower secondary and 5 years of higher education for upper secondary.

The actual education level of teachers is also 4 years of higher education for primary education and lower secondary and 5 years of higher education for upper secondary.

The duration of teacher training program is 4 years for primary education and lower secondary, 1 year for upper secondary levels and half a year for vocational and technical secondary levels.

The amount of ECTS spent on educational courses during teacher education is between 91 and 120 for primary education and lower secondary and is between 0 and 30 for upper secondary and vocational and technical secondary levels.

Teacher educators and experienced teachers are involved in pre-service education with respect to pedagogical competences at the primary education level and lower secondary, experienced teachers, researchers and inspectors at upper secondary and vocational and technical secondary levels.

Teacher academic selection process
A competitive examination is not required to enter pre-service teacher training for all levels.

A teaching practicum is required as part of pre-service training for all levels.

A competitive examination is not required to enter the teaching profession.

There is no credential required to start teaching in addition to the education diploma neither to become a fully qualified teacher, excepted for vocational and technical secondary level. This credential requires a teaching practicum.

IBST and FA in teacher initial education
The part of Inquiry Based Sciences Teaching (IBST) in science, math and technology teacher initial education is very low at all levels.

IBST appeared between 5 and 15 years ago in teacher initial education at all levels.

FA appeared in teacher initial education more than 15 years ago at all levels.

CPD
With respect to teacher professional development –particularly in relation to mathematics, science and technology teaching methods– there is some 'light touch' control with an accreditation or 'kite-marking' system having a role to play in quality control of provision and with some obligation for teachers to take part in PD but with responsibility for involvement again being devolved.

In-service teacher education is designed by teacher education departments, researchers, inspectors and local, regional or central authorities and independent providers for primary education and lower secondary and by experienced teachers, researchers, inspectors and independent providers for upper secondary and vocational and technical secondary levels.

In-service teacher education is provided by teacher education departments, researchers, inspectors and local, regional or central authorities for primary education and lower secondary and by teacher education departments and local, regional or central authorities for upper secondary and vocational and technical secondary levels.

Teacher preparation programs are evaluated by teacher education departments for primary education and lower secondary, and by local, regional or central authorities for upper secondary and vocational and technical secondary levels.

IBST and FA in CPD
The part of IBST and FA in CPD programs is very low for all levels.

IBST appeared between 15 and 5 years ago in CPD programs for all levels

FA appeared more than 15 years ago in CPD programs for all levels.

Age of teacher population
The average age of teachers is 45 years for primary education and 48 years for secondary education

Elements that characterize teacher education and professional development relevant for testing and implementing the ASSIST-ME project.
Many teachers do not have a vocabulary for assessment or for IBSE. In primary and lower secondary the teachers have a relatively weak subject specific background, whereas in upper secondary school, the teachers have a relatively weak pedagogical background. In upper secondary, teachers prefer subject specific courses for their prof. development, and rarely attend pedagogical courses. There is a relatively high degree of freedom for schools and teachers regarding professional development.

Science education

Competence model

The competence model is explicit at all levels.

The competence model specifies competencies related to IBST in a weak way for all levels.

The competence model does not specify competencies related to FA for any levels.

STM in the curriculum

Physics, chemistry and technology are taught as an integrated subject in primary education and lower secondary. Mathematics and technology are taught as separated subjects.

STM are taught as separated subjects in upper secondary schools.

Time allocated to math, science and technology teaching:

	Average time at grade 5	Average time at grade 9	Average time at grade 12	Minimum time at grade 12	Maximum time at grade 12
Physics	0	1.1			
Chemistry	0	1.1			
Earth	0	0.75			
Biology	0	0.75			
Mathematics	3	3			
technology	1.5	0			

Activities mentioned in mathematics, sciences and technology curriculum in primary school or in secondary school (1=yes; 0=no; ND=No data):

	Math		Science		Technology	
	Primary	Secondary	Primary	Secondary	Primary	Secondary
Diagnosing problems	1	1	1	1	1	1
identifying questions	1	1	1	1	1	1
Searching for information	1	1	1	1	1	1
Considering alternative solu-	1	1	1	1	1	1

tions						
Creating mental representations	ND	ND	ND	ND	ND	ND
Constructing and using modeling	1	1	0	1	0	0
Formulating hypotheses	0	0	1	1	1	0
Planning investigations	0	1	1	1	1	1
Finding structures	1	1	1	1	1	1
Researching conjectures	0	0	1	1	1	1
collecting and interpreting data	1	1	1	1	1	1
Evaluating results	1	1	1	1	1	1
Using evidence	1	1	1	1	0	0
Searching for alternatives	1	1	1	1	1	1
Debating with peers	1	1	1	1	0	0
Searching for generalizations	1	1	1	1	1	1
Dealing with uncertainty	0	0	0	1	0	0
Constructing prototypes	0	0	0	0	0	1

Words mentioned in mathematics, sciences and technology textbook in primary or secondary school (1=yes; 0=no; ND=No data):

	Math		Science		Technology	
	Primary	Secondary	Primary	Secondary	Primary	Secondary
Diagnosing	ND	ND	ND	ND	ND	ND

problems						
identifying questions	ND	ND	ND	ND	ND	ND
Searching for information	ND	ND	ND	ND	ND	ND
Considering alternative solutions	ND	ND	ND	ND	ND	ND
Creating mental representations	ND	ND	ND	ND	ND	ND
Constructing and using modeling	ND	ND	ND	ND	ND	ND
Formulating hypotheses	ND	ND	ND	ND	ND	ND
Planning investigations	ND	ND	ND	ND	ND	ND
Finding structures	ND	ND	ND	ND	ND	ND
Researching conjectures	ND	ND	ND	ND	ND	ND
collecting and interpreting data	ND	ND	ND	ND	ND	ND
Evaluating results	ND	ND	ND	ND	ND	ND
Using evidence	ND	ND	ND	ND	ND	ND
Searching for alternatives	ND	ND	ND	ND	ND	ND
Debating with peers	ND	ND	ND	ND	ND	ND
Searching for generalizations	ND	ND	ND	ND	ND	ND
Dealing with uncertainty	ND	ND	ND	ND	ND	ND
Constructing	ND	ND	ND	ND	ND	ND

prototypes						

Resources, part of IBST and practical work
Some IBSTME resources for teachers exist at all levels.

The part of inquiry based methods in science teaching is low for all levels.

The part of practical work is high at all levels.

Elements that characterize mathematics, science and technology education relevant for testing and implementing the ASSIST-ME project.
The Danish curricula for both primary and lower and upper secondary afford IBSTME. This means that, all things being equal, it will be relatively easy to convince teachers that the Assist-me interventions are aligned with the curriculum.

Form of student assessment

Day to day assessment
Teachers are in charge of designing day to day assessment at all levels.

Few resources for teacher in order to support the uptake of day-to-day assessment related to science, technology and mathematics education exists at primary education and lower secondary, and very few at upper secondary and vocational and technical secondary levels.

Student's progress is communicated to them mainly by face-to-face meetings at all levels, and also by marks at upper secondary. Portfolios are also used at primary education and lower secondary.

Students are involved in the assessment of their own performance.

Student's achievement is communicated to their parents using mainly face-to-face meetings and sometimes portfolios at primary education and lower secondary, booklets are strongly used at primary education, but not at lower secondary and upper secondary.

There are very few dedicated meetings for helping students and parents to make sense of the assessment information and decide strategies for improving their learning at all levels.

The consequences of this evaluation on student's career are student allocation to a temporary group specifically featured with respect to his or her strengths and weaknesses, student allocation to a permanent (1 year or more) group featured with respect to his or her strengths and weaknesses and grade repetition for primary education and lower secondary, and student allocation to another pathway for upper secondary and vocational and technical secondary.

Summative assessment

No data about the programs' requirement in respect to summative assessment in math, science and technology.

Teachers and local, regional or central authorities are in charge of designing student's summative assessment at secondary levels. Teachers are in charge of performing and correcting student's summative performance at secondary levels.

No data about the resources available in order to support the uptake of summative assessment.

The consequences of this evaluation on student's career are grade repetition and allocation to another pathway for secondary education.

Grade repetition is not often practiced.

The ways to cope with students who encounter difficulties are student allocation to a class specifically featured with respect to his or her level of achievement, student allocation to a class featured with respect to his or her specific needs and grade repetition for primary education and lower secondary levels, and student allocation to another pathway and grade repetition for upper secondary and vocational and technical secondary levels.

FINLAND

System organization and management

Curriculum
Schools and teachers have a great level of autonomy within a flexible central framework.

Funding
Schools are highly autonomous towards the financial matters.

Funding is managed at a local level.

Schools are in charge of expenditures.

Classes' size is managed by each school.

Students' performances do not impact the funding.

Examinations are funded at the central level and school level.

Teacher management
Local authorities are in charge of teacher hiring.

Teachers are not civil servants.

Teachers have long term contracts.

Schools are in charge of teacher evaluation. Decision of the continuation of employment is based on teacher evaluation. Principals of schools are responsible to observe if teachers are not able to work. There are annual "development discussions" between principals and teachers. A principal may offer professional support to a teacher.

Wages are equal to the average wage of the population with the same level of education.

Primary teacher education is very attractive. For example, one of 30 applicants is accepted in The Department of Teacher Education (Univ. of Jyväskylä). Secondary teacher education is not popular.

Teacher collaboration
Schools do not provide support for teacher collaboration.

Teachers do not collaborate.

Structure of educational system
Students are expected to choose a career track at 16.

Class size is rather small for primary and lower secondary levels (no information for upper secondary and vocational and technical secondary schools).

The part of private schools is very low at all levels.

There is no monitoring of schools performances.

There is a local targeting of resources at all levels with respect to parents' characteristics.

School Leaders
The formal role of school leaders is effective in continuous improvement of instruction at all levels. They have no role at all to play in teacher on-going evaluation of pedagogical strengths and weaknesses and a very little role to play in teacher professional development.

Student performances monitoring by schools
Schools do not collect data on student performances.

Teachers do not have to keep a detailed record of student progress for internal use in some schools.

Elements that characterize the structure of the educational system relevant for testing and implementing the ASSIST-ME project.
In Finland you can contact straight to a school. Commonly, schools decide if they to want participate in research studies or not. Mostly, schools can give permission for research.

There is no tracking.

Teacher education and Professional development

Teacher pre-service education
The required education level for teachers is 5 years of higher education for all levels.

The actual education level of teachers is also 5 years of higher education.

The duration of teacher training program is 5 years for all levels excepted for vocational and technical secondary levels where the duration in 1 year.

The amount of ECTS spent on educational courses during teacher education is between 31 and 60 at all levels.

Teacher educators are involved in pre-service education with respect to pedagogical competences at all levels.

Teacher academic selection process
A competitive examination is required to enter pre-service teacher training only for primary education.

A teaching practicum is required as part of pre-service training for all levels.

A competitive examination is not required to enter the teaching profession.

There is no credential required to start teaching in addition to the education diploma neither to become a fully qualified teacher.

IBST and FA in teacher initial education
The part of Inquiry Based Sciences Teaching (IBST) in teacher initial education is noticeable at all levels.

IBST appeared between 5 and 15 years ago in teacher initial education at all levels.

FA appeared in teacher initial education more than 15 years ago at all levels.

CPD
With respect to teacher professional development –particularly in relation to mathematics, science and technology teaching methods– there is no management or strategic control; responsibility for involvement is devolved to the school and individual teachers.

In-service teacher education is designed and provided by teacher education departments and independent providers.

Teacher preparation programs are not evaluated.

IBST and FA in CPD
The part of IBST in CPD programs is noticeable for all levels.

The part of FA is very low at all levels.

IBST appeared between 15 and 5 years ago in CPD programs for all levels.

FA appeared more than 15 years ago in CPD programs for all levels.

Age of teacher population
No data.

Elements that characterize teacher education and professional development relevant for testing and implementing the ASSIST-ME project.
There is no obligatory in-service education for professional development. On the other hand, teachers may select what kind of in-service education they want to attend to.

Science education

Competence model
The competence model is implicit for all levels.

The competence model does not specify competencies related to IBST or FA for all levels

STM in the curriculum
Physics, chemistry, earth and biology are taught as an integrated subject in primary education. Mathematics and technology are taught as separated subjects.

STM are taught as separated subjects in secondary education.

Time allocated to math, science and technology teaching:

	Average time at grade 5	Average time at grade 9	Average time at grade 12	Minimum time at grade 12	Maximum time at grade 12
Physics					
Chemistry					
Earth					
Biology					
Mathematics	18	13			
technology					

Activities mentioned in mathematics, sciences and technology curriculum in primary school or in secondary school (1=yes; 0=no; ND=No data):

	Math		Science		Technology	
	Primary	Secondary	Primary	Secondary	Primary	Secondary
Diagnosing problems	ND	ND	ND	ND	ND	ND
identifying questions	0	0	1	1	0	0
Searching for information	ND	ND	ND	ND	ND	ND
Considering alternative solutions	ND	ND	ND	ND	ND	ND
Creating mental representations	ND	ND	ND	ND	ND	ND
Constructing and using modeling	ND	ND	ND	ND	ND	ND
Formulating hypotheses	0	0	1	1	0	0
Planning investigations	0	0	1	1	0	0
Finding structures	ND	ND	ND	ND	ND	ND

Researching conjectures	ND	ND	ND	ND	ND	ND
collecting and interpreting data	0	0	1	1	0	0
Evaluating results	ND	ND	ND	ND	ND	ND
Using evidence	0	0	1	1	0	0
Searching for alternatives	ND	ND	ND	ND	ND	ND
Debating with peers	ND	ND	ND	ND	ND	ND
Searching for generalizations	ND	ND	ND	ND	ND	ND
Dealing with uncertainty	ND	ND	ND	ND	ND	ND
Constructing prototypes	ND	ND	ND	ND	ND	ND

Words mentioned in mathematics, sciences and technology textbook in primary or secondary school (1=yes; 0=no; ND=No data):

	Math		Science		Technology	
	Primary	Secondary	Primary	Secondary	Primary	Secondary
Diagnosing problems	ND	ND	ND	ND	ND	ND
identifying questions	ND	ND	ND	ND	ND	ND
Searching for information	ND	ND	ND	ND	ND	ND
Considering alternative solutions	ND	ND	ND	ND	ND	ND
Creating mental representations	ND	ND	ND	ND	ND	ND
Constructing and using modeling	ND	ND	ND	ND	ND	ND

Formulating hypotheses	ND	ND	ND	ND	ND	ND
Planning investigations	ND	ND	ND	ND	ND	ND
Finding structures	ND	ND	ND	ND	ND	ND
Researching conjectures	ND	ND	ND	ND	ND	ND
collecting and interpreting data	ND	ND	ND	ND	ND	ND
Evaluating results	ND	ND	ND	ND	ND	ND
Using evidence	ND	ND	ND	ND	ND	ND
Searching for alternatives	ND	ND	ND	ND	ND	ND
Debating with peers	ND	ND	ND	ND	ND	ND
Searching for generalizations	ND	ND	ND	ND	ND	ND
Dealing with uncertainty	ND	ND	ND	ND	ND	ND
Constructing prototypes	ND	ND	ND	ND	ND	ND

Resources, part of IBST and practical work

Few IBSTME resources for teachers exist at all levels.

The part of inquiry based methods in science teaching is low for primary education and lower secondary and very low for upper secondary and vocational and technical secondary.

The part of practical work is high for primary education and lower secondary and low for upper secondary and vocational and technical secondary.

Elements that characterize mathematics, science and technology education relevant for testing and implementing the ASSIST-ME project.
In science there are a lot of practical work (primary and lower secondary schools), but "inquiry" is teacher centered.

Form of student assessment

Day to day assessment
Teachers are in charge of designing day to day assessment at all levels.

No data about resources for teacher in order to support the uptake of day-to-day assessment related to science, technology and mathematics education.

Student's progress is communicated to them by face-to-face meetings and some marks at primary education and lower secondary, mainly by marks at upper secondary and vocational and technical secondary.

Students are very little involved in the assessment of their own performance.

Student's achievement is communicated to their parents using face-to-face meetings and marks at primary education and mainly by marks at secondary level.

There are no dedicated meetings for helping students and parents to make sense of the assessment information and decide strategies for improving their learning at all levels.

The consequences of this evaluation on student's career are student allocation to a temporary group specifically featured with respect to his or her strengths and weaknesses and student allocation to a permanent (1 year or more) group featured with respect to his or her strengths and weaknesses for primary education and lower secondary

Summative assessment
The programs strongly require summative assessment in math, science and technology.

Teachers are in charge of designing, performing and correcting student's summative assessment.

Some resources exist in order to support the uptake of summative assessment.

The consequences of this evaluation on student's career are student allocation to a temporary group specifically featured with respect to his or her strengths and weaknesses and student allocation to a permanent (1 year or more) group featured with respect to his or her strengths and weaknesses for primary education and lower secondary levels.

Grade repetition is not often practiced.

The ways to cope with students who encounter difficulties are student allocation to a class featured with respect to his or her specific needs for primary education, lower secondary and vocational and technical secondary levels.

Elements that characterize student evaluation relevant for testing and implementing the ASSIST-ME project.

There are no systematic formative assessment practices.

FRANCE

System organization and management

Curriculum
Programs are managed at the state level.

Textbooks are chosen by teachers.

Funding
Primary schools are quite not autonomous towards the financial matters.

Lower and upper secondary schools have a low level of autonomy towards the financial matters.

Funding is managed at local and at central levels for primary and lower secondary schools.

Funding is managed at regional local and at central levels for upper secondary schools, and for vocational and technical secondary schools.

Students' performances do not impact the funding.

Schools are in charge of the expenditures.

Classes' sizes are decided at the central level.

Students' performances do not impact the funding.

Examinations are funded at the central level.

Teacher management
Central authorities are in charge of teacher hiring.

Most teachers are civil servants with long term contracts.

Central authorities are in charge of teacher evaluation.

Teacher evaluation has no consequences on teacher career or teacher professional development (in-service education).

Wages are quite low.

The profession is becoming less attractive than before because of longer studies, low salaries, bad working conditions and an increasing demand in terms of tasks devoted to teachers. For instance, only 21000 students applied for the selection to secondary teacher training in 2011 when they were 38000 in 2010.

Teacher collaboration
School system allows and organizes teacher collaboration.

Teachers do not collaborate a lot.

Teachers play a major role in the school decision making process.

Teacher organizations do not play any role in the school decision making process.

Parents and students have a formal way to provide inputs regarding the functioning of schools but have little influence.

Structure of educational system
Students are expected to choose a career track at 14.

Class size is quite high except in vocational and technical secondary (19) and increases as the level gets higher.

The part of private schools is high whatever the level. Central state authorities are in charge of monitoring school performances. There is local targeting of resources at all levels with respect to parents' characteristics.

School Leaders
The formal role of school leaders is effective in continuous improvement of instruction and varies from school to school. They have a very little role in teacher on-going evaluation of pedagogical strengths and weaknesses at all secondary levels and no role at all in primary education. They have a very little role to play in teacher professional development.

Student performances monitoring by schools
Schools do collect data on student performances in all schools and at all levels.

These data are accessible to teachers in all schools and parents in some schools.

Teachers do not have to keep a detailed record of student progress for internal use in some schools.

Elements that characterize the structure of the educational system relevant for testing and implementing the ASSIST-ME project.
High social and academic selection and segregation. Presence of a local targeting of resources in order to cope with local specificities.

Collected data are based on summative assessment through a very centralized process that doesn't encourage teachers to develop formative assessment methods or to give feedback to their students.

Teacher education and Professional development

Teacher pre-service education
The required education level for teachers is 5 years of higher education for all levels.

The actual education level of teachers is also 5 years of higher education.

The duration of teacher training program is 2 years for all levels.

The amount of ECTS spent on educational courses during teacher education is more than 61 and 90 for all levels.

Teacher educators, experienced teachers, researchers and inspectors are involved in pre-service education with respect to pedagogical competences at all levels.

Teacher academic selection process
A competitive examination is not required to enter pre-service teacher training at all levels.

A teaching practicum is required as part of pre-service training at all levels.

A competitive examination is required to enter the teaching profession.

There is a credential required to start teaching in addition to the education diploma as well as to become a fully qualified teacher. This credential requires a teaching practicum

IBST and FA in teacher initial education
The part of Inquiry Based Sciences Teaching (IBST) in teacher initial education is noticeable at all levels.

IBST appeared more than 15 years ago in teacher initial education at all levels.

FA appeared more than 15 years ago at primary education level in teacher initial education and between 5 and 15 years ago at secondary levels.

CPD
With respect to teacher professional development –particularly in relation to mathematics, science and technology teaching methods– there is no management or strategic control; responsibility for involvement is devolved to the school and individual teachers.

In-service teacher education is designed by inspectors for primary education, by inspectors and local, regional or central authorities for secondary education.

In-service teacher education is provided by teacher education departments, inspectors and experienced teachers for all levels.

Teacher preparation programs are evaluated by local, regional or central authorities for all levels.

IBST and FA in CPD
The part of IBST in CPD programs is very low for all levels.

The part of FA in CPD programs is low for all levels.

IBST appeared in CPD programs more than 15 years ago for primary education, between 15 and 5 years ago for secondary education.

FA appeared in CPD programs more than 15 years ago for primary education, between 15 and 5 years ago for secondary education

Age of teacher population
The average age of teachers is 40 years for primary education and 43 years for lower secondary and upper secondary and 45 for vocational and technical secondary.

Elements that characterize teacher education and professional development relevant for testing and implementing the ASSIST-ME project.
CPD programs focus too narrowly on the new elements of the curriculum.

Science education

Competence model

The competence model is explicit for all levels.

The competence model specifies competencies related to IBST in a strong way for primary education and lower secondary.

The competence model specifies competencies related to FA in a noticeable way for primary education and lower secondary.

STM in the curriculum
Physics, chemistry, earth, technology and biology are taught as an integrated subject in primary education. Mathematics is taught as a separated subject.

Physics and chemistry are taught as an integrated subject so as biology and earth, mathematics and technology as separated subjects in secondary education.

Time allocated to math, science and technology teaching:

	Average time at grade 5	Average time at grade 9	Average time at grade 12	Minimum time at grade 12	Maximum time at grade 12
Physics	0.4	1		0	3.5
Chemistry	0.4	1		0	3.5
Earth	0.4	0.75		0	2.75
Biology	0.4	0.75		0	2.75
Mathematics	5	4			8
technology	0.4	2		0	8

Activities mentioned in mathematics, sciences and technology curriculum in primary school or in secondary school (1=yes; 0=no; ND=No data):

	Math		Science		Technology	
	Primary	Secondary	Primary	Secondary	Primary	Secondary
Diagnosing	1	1	1	1	1	1

problems						
identifying questions	1	1	1	1	1	1
Searching for information	1	1	1	1	1	1
Considering alternative solutions	1	1	1	1	1	1
Creating mental representations	0	0	0	0	0	0
Constructing and using modeling	0	1	0	1	0	1
Formulating hypotheses	1	1	1	1	1	1
Planning investigations	1	1	1	1	1	
Finding structures	0	0	0	0	1	1
Researching conjectures	1	1	0	0	0	0
collecting and interpreting data	0	0	1	1	1	1
Evaluating results	1	1	1	1	1	1
Using evidence	1	1	1	1	1	1
Searching for alternatives	1	1	1	1	1	1
Debating with peers	1	1	1	1	1	1
Searching for generalizations	1	1	1	1	1	0
Dealing with uncertainty	0	1	0	1	0	1
Constructing	0	0	0	0	1	1

prototypes						

Words mentioned in mathematics, sciences and technology textbook in primary or secondary school (1=yes; 0=no; ND=No data):

	Math		Science		Technology	
	Primary	Secondary	Primary	Secondary	Primary	Secondary
Diagnosing problems	ND	0	1	0	1	0
identifying questions	ND	0	1	1	1	1
Searching for information	1	1	1	1	1	1
Considering alternative solutions	ND	0	1	0	1	0
Creating mental representations	ND	ND	ND	ND	ND	ND
Constructing and using modeling	ND	1	1	1	1	1
Formulating hypotheses	ND	1	1	1	1	1
Planning investigations	ND		1		1	
Finding structures	ND	0	1	0	1	0
Researching conjectures	ND	1	0	0	0	0
collecting and interpreting data	ND	1	1	1	1	1
Evaluating results	ND	1	1	1	1	1
Using evidence	ND	1	0	0	0	0
Searching for alternatives	ND	0	0	0	1	1

Debating with peers	ND	0	1	0	1	1
Searching for generalizations	ND	0	1	1	1	0
Dealing with uncertainty	ND	NP	NP	NP	NP	NP
Constructing prototypes	ND	0	0	0	1	1

Resources, part of IBST and practical work
A lot of IBSTME resources for teachers exist at all levels.

The part of inquiry based methods in science teaching is low for primary education, very low for lower secondary and upper secondary and noticeable for vocational and technical secondary levels.

The part of practical work is very low for primary education, noticeable at lower secondary and upper secondary and high for vocational and technical secondary.

Form of student assessment

Day to day assessment
Teachers are in charge of designing day to day assessment at all levels.

Few resources for teacher in order to support the uptake of day-to-day assessment related to science, technology and mathematics education exists at all levels.

Student's progress is communicated to them mainly by booklets and marks, and some face-to-face meetings at all levels. Portfolios are strongly used at vocational and technical secondary.

Students are involved in the assessment of their own performance at primary education and vocational and technical secondary schools, and very little involved at lower secondary and upper secondary schools.

Student's achievement is communicated to their parents using mainly by booklets and marks, and some face-to-face meetings

There are few dedicated meetings for helping students and parents to make sense of the assessment information and decide strategies for improving their learning at all levels.

The consequences of this evaluation on student's career are student allocation to a temporary group specifically featured with respect to his or her strengths and weaknesses.

Summative assessment
The programs strongly require summative assessment in math, science and technology.

Teachers and local, regional or central authorities are in charge of designing student's summative assessment. Teachers are in charge of performing and correcting student's summative performance.

No resources exist in order to support the uptake of summative assessment.

The consequences of this evaluation on student's career are grade repetition and student allocation to a temporary group specifically featured with respect to his or her strengths and weaknesses for primary education and lower secondary levels and also allocation to another pathway for upper secondary and vocational and technical secondary levels.

Grade repetition is often practiced at primary education and lower secondary and less often at upper secondary and vocational and technical secondary levels.

The ways to cope with students who encounter difficulties grade repetition for primary education and lower secondary levels, and student allocation to another pathway for upper secondary and vocational and technical secondary levels.

Elements that characterize student evaluation relevant for testing and implementing the ASSIST-ME project.
Formative assessment is explicitly mentioned in programs but the weakness of the support given to the teachers impedes its uptake

GERMANY

System and school organisation and management

When the curriculum is designed at the national level, without any school autonomy, teachers are reluctant to develop effective new teaching strategies.

Depending on the diversity of the school context (school intake, class size, funding and curricula) within the country, variability in the development of IBE in STM or FA/SA might be observed.

When the system is collective leadership oriented, teachers have the opportunity to cooperate, and they are motivated in taking into account students' diversity of wills, needs and knowledge.

Dimensions	Variables
1- System organisation and management	Centralization of educational system Curriculum Funding and resources management Teaching profession
	Structure of educational system age for choosing a career track number of students per class ratio public/private schools local targeting of resources school performance monitoring
2- Schools organisation and management	Teacher collaboration dedicated in-school structure dedicated time to collaborate teacher small groups exchanges / student learning and engagement
	Leadership teacher /decision making at school level teacher /decision making at regional level

	students, parents, and community /school school leaders /instruction improvement school leaders / teacher evaluation school leaders / teacher development program
	Student performances monitoring school data collecting for monitoring student progress teacher recording of student progress for internal use record / student difficulties (nature and recommendations)

Curriculum

The school system is centralized.

Schools and teachers have little autonomy.

There is a process of curriculum evaluation.

Funding

Primary, lower and upper secondary schools have a low autonomy towards the financial matters. VTS have a greater autonomy towards the financial matters.

Schools are funded at the local level.

Schools are in charge of the expenditures.

Classes' sizes are managed at the school and the central level.

Students' performances do not impact the funding.

Funding and resources for examinations are centralized for all levels.

Teacher management

Schools and central or state authorities are in charge of hiring teachers. All teachers are civil servants at PE, LS and US and most of them are civil servants at VTS. Teachers have long term contracts at all levels.

Regional or sub-regional authorities are in charge of teachers' evaluation at PE. Schools are in charge of teachers' evaluation at LS, US and VTS level.

Wages are low for PE, average for LS and quite high for US and VTS.

The outcome of evaluation may help or prevent a carrier, but possibilities for a career in schools are rare. A sufficient outcome is prerequisite for getting tenure after first 3 years of employment. There are no consequences of this evaluation on teacher professional development.

How attractive is teaching profession : - salary - work load - ratio: OK, but high mean course frequencies (up to 30 students per course); therefore partially high psychological load professional prerequisites (at least 5 years university + subsequent 2 years courses of preparation in advance): HIGH Structural support by authorities: LITTLE; but most teachers are "single fighters" and love to stay so; quite independent working Time management and planning of course study: QUITE FREE in wide limits; no tight evaluation ATTRACTIVE: for those, who love to work with children, young people NOT ATTRACTIVE: Low reputation of teachers in the society; problems with not motivated students and their parents

Teacher collaboration

School system allows and organizes teacher collaboration but teachers have no dedicated time to collaborate with each other.

Teachers actually collaborate at PE level, some collaborate at LS and US level and very few collaborate at VTS level.

Teachers, students and parents play a role in the school decision-making process.

Structure of educational system

Students are expected to choose a career track at 16.

Class size are average, between 19 students for VTS level and 25 for LS level.

The part of private schools at PE at LS level is quite low (10%), but the representation of private schools is higher at US level (14%) and very low (3%) for vocational and technical secondary.

Schools and central state authorities are in charge of monitoring schools performance.

There is no local targeting of resources.

School Leaders

The formal role of school leaders is effective in continuous improvement of instruction in all schools and at all levels. They have a great role to play in teacher on-going evaluation of pedagogical strengths and weaknesses and teacher professional development.

Student performances monitoring by schools

Schools do not collect data on student performances in all schools and at all levels.

Teachers keep a detailed record of student progress for internal use in all schools. This record does offer interpretative information about student difficulties and offers recommendation for individual student improvement in some schools.

Elements that characterize the structure of the educational system relevant for testing and implementing the ASSIST-ME project.

The ministry for educational affairs has to consent to any testing in school.

From school year 2013/14 on, there is only one school type left next to the Gymnasium at the lower secondary school level. It is called "Gemeinschaftsschule". At this school type chemistry, physics, and biology are not taught separately but as on school subject called science.

When the professional development and the trial implementation of the assessment methods within the ASSIST-ME project will be realized it is important to choose teachers that are good networkers in order to reach as many teachers as possible. There are only few possibilities for teachers to collaborate.

Teacher education and professional development

The data about teacher characteristics in terms of education, training and experience provides information on:

1/ the possible part of teacher population trained in IBSTME

2/ the type of teacher education to be recommended.

Dimensions	Variable
3- Teacher education and professional development	Education (initial) teacher education level (required & actual) model of initial teacher education part of ECTS / educational courses part of IBST (actual & 15 years ago) part of FA/SA (actual & 15 years ago)
	Training (CPD) in-service education mandatory CPD programs (design & evaluation) part of IBST (actual & 15 years ago)

	part of FA/SA (actual & 15 years ago)
	Teacher population characteristics ratio age ratio experience length

Teacher pre-service education

The required education level for teachers is 5 years of higher education for PE level, and more than 5 years of higher education for LS, US and VTS levels.

The actual education level of teachers is 5 years of higher education for PE and LS levels and more than five years of higher education for US and VTS levels.

The duration of teacher training program is 5.5 years for PE and LS, 6.5 years for US level and 6 years for VTS level.

The amount of ECTS spent on educational courses during teacher education is more than 61 to 90 for all levels.

Teacher educators and experienced teachers are involved in pre-service education with respect to pedagogical competences all levels.

Teacher academic selection process

A competitive examination is required to enter pre-service teacher training at all levels.

A teaching practicum is required as part of pre-service training for all levels.

A competitive examination is required to enter the teaching profession.

No credential is required to start teaching in addition to the education diploma neither to become a fully qualified teacher.

IBST and FA in teacher initial education

The part of Inquiry Based Sciences Teaching (IBST) in science, math and technology teacher initial education is significant at PE, LS and US levels and low at vocational and technical secondary level.

IBST appeared between 15 to 5 years ago at all levels.

FA appeared more than 15 years ago at all levels.

CPD

Concerning teacher professional development –particularly in relation to mathematics, science and technology teaching methods– there is no management or strategic control and responsibility for involvement is devolved to the school and individual teacher.

In-service teacher education is designed, provided and evaluated by teacher education departments.

IBST and FA in CPD

The part of IBST in CPD programs is very lox for all levels.

IBST appeared between 15 and 5 years ago in CPD programs.

The part of FA in CPD programs is noticeable for PE level and low for secondary levels.

Elements that characterize teacher education and professional development relevant for testing and implementing the ASSIST-ME project.

When developing the assessment methods, it might be necessary to emphasize the advantages of formative assessment as well as of IBE. Both issues are usually seen as time consuming and therefore are often not realized even if they are part of teacher education and professional development.

Science education

When the competence model is explicit the coordination between FA/SA is more effective, when the science departments are coordinated or integrated, students can more easily create meaning, and when IBE is explicitly mentioned in STM steering texts for teachers, the IBE uptake is more effective.

Dimensions	Variable
4- Science education	Role of competence model competence model explicit or implicit specific competencies related to IBSTME competencies related to Formative Assessment
	Importance of science and math subject in the curriculum STM: separate or integrated subjects amount of time allocated STM connection with other subjects

	Importance of IBSTME IBSTME mentioned in STM curriculum IBSTME mentioned in STM textbook p IBSTME resources for teachers part of inquiry based methods in science teaching part of practical work in science teaching

Competence model

The competence model is implicit for all levels.

The competence model strongly specifies competencies related to IBST for all levels.

STM in the curriculum

Physics, chemistry, earth and biology are taught as an integrated subject in primary education. Mathematics and technology are taught as separated subjects.

Physics, chemistry and biology are taught as an integrated subject in LS level.

STM are taught as separated subjects in US level.

Time allocated to math, science and technology teaching:

	Average time at grade 5	Average time at grade 9	Average time at grade 12	Minimum time at grade 12	Maximum time at grade 12
Physics		2	1	0	4
Chemistry	0	2	1	0	4
Earth	2	2	2	0	4
Biology	2	2	2	0	4
Mathematics	5	4	4	4	4
technology	0	1	0	0	0

Sciences are commonly taught in connection with history and geography in primary schools.

Activities mentioned in mathematics, sciences and technology curriculum in primary school or in secondary school (1=yes; 0=no; ND=No data):

	Math		Science		Technology	
	Primary	Secondary	Primary	Secondary	Primary	Secondary
Diagnosing problems	1	1	1	1		
Identifying questions	1	1	1	1		
Searching for information	0	0	1	1		
Considering alternative solutions	1	1	0	0		
Creating mental representations	0	0	0	1		
Constructing and using modeling	0	1	0	1		
Formulating hypotheses	0	1	0	1		
Planning investigations	0	0	1	1		
Finding structures	1	1	0	1		
Researching conjectures	1	1	1	1		
collecting and interpreting data	1	1	1	1		
Evaluating results	1	1	1	1		
Using evidence	0	0	0	1		
Debating with peers	1	1	1	1		

Searching for generalizations	0	1	0	1		
Dealing with uncertainty	1	1	0	1		
Constructing prototypes	0	0	0	0		

Words mentioned in mathematics, sciences and technology textbook in primary or secondary school (1=yes; 0=no; ND=No data):

	Math		Science		Technology	
	Primary	Secondary	Primary	Secondary	Primary	Secondary
Diagnosing problems	1	0	0	0		
identifying questions	1	1	1	1		
Searching for information	1	1	1	1		
Considering alternative solutions	0	0	0	0		
Creating mental representations	0	0	0	1		
Constructing and using modeling	0	1	0	1		
Formulating hypotheses	1	1	1	1		
Planning investigations	1	1	1	1		
Finding structures	1	1	0	1		
Researching conjectures	1	1	0	1		

collecting and interpreting data	1	1	1	1		
Evaluating results	1	1	1	1		
Using evidence	0	0	0	0		
Searching for alternatives	0	1	0	0		
Debating with peers	1	1	0	1		
Searching for generalizations	1	1	0	1		
Dealing with uncertainty	1	1	0	1		
Constructing prototypes	0	0	0	0		

Resources, part of IBST and practical work

Some IBSTME resources for teachers exist at PE, LS and US level; little resources exist for VTS level.

The part of inquiry based methods in science teaching is high for all levels.

The part of practical work is noticeable at PE level and high for secondary levels.

Form of student assessment

1/As assumed in the ASSIST-ME project, when teachers are involved in the whole assessment process (at each stage from the design to the correction) they are more aware of the necessity to monitor all their students learning processes.

2/ Knowing the effective teachers' practices of assessment will provide information on the implementation of FA in the classroom.

Dimensions	Variable
5- Form of student assessment	Day-to-day assessment designing, performing and correcting day-to-day students' assessment students' progress communication students involvement in assessment of their own (and others') performance dedicated meetings for helping students and parents to make sense of the assessment information consequences of evaluation on students' career
	Summative assessment designing, performing and correcting SA teachers involvement in SA design consequences of evaluation on students' career
	Students' career and grade retention grade retention allowance grade retention limitation grade retention frequency coping with students who encounter difficulties

Day to day assessment

The programs do not require day-to day assessment.

No resources, in order to support the uptake of day-to-day assessment related to science, technology and mathematics education, exists.

Student's progress is communicated to them by face-to-face meetings and marks at all levels.

Students are very little involved in the assessment of their own performance at PE and VTS levels and strongly involved at LS and US levels.

Student's achievement is communicated to their parents using face-to-face meetings and marks at all PE and LS levels, and mainly by marks at US and VTS levels.

There are some dedicated meetings for helping students and parents to make sense of the assessment information and decide strategies for improving their learning at PE and LS levels.

The consequences of this evaluation on student's career are grade repetition and student allocation to a temporary group specifically featured with respect to his or her strengths and weaknesses for primary education, and student allocation to a temporary group specifically featured with respect to his or her strengths and weaknesses, student allocation to a permanent (1 year or more) group featured with respect to his or her strengths and weaknesses, grade repetition and allocation to another pathway for LS education.

Summative assessment

The programs strongly require summative assessment in math. There is no SA in science and technology.

Teachers, teacher education departments and local, regional or central authorities are in charge of designing student's summative assessment. Teachers are in charge of performing and correcting student's summative assessment.

A lot of resources exist in order to support the uptake of summative assessment. There are no consequences of this evaluation on student's career.

Grade repetition is not often practiced.

The ways to cope with students who encounter difficulties are grade repetition for PE level and grade repetition and student allocation to another pathway for LS level.

Elements that characterize student evaluation relevant for testing and implementing the ASSIST-ME project.

Students and teachers are not used to formative assessment methods, especially at lower secondary and upper secondary schools. The range of differently used assessment methods is quite small. Therefore, good examples should be developed in order to convince teachers of the advantages. Besides, each school lessons takes 45 minutes. Thus, the assessment methods should be time-saving and easy to realize.

SWITZERLAND

System organization and management

Curriculum

Programs are managed at the regional level.

Schools and teachers have little autonomy excepted towards the time allocation to each topic.

Funding

Primary and lower secondary schools are partially autonomous towards the financial matters.

Upper secondary and vocational and technical secondary schools are highly autonomous.

Funding is managed at a local and regional level for primary and lower secondary schools.
Funding is managed at a regional level for upper secondary schools.

Funding is managed at local, regional or central levels for vocational and technical secondary schools.

Schools and local authorities are in charge of expenditures.

Classes' sizes are decided at the regional level.

Students' performances do not impact the funding.

No examinations.

Teacher management

Local authorities and schools are in charge of teacher hiring.

Teachers can be hired for short, medium or long contracts.

Schools, local and regional authorities are in charge of teacher evaluation. Teacher assessment impacts on wages only in a few cantons.

Wages are very low for primary teachers and quite low for secondary teachers.

The teaching profession is attractive in times of bad economic status and of high rate of unemployment. A study in 2005 revealed that teacher profession is viewed as well-paid and ascribed with high prestige and a safe job situation. The teaching profession is also viewed as being unattractive as schools have to fulfill a lot of requirements in a highly individualized society. Teachers are stressed by a lot of administration work, school development processes and the requirements of quality assurance.

Teacher collaboration

Teacher collaboration depends on school organization.

Some teachers collaborate.

Teachers and teachers' organizations play a significant role in the school decision making process.

Parents and students have a little influence on school initiatives.

Structure of educational system
Students are expected to choose a career track when they are 15-year old.

No data on class size.

The part of private schools increases, as the level gets higher. The part of private schools in vocational and technical secondary is very high. Regional and central state authorities are in charge of monitoring school performances at all levels. There is local targeting of resources at all level with respect to parents' characteristics.

School Leaders
The formal role of school leaders is effective in continuous improvement of instruction in most schools and at all levels. They also have a major role in teacher on-going evaluation of pedagogical strengths and weaknesses and a quite important role in teacher professional development.

Student performances monitoring by schools
Schools do not collect data on student performances.

Teachers have to keep a detailed record of student progress for internal use in all schools and at all levels. This record does offer interpretative information about student difficulties and recommendation for individual student improvement.

Elements that characterize the structure of the educational system relevant for testing and implementing the ASSIST-ME project.
The Swiss education system is characterized by federalism, and organized in a decentralized manner. The primary responsibility for education lies with the cantons (states). They are responsible for the education system, except where the Federal Constitution declares the Confederation, or the Confederation and cantons together, to be competent. There is no national education ministry. It is also important to mention that there is strong academic freedom for teachers.

As from autumn 2014 there will be a new curriculum for 21 of the 26 Swiss cantons. The aim of this new curriculum, called "Lehrplan 21", is a greater alignment of schools, lessons and teaching. Although "Lehrplan 21" leads to a higher centralization, the Swiss education system will still be characterized by federalism.

Students and parents do rather not participate in school development projects. Formative Assessment is not frequently practiced.

Teacher education and Professional development

Teacher pre-service education

The required education level for teachers is 3 years of higher education for primary education, 4 years for lower secondary, 5 years for upper secondary, and 3 years for vocational and technical secondary levels.

The actual education level of teachers is also 3 years of higher education for primary education, 4 years for lower secondary, 5 years for upper secondary, and 3 years for vocational and technical secondary levels.

The duration of teacher training program is 3 years for primary education, 4 years for lower secondary and 1 for upper secondary levels.

The amount of ECTS spent on educational courses during teacher education is more than 120 for primary and lower secondary and is between 31 and 60 for upper secondary and vocational and technical secondary levels.

Teacher educators and experienced teachers are involved in pre-service education with respect to pedagogical competences at all levels.

Teacher academic selection process

A competitive examination is not required to enter pre-service teacher training at all levels.

A teaching practicum is required as part of pre-service training at all levels.

A competitive examination is required to enter the teaching profession.

There is no credential required to start teaching in addition to the education diploma neither to become a fully qualified teacher.

IBST and FA in teacher initial education

The part of Inquiry Based Sciences Teaching (IBST) in science, math and technology teacher initial education is noticeable at all levels.

IBST appeared between 5 and 15 years ago in teacher initial education at all levels.

FA appeared in teacher initial education more than 15 years ago at all levels.

CPD

With respect to teacher professional development –particularly in relation to mathematics, science and technology teaching methods– there is some ‘light touch’ control with an accreditation or ‘kite-marking’ system having a role to play in quality control of provision and with some obligation for teachers to take part in professional development but with responsibility for involvement again being devolved.

In-service teacher education is designed and provided by teacher education departments and local, regional or central authorities for all levels.

Teacher preparation programs are evaluated by teacher education departments and local, regional or central authorities for all levels.

IBST and FA in CPD
The part of IBST in CPD programs is high for all levels.

The part of FA in CPD programs is low for all levels.

IBST and FA appeared between 15 and 5 years ago in CPD programs for all levels.

Age of teacher population
No data.

Elements that characterize teacher education and professional development relevant for testing and implementing the ASSIST-ME project.
In Switzerland there is a strong and important CPD. Furthermore, in each canton there is a cantonal Institution which is responsible for CPD and has a big budget.

Science education

Competence model
The competence model is not present for primary education and lower secondary and explicit for upper secondary and vocational and technical secondary levels.

The competence model specifies competencies related to IBST in a noticeable way for upper secondary and in a weak way for vocational and technical secondary levels.

STM in the curriculum
Physics, chemistry, earth, technology and biology are taught as an integrated subject in primary education and lower secondary. Mathematics is taught as a separated subject.

STM are taught as separated subjects in upper secondary schools.

Time allocated to math, science and technology teaching:

	Average time at grade 5	Average time at grade 9	Average time at grade 12	Minimum time at grade 12	Maximum time at grade 12
Physics	0.7	1	2	0	4
Chemistry	0.7	1	2	0	4
Earth	0.7	1	2	2	2
Biology	0.7	1	2	0	4
Mathematics	5	6	4	4	7
technology	0	0	0	0	2

Activities mentioned in mathematics, sciences and technology curriculum in primary school or in secondary school (1=yes; 0=no; ND=No data):

	Math		Science		Technology	
	Primary	Secondary	Primary	Secondary	Primary	Secondary
Diagnosing problems	1	1	0	1	0	0
identifying questions	1	1	1	1	0	0
Searching for information	0	1	1	1	0	0
Considering alternative solutions	1	1	0	1	0	0
Creating mental representations	1	1	0	0	0	0
Constructing and using modeling	0	0	0	1	0	0
Formulating hypotheses	0	0	1	1	0	0
Planning investigations	0	0	1	1	0	0
Finding structures	0	0	1	1	0	0
Researching conjectures	ND	ND	ND	ND	ND	ND
collecting and interpreting data	0	0	1	1	0	0
Evaluating results	0	0	0	1	0	0
Using evidence	0	0	1	1	0	0
Searching for alternatives	1	0	0	1	0	0
Debating with peers	1	1	1	1	0	0

Searching for generalizations	1	1	0	1	0	0
Dealing with uncertainty	0	1	0	1	0	0
Constructing prototypes	0	0	0	0	0	0

Words mentioned in mathematics, sciences and technology textbook in primary or secondary school (1=yes; 0=no; ND=No data):

	Math		Science		Technology	
	Primary	Secondary	Primary	Secondary	Primary	Secondary
Diagnosing problems	0	0	1	1	0	0
identifying questions	0	0	1	1	0	0
Searching for information	0	0	1	1	0	0
Considering alternative solutions	1	1	0	0	0	
Creating mental representations	0	0	0	0	0	0
Constructing and using modeling	0	0	1	1	0	0
Formulating hypotheses	1	1	1	1	0	0
Planning investigations			1	1	0	0
Finding structures	1	1	0	0	0	0
Researching conjectures	ND	ND	ND	ND	ND	ND
collecting and interpreting data	0	0	1	1	0	0
Evaluating re-	0	0	1	1	0	0

sults						
Using evidence			1	1	0	0
Searching for alternatives	0	0	0	0	0	0
Debating with peers	0	0	1	1	0	0
Searching for generalizations	0	0	0	0	0	0
Dealing with uncertainty	0	1	0	0	0	0
Constructing prototypes	0	0	0	0	0	0

Resources, part of IBST and practical work
Some IBSTME resources for teachers exist at all levels.

The part of inquiry based methods in science teaching is low for primary and very low for secondary.

The part of practical work is noticeable at primary education and lower secondary and very low at upper secondary and vocational and technical secondary.

Elements that characterize mathematics, science and technology education relevant for testing and implementing the ASSIST-ME project.
1) Technology is integrated in other subjects. 2) IBE is not frequently practiced. 3) Differences between cantons at level of primary and lower secondary education.

Form of student assessment

Day to day assessment
Student's progress is communicated to them mainly by booklets and marks, and sometimes by face-to-face meetings at all levels

Students are very little involved in the assessment of their own performance.

Student's achievement is communicated to their parents using mainly booklets and marks, and sometimes face-to-face meetings at all levels.

There are very few dedicated meetings for helping students and parents to make sense of the assessment information and decide strategies for improving their learning at primary education and lower secondary.

Summative assessment
The programs strongly require summative assessment in math, science and technology.

Teachers are in charge of designing, performing and correcting student's summative assessment.

Some resources exist in order to support the uptake of summative assessment. The consequences of this evaluation on student's career are grade repetition for primary education, and grade repetition and allocation to another pathway for secondary education.

The consequences for student's career are student allocation to a permanent (1 year or more) group featured with respect to his or her strengths and weaknesses, grade repetition and student allocation to another pathway student allocation to a class featured with respect to his or her specific needs for primary education level, student allocation to a permanent (1 year or more) group featured with respect to his or her strengths and weaknesses and student allocation to another pathway student allocation to a class featured with respect to his or her specific needs and grade repetition lower secondary level, and grade repetition and student allocation to another pathway for upper secondary and vocational and technical secondary levels.

Grade repetition is not often practiced.

Elements that characterize student evaluation relevant for testing and implementing the ASSIST-ME project.
1) There is strong academic freedom for teachers. 2) Formative Assessment is not frequently practiced.

UNITED-KINGDOM

System organization and management

Curriculum
A national curriculum exists.

Schools are highly autonomous towards the implementation of the national curriculum.

Teachers are partially autonomous within the schools.

Funding
Schools are highly autonomous towards the financial matters.

Funding is centralized at a national level.

Funding depends totally of students' performances.

Schools are in charge of expenditures and size of the classes.

Examinations expenditures are part of the school's budget.

Teacher management
Schools are in charge of teacher hiring.

Teachers are not civil servants.

Teachers have long term contracts.

Schools and independent agencies are in charge of teacher evaluation. The consequences of this evaluation are: yearly appraisal and threshold for pay when targets met. Targets may lead to PD.

Wages are quite low.

Bursaries of £20,000 to do teacher training for physics and chemistry graduates with 1st class or 2.1 degrees. Good promotion prospects. Low status.

Teacher collaboration
Schools provide time but do not provide structure for teacher collaboration.

Some teachers collaborate.

Teachers and teachers' organizations, students and parents don't play any role in the school decision making process.

Structure of educational system
Students are expected to choose a career track at 16.

Class sizes are very large.

The part of private schools is very high at all level of educational system. Schools, central state authorities, and independent agencies are in charge of monitoring school performances. There is a local targeting of resources with respect to parents' characteristics at all levels excepted at vocational and technical secondary.

School Leaders
The formal role of school leaders is effective in continuous improvement of instruction in most schools but they have no role at all to play in teacher on-going evaluation of pedagogical strengths and weaknesses. On the contrary, they have a quite important role in teacher professional development.

Student performances monitoring by schools
Schools do collect data on student performances in all schools and at all levels.

These data are accessible to teachers in some schools, and not accessible for students nor parents.

Teachers do not have to keep a detailed record of student progress for internal use in some schools.

The types of criteria used for monitoring school performance are: NC levels measured against national average, value added scores and truancy rates.

Elements that characterize the system organization and management relevant for testing and implementing the ASSIST-ME project.
High stakes testing regime and comparison of school results by league tables. Closing of regional science centers this year which have provided quality PD for last 3-5 years. New science curriculum. Demand by government that external exams are made more difficult and by question paper rather than coursework.

Performance indicates what funding and likelihood of inspection. Some schools focus on set groups of learners, typically c?D boundary for 15/16 year olds or NC level 4/5 for 11 year olds so high attaining students not well catered for.

Little teacher autonomy.

Teacher education and Professional development

Teacher pre-service education
The required education level for teachers is 4 years of higher education for primary and secondary education.

The actual education level of teachers is 3 years for primary education and lower secondary and 4 years for upper secondary schools.

The duration of teacher training program is 4 years for primary education, and 1 secondary.

No data available on the amount of ECTS spent on educational courses during teacher education.

Teacher educators are involved in pre-service education with respect to pedagogical competences at primary education level, teacher educators, experienced teachers and researchers at secondary level.

Teacher academic selection process
A competitive examination is not required to enter pre-service teacher training for all levels.

A teaching practicum is required as part of pre-service training for all levels.

A competitive examination is not required to enter the teaching profession.

There is no credential required to start teaching in addition to the education diploma neither to become a fully qualified teacher.

IBST and FA in teacher initial education
The part of Inquiry Based Sciences Teaching (IBST) in teacher initial education is very low at all levels.

IBST appeared between 5 and 15 years ago in teacher initial education at primary education level and more than 15 years ago at secondary level.

FA appeared in teacher initial education lore than 15 years ago at all levels.

CPD
With respect to teacher professional development –particularly in relation to mathematics, science and technology teaching methods– there is some 'light touch' control with an accreditation or 'kite-marking' system having a role to play in quality control of provision and with some obligation for teachers to take part in PD but with responsibility for involvement again being devolved.

In-service teacher education is designed by teacher education departments, experienced teachers and independent providers for all levels.

In-service teacher education is provided by teacher education departments, experienced teachers and independent providers for primary education, and by teacher education departments, experienced teachers, local, regional or central authorities and independent providers for secondary.

Teacher preparation programs are evaluated by local, regional or central authorities for all levels.

IBST and FA in CPD
The part of IBST in CPD programs is low for primary education and noticeable for secondary education.

The part of FA in CPD programs is high at all levels.

IBST appeared between 15 and 5 years ago in CPD programs for primary education and more than 15 years ago for secondary education.

FA appeared between 15 and 5 years ago in CPD programs for all levels.

Age of teacher population
The average age of teachers is 30 years for primary education and 35 years for secondary education.

Elements that characterize teacher education and professional development relevant for testing and implementing the ASSIST-ME project.
Variability in provision and routes for provision. No clear responsibility for evaluation
Preference for short PD programs of twilight, 1 or 2 days. No focus on impact in evaluations or within programs.

Science education

Competence model
The competence model is not present for primary education and lower secondary and implicit for upper secondary level.

The competence model specifies competencies related to IBST in a weak way for upper secondary level.

The competence model does not specify competencies related to FA.

STM in the curriculum
No data about integrated/separated subjects

Time allocated to math, science and technology teaching:

	Average time at grade 5	Average time at grade 9	Average time at grade 12	Minimum time at grade 12	Maximum time at grade 12
Physics	0	1	5	3	6
Chemistry	0	1	5	3	6
Earth	0	0	0	0	0
Biology	0	1	5	3	6
Mathematics	5	5	5	3	6
technology	0	1	5	3	6

Activities mentioned in mathematics, sciences and technology curriculum in primary school or in secondary school (1=yes; 0=no; ND=No data):

	Math		Science		Technology	
	Primary	Secondary	Primary	Secondary	Primary	Secondary
Diagnosing	0	0	0	0	0	0

problems						
identifying questions	0	0	0	0	0	0
Searching for information	0	0	0	0	0	0
Considering alternative solutions	0	0	0	0	0	0
Creating mental representations	0	0	0	0	0	0
Constructing and using modeling	0	0	0	0	0	0
Formulating hypotheses	0	0	0	0	0	0
Planning investigations	0	0	0	0	0	0
Finding structures	0	1	0	0	0	0
Researching conjectures	0	0	0	0	0	0
collecting and interpreting data	0	0	1	1	0	0
Evaluating results	0	0	1	1	0	0
Using evidence	0	0	0	0	0	0
Searching for alternatives	0	0	0	0	0	0
Debating with peers	0	0	0	0	0	0
Searching for generalizations	0	0	0	0	0	0
Dealing with uncertainty	0	0	0	0	0	0
Constructing	0	0	0	0	0	1

prototypes						

Words mentioned in mathematics, sciences and technology textbook in primary or secondary school (1=yes; 0=no; ND=No data):

	Math		Science		Technology	
	Primary	Secondary	Primary	Secondary	Primary	Secondary
Diagnosing problems	0	0	0	0	0	0
identifying questions	0	0	0	0	0	0
Searching for information	0	0	0	0	0	0
Considering alternative solutions	0	0	0	0	0	0
Creating mental representations	0	0	0	0	0	0
Constructing and using modeling	0	0	0	0	0	0
Formulating hypotheses	0	0	0	0	0	0
Planning investigations	0	0	0	0	0	0
Finding structures	0	0	0	0	0	0
Researching conjectures	0	0	0	0	0	0
collecting and interpreting data	0	0	0	0	0	0
Evaluating results	0	0	0	0	0	0
Using evidence	0	0	0	0	0	0
Searching for alternatives	0	0	0	0	0	0

Debating with peers	0	0	0	0	0	0
Searching for generalizations	0	0	0	0	0	0
Dealing with uncertainty	0	0	0	0	0	0
Constructing prototypes	0	0	0	0	0	0

Resources, part of IBST and practical work
No IBSTME resources for teachers exist at any levels.

The part of inquiry based methods in science teaching is very low at all levels.

The part of practical work is very low at all levels.

Elements that characterize mathematics, science and technology education relevant for testing and implementing the ASSIST-ME project.
Lack of skills in new teachers. Exam papers with low practical knowledge demands

Form of student assessment

Day to day assessment
Student's achievement is communicated to their parents using mainly face-to-face meetings and marks at lower secondary and upper secondary levels.

There no dedicated meetings for helping students and parents to make sense of the assessment information and decide strategies for improving their learning at any level.

There are no consequences of this evaluation on student's career.

Summative assessment
No data about programs requirement concerning summative assessment.

Local, regional or central authorities are in charge of designing student's summative assessment. Teachers are in charge of performing and correcting student's summative performance.

Few resources exist in order to support the uptake of summative assessment.

The consequences of this evaluation on student's career are student allocation to a temporary group specifically featured with respect to his or her strengths and weaknesses.

Grade repetition is never practiced.

The ways to cope with students who encounter difficulties are "other".

Elements that characterize student evaluation relevant for testing and implementing the ASSIST-ME project.
Inspectorate expects children to know levels.