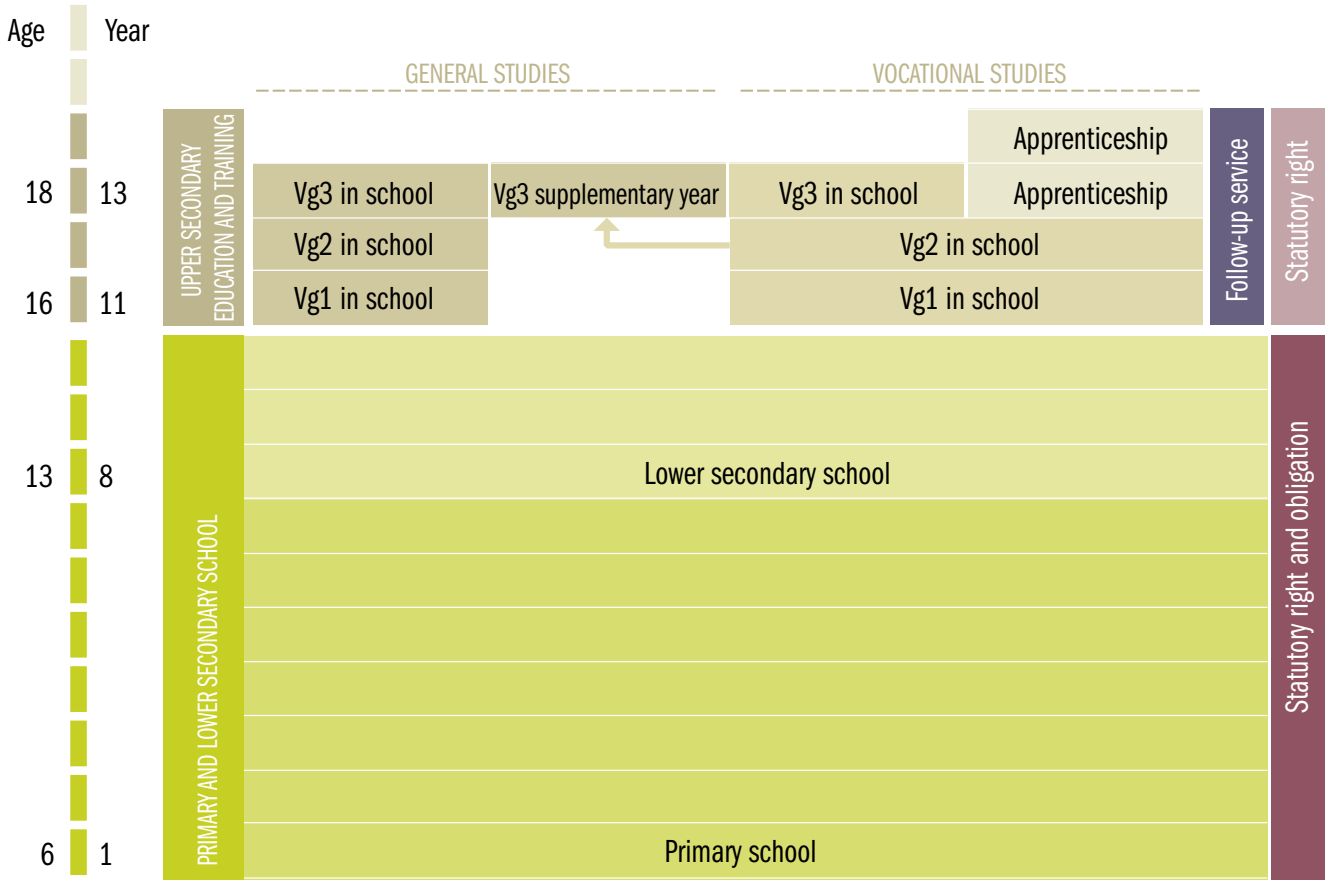
The Norwegian Directorate for Education and Training

The Education Mirror 2009

Analysis of primary and secondary education and training in Norway

Primary and secondary education and training in Norway



First edition / First printing run

ISBN 978-82-486-2000-6

Design, illustration and production: 07 Gruppen AS, Oslo

Foreword

This year's edition of *The Education Mirror* confirms a development that we have followed in recent years, namely a disturbing disparity in learning outcomes between large and small municipalities. The analyses of national tests show that the smallest municipalities have poorer average results in basic skills. This may be related to the fact that some of the small municipalities do not have the expertise and the resources that are required in order to be active school owners.

The Norwegian Directorate for Education and Training attaches importance to helping the municipalities to become active school owners. This will help reduce regional disparities and make it easier for small municipalities to provide a good education. In *Some glimpses into The Education Mirror,* we provide an indication of how the trial scheme with an advisory team of experienced school leaders and school owners is working. Chapter 6 on *Quality improvement*
includes a presentation of the new education programme for head teachers, which has become a popular programme for new school administrators and for school administrators who do not have any formal management training.

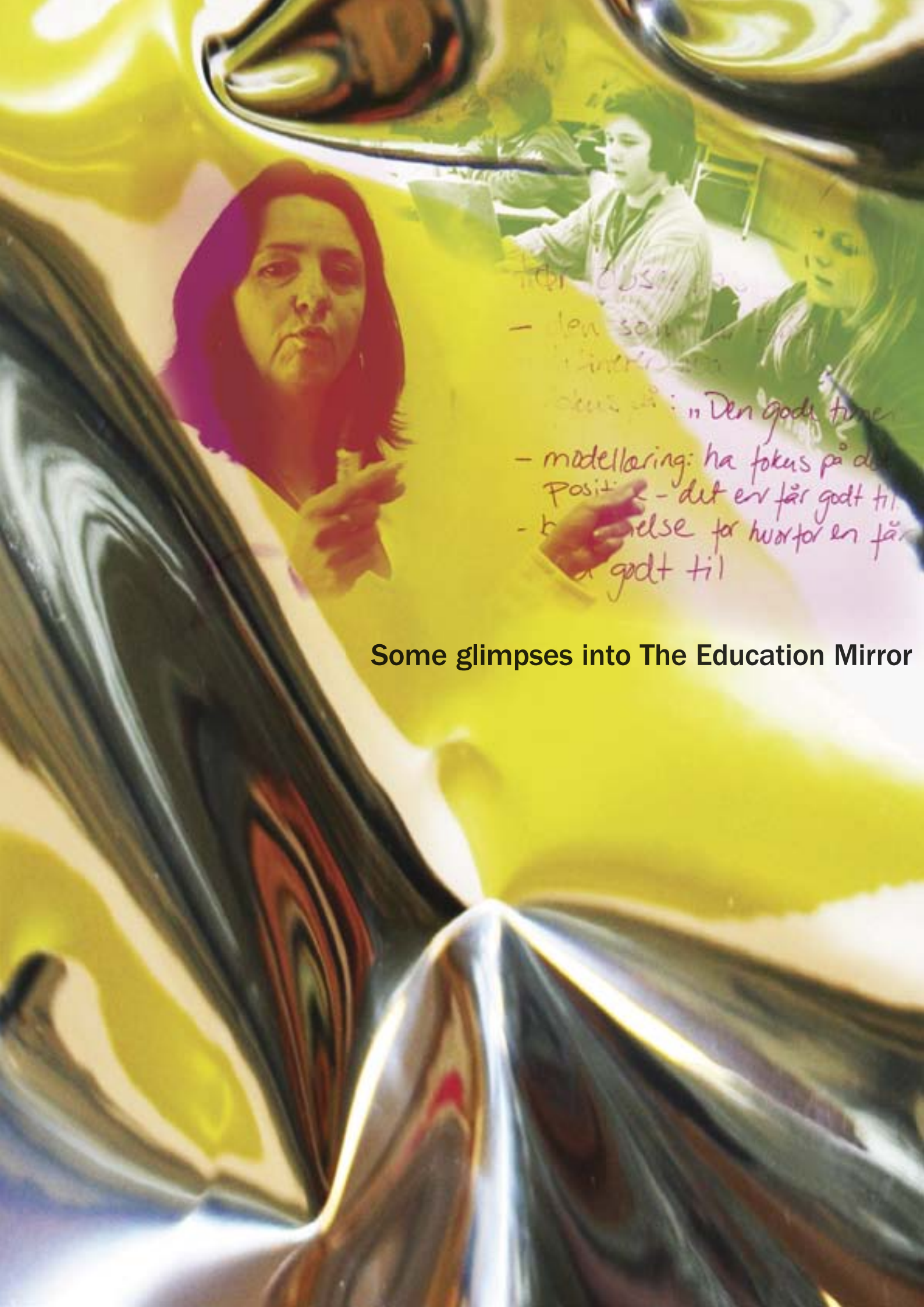
A user survey of school owners and school administrators in the autumn of 2009 shows that *The Education Mirror* is a useful reference work that is well known in the sector. Nevertheless, we are constantly working to improve the publication so that it can become an even better tool for everyone who is working in management, administration and quality improvement in the school system.

Happy reading!

Petter Skarheim

Petter Skarheim

Contents



Some glimpses into The Education Mirror

Advisory team

The establishment of the scheme with an advisory team, which shall help schools and municipalities that face special challenges, is one of many approaches to improve quality in the school system. The measure was announced in Report no. 31 (2007-2008) to the Storting "Quality in the Schools". The Report to the Storting states that the state shall establish an advisory team who shall help schools and school owners that face special challenges to improve.

The scheme was given a trial run under the direction of the Norwegian Directorate for Education and Training in the 2009-2010 school year. The aim of the pilot project was to identify the needs of school owners and schools, define the advisory service and the roles of the advisors, and find an appropriate way of organising the scheme.

- Vest-Agder and Hordaland were selected as pilot counties. The Directorate established six teams of advisors divided among the two counties. Each team was composed of four persons were released by their employers for this task: in most cases a release for a 20 per cent position and in a few cases for only 10 per cent.
- 11 school owners and 17 primary and lower secondary schools were given guidance in the 2009–2010 school year.
- In order to gain experience with more prolonged guidance, the Directorate decided to extend the pilot project for another year for five school owners and seven schools. This activity will be conducted simultaneously with the development of the permanent scheme.
- For training and exchange of experience, the advisors took part in several gatherings of advisors during the trial period. Participating schools and school owners have reported to the Norwegian Directorate for Education and Training two times by answering a questionnaire.
- Experience gained shows that guidance undoubtedly has an impact, but that certain conditions must be met in order to bring about change. According to Terje Kato Stangeland in the Directorate's Department of School Development, one of the most important conditions is the school owner's involvement in and assumption of responsibility for the processes.
- The permanent scheme will cover primary, lower secondary and upper secondary school.

The role of advisor

The Norwegian Directorate for Education and Training has included experts with different expertise in the advisory team. Håvard Lunnan in the Directorate's Department of School Development has this to say about the selection criteria, "In order to ensure quality, the pilot project has recruited advisors who have been recommended to the Directorate from other projects (Knowledge Promotion - from words to action) and from the Lillegården Resource Centre and their network. In addition, the County Education Offices have helped find skilful, experienced school owners and school administrators in the pilot counties."

In Vest-Agder County, the Educational Centre in Kristiansand has two persons in the advisory team, including the administrator. In addition two head teachers from Kristiansand are on the team. All four of the advisors from Kristiansand had 20 per cent positions on the team in the first project period. The advisors work as a team, and they draw on each other's experience and special expertise.

Venke Krogstad Nome, a head teacher in Kristiansand, describes the role of advisor as challenging, educational and competence-building. Nome points out that external advisors will get nowhere if they only come in to assess, criticize and correct. Mutual respect and recognition are completely necessary in order for an advisory team to function. Nome lists the following points when she defines the role:

- An advisor is someone who "works well together with" the person who is to be advised.
- An extra pair of eyes that help people discover new perspectives.
- Someone who asks questions that challenge people to broaden their perspective.
- Someone from outside, with whom the person receiving advice can reflect upon and analyse matters.
- Someone who helps the person who receives advice to find answers and solutions themselves.
- Someone who indicates solutions and who knows where the expertise can be found.
- Someone who provides input and advice when there is a need and a desire for it.

Finding the least common denominator at Nyplass

If you are new as a teacher at Nyplass School, certain general rules of conduct will explain everything from when the pupils are supposed to know their times tables to what the consequences of unacceptable conduct by pupils are. This "Rulebook" is being prepared in the collegium of teachers and should be ready before the external advisors withdraw from the project. At Nyplass that will not occur until a year from now.

Nyplass School in Lindesnes is taking part in the national pilot project where external advisors shall help Norwegian schools to make a more focused effort. Do not be fooled into believing that Nyplass School does not have ambitious goals for the project period when the school's head teacher and the rest of the collegium discuss that they want to come up with a least common denominator. Behind these discussions lie expectations of achieving high, but realistic and well-defined goals. The collegium finds that the external advisors Venke K. Nome and Cecilia M. Johansen gave the school's employees an *egg of Columbus* when they asked them in the start phase of the advisory process to reflect on what should be a least common denominator with regard to organisation, teamwork, handling of pupils, academic content and practices in the classroom.

The systematic efforts suffered

The advisors on the Lindesnes team have divided the main responsibility for the participating schools among themselves. Venke K. Nome, head teacher of a primary school in Kristiansand, shares the main responsibility for Nyplass with Cecilia M. Johansen, an employee at the Educational Centre in Kristiansand. In their encounter with the largest primary school in Lindesnes, the advisors find many good practices and considerable commitment. It is the systematic efforts that suffer under the pressure of financial cutbacks and a large number of pupils with challenging behaviour.

Through the advisory project, systematic efforts have been added to the agenda. Head teacher Kurt Vik aims at achieving an comprehensive plan for the school's activities that "should include a least common denominator for what students in different Years are required to complete. It should be a system independent of any specific person that ensures quality, but that still is so ample that the individual teacher can draw on his/her own interests and resources". That quote is taken from the advisor's log.

External viewpoints provide an opportunity to show what the school is good at and to have this confirmed, says Deputy Head Teacher Eva Øvsthus (at right) with a smile together with contact teacher Morten Kleveland and four happy pupils in Year 6. Ragnhild, Ferdinand, Kamilla and Nina have just each held four separate lectures on energy.

Pupils in Year 5, Ingrid and Maiken (the nearest in the picture) have a working session in their math class, and they enjoy doing decimal arithmetic on a PC so much that they do not loose their concentration even when the head-teacher and advisors are looking over their shoulders.

When the school joined the advisory project in the autumn of 2009 and was supposed to specify its development needs, the employees jointly decided upon three target areas: organisation, reading (Norwegian at the upper primary level) and arithmetic (mathematics at the lower primary level). The staff joined in groups, independent of the level, but depending on what they wanted to work on. The focus groups were able to schedule two hours every other Wednesday for development work. The head teacher and deputy head teacher were responsible for the comprehensive plan.

Continuing the pilot project

The advisors at Nyplass have divided the follow-up of the groups so that Johansen has the Norwegian group and the math group, and Nome has the organisation group and the administrator group.

The three groups set specific sub-goals for the plans that were to be in place by June 2010. The trial period was essentially over then, but Nyplass is one of the seven schools that is continuing the pilot project. That indicates that the school is in the middle of a good development process, and this is also emphasised by the coordinator for the Lindesnes team, Nina Skjeseth.

Three municipalities are taking part in the pilot project with the advisory team in Vest-Agder County. When Vest-Agder was selected as a pilot county, some of the municipalities were sceptical about participating. This scepticism was attributed to a fear that some schools would be criticised as poor. In Lindesnes, the meeting of municipal administrators decided to accept.

"We saw a need for assistance in necessary systematic efforts. We focused on testing. We do not regard ourselves as a particularly poor school, but we also know that we can do better. The challenge is to recognise what we do well." That was how the head of childhood and youth services in Lindesnes, Kai Stoveland, explained the decision to let the municipality's three primary schools take part in the pilot project. The schools themselves were not given an opportunity to influence the decision.

"Here in the school there is a tendency to regard measures that are forced on us with a sceptical attitude. We had our doubts," said head teacher Kurt Vik about the prevailing attitude when the advisors, head teachers and school owner met for the first time in August 2009.

Now there is little doubt about the value of external advisors working side by side with us. Both Stoveland, who is the school owner's representative, and Vik, the school's head teacher, characterise the advisory project as a real bonus. They were both relatively new in their respective jobs, both had been employed for one and a half years as the head of childhood and youth services and head teacher respectively when they received the offer to participate. Both are completely clear about what the "real bonus" has given them as newly hired administrators: moral support and courage, pedagogical inputs and measures for performing systematic efforts . "For me, this came at the right time. The advice helps us to refocus and become better organised," said Kurt Vik.

"Came at the right time"

The effect of external attention

Pupils, teachers and school administrators at Nyplass are proud that they are trying out one of the tools that Minister of Education Kristin Halvorsen calls attention to when she wants to show which measures the Ministry of Education and Research goes in for to increase the quality of the school system.

The school sees the advantage of keeping its doors open to advisors and journalists. External viewpoints on the school do not just provide help in reflecting upon constraints and practices. They also offer an opportunity to show what the school is good at and have that

Team coordinator Nina Skjeseth and head of childhood and youth services Kai Stoveland have regular conversations in order to discuss school development at the municipal level.

"We are the ones Kristin is talking about!"

confirmed. When *The Education Mirror* visited the school, we were given a demonstration of good practices, such as working sessions in mathematics, research on design and technology and oral presentations as a form of social training.

The Directorate for Education and Training's advisory team offers its services to schools and their owners. The scheme must not be confused with the scheme in the TV documentary "Klasse 10 B" (Class 10B), which was broadcast by the Norwegian Broadcasting Corporation last winter. In that series, Norwegian television viewers saw a team of "super teachers" take over the instruction in a lower secondary school class. External advisors do not take over the classroom and the teaching. Nevertheless there is a common denominator: the positive effect of external attention.
"Enthusiasm is increasing," says the head teacher at Nyplass.
The school's focus groups agree. "It is inspiring to have access to the Lindesnes team's expertise and attention. External attention sharpens our desire and will to achieve specific results."

The picture lies when the team coordinator sits at Ida's desk. In contrast to the Norwegian Broadcasting Corporation's documentary "Klasse 10 B" (Class 10 B), coordinator Nina Skjeseth and her team of advisors have not been in direct contact with the pupils during their work.

"This is how we do it at Nyplass"

Nyplass regards itself as an average school even though it scored below the national average in reading and mathematics in the national tests for Year 5 (in English, the school scored slightly above the average). The school has several areas where it is above average. The use of concretisation materials, such as Numicon* and Tooti Kids* are a good example of this. Annual musical projects reveal some of the teamwork that takes place.

Here is advisor Nome's view of the current status.
"The school has many good practices, which should be maintained and developed. As head teacher of a primary school myself, I see many things that inspire me and that I can adopt at my own school. The challenge for Nyplass is to organise the projects in a system with common binding targets. The recipe for success is short and sweet: "This is how we do it at Nyplass!"

The two administrators at the school, head teacher Kurt Vik and Deputy Head Teacher Eva Øvsthus, summarise the situation as follows,
"We have tried to improve our focus, but the work on skills has often been in projects. Now we are focusing more on systems so that we will have clear goals and a comprehensive objective. In these efforts, we have been given specific tips by the advisors. It is more difficult to see new solutions when you are working a busy school day. People who come in from outside the school will see other ways to resolve challenges more clearly than we will ourselves."

It will be a challenge to give priority to the time required for development work.
"We have lost 15 per cent of our resources. We lack a student advisor. That creates a situation where administrative resources are swamped," specifies Vik. As his advisor, Nome thinks this will be a relevant topic to pursue in the upcoming pilot period. In this case, Nome can draw on her own administrative experience as a head teacher.

Rules of conduct shall be helpful

The Directorate for Education and Training has required all of the participants in the pilot project to conduct a status analysis, which shall be the basis for prioritising target areas. For Nyplass, these factors come in the opposite order. Focus areas were designated before the status analysis was ready, but they were in good agreement with the results of the analysis. The staff's choices turned out to be mostly focused on the areas where the status analysis gave a yellow or red light and indicated a need to improve and alter practices.

The head teacher and the rest of the collegium realise that the advisory process has given them a more positive attitude to national tests.
"We have improved our attitude to national tests. They are actually quite a good thing and a good method of testing standards. For the pupils, they are academically important, and we owe it to the pupils to help them improve their mastery of the tests."

The focus groups have already come up with completely specific measures that shall be implemented starting in the 2010-2011 school year. For example, the Norwegian group has not only defined what shall be the acceptable level for reading in various Years, but has also devised a permanent plan for stimulating reading. Two pupils from each Year of the lower primary level shall be given reading instruction for 15 minutes at any given time, which means that the

** Numicon mathematics system*
is a multi-sensory, structured maths programme developed in England. The child shall learn by seeing and feeling the structured image, hearing the connected mathematical language and simultaneously performing hands-on activities.

** Tooti Kids*
is a material that is a breeze to use, you learn through touching it, multi-sensory learning through the experiences it gives you. Tooti was developed by Professor John M. Hansson, a former NASA scientist.

The organisation group is one of three focus groups. From the left: Bent Inge Kastet, Nils Magne Glomsaker, head teacher Kurt Vik, Leif Adolf Vigeland, Deputy Head Teacher Eva Øvsthus, Silje Glomsaker and advisor Venke Nome .

lower primary level will always have eight pupils undergoing reading instruction. All of the groups will receive extra resources to implement this reform. At the upper primary level, there is a permanent project to cultivate a love of reading in Year 5. The Norwegian group has now also developed the content of a permanent love of writing project in Year 6. Likewise, the math group assesses standard requirements for the use of the school's concretisation materials and for practicing the times tables.

For the school, it has been important to put in place a common practice for dealing with violations of the school's rules. The organisation group has worked on common procedures for dealing with unacceptable conduct. Definitions of what is unacceptable conduct and a specification of the consequences of various actions are among the local rules of conduct that make it easier to tackle the teacher role.

The school owners' role

The participants in the national pilot project signed a contract where the school owner was required to be an active motivator in the development work. In Lindesnes, team coordinator Nina Skjeseth, the administrator of the Educational Centre in Kristiansand, has the job of following up the school owner. In practice, that means regular conversations between her as team coordinator and Kai Stoveland, the head of childhood and youth services.

"After all, the school owner has a different mandate. It involves school development at the municipal level. Of course, the two of us talk about quality in the quality assurance work. On the basis of my experience, I focus on various challenges. In short, I try to be there for Kai. I want to believe that this can also help give me courage to make the unpopular decisions," says Skjeseth about her role as an advisor. Skjeseth thinks that it is appropriate to keep in mind who the school

Nyplass school is located in the municipality of Lindesnes, which has three primary schools and one lower secondary school. Nyplass is the largest of the three primary schools. The school stands wall to wall with Lindesnes Lower Secondary School in the municipal administrative centre of Vigeland. The school has 270 pupils with two parallel classes for each year. Each Year is organised into teams that have shared time and/or teamwork for 2 hours and 45 minutes every Wednesday and one hour every Thursday.

Nyplass school was advised by the Lindesnes team, which is one of three teams in Vest-Agder County. In connection with the advisory project, the school has appointed three responsibility groups that each work within their own target area. Nyplass School is one of the seven participating schools that have been given an extended pilot project for another year.

owner is. It is important to remember that the politicians have the ultimate responsibility for the schools in the municipality. The school administration shall assist with its professional expertise.

Lindesnes is facing major challenges because the number of full-time equivalents (FTEs) in the school system has been sharply reduced. The municipality must find other ways to perform its tasks and utilise its expertise.
Stoveland envisions a planning forum, a place where knowledge can be shared among the schools.

"The school owner cannot just leave school development to each individual school. It is important to create a common basis for the schools in the municipality. What shall we expect the pupils to know when they get to the lower secondary school? What competence shall they have when they reach the transition from primary school to lower secondary school?"

For Stoveland, it will be important to generate optimism and involve the politicians. He shall encourage them to make more room for academic content in the municipal academic committee."

"Much of the challenge is to make the people in charge of the schools aware that Lindesnes is working on school development and development work," he says.

Nyplass School is one of the seven schools that have been given an extend pilot project for another year. That means that head teacher Kurt Vik and advisor Venke Nome can continue to exchange experiences with regard to systematic efforts in a busy school day.

In that way, the pilot project has been a boost. In April 2010, the Municipal Committee for Childhood and Youth Services and Cultural Affairs considered a development strategy and objectives. The matter was later considered by the municipal council. Team coordinator Skjeseth and Stoveland attended that meeting in order to inform, answer questions and urge the politicians to become more aware of their role as school owner.

The quality lesson at Søre Neset

The staff shall become better class managers by observing each other's teaching. Søre Neset School has developed a local formula for providing the advice to colleagues. The scheme also involved observation, but the external advisors were in "the back room", not in the classroom.

During the 2009-2010 school year, representatives from the national advisory team followed the efforts to improve the learning environment in Søre Neset School, but they did not physically intervene in the classroom, nor did the external advisors have any influence on the school's selection of focus. However, they were involved in coming up with common standards for *the quality lesson* at Søre Neset School. By the end of the school year, a local formula had been developed for how the school should make use of the advice to colleagues to improve its practices and meet the criteria for the quality lesson.

From the right: Anne Karin Flatlandsmo and Janne Støen have followed Søre Neset School closely throughout the entire 2009-2010 school year. Head Teacher Øystein Holmaas and Deputy Head Teacher Vigdis Vikne have found it to be highly advantageous to be part of a team with external experts and advisors.

Professional sparring

The primary school in the municipality of Os had already begun a process involving class management when it received the offer to participate in the pilot project in June 2009. Head Teacher Øystein Holmaas describes the offer as a golden opportunity to increase the awareness of and inspire all of the staff and to give the school administration a professional sparring partner. The concrete result of the project year was a self-developed model for competence building: *Reflection Guide.*

For the school on the Bergen peninsula, class management is included in a systematic effort to improve the learning environment and common profile. When she is asked for an appropriate example, the coordinator for the Midthordland team, Inger Sekse, mentions Søre Neset as a school that has made considerable progress in the development work.

The teachers shall show each other something they master well.

On the team of advisors, Anne Karin Flatlandsmo, Deputy Head Teacher at Voss Lower Secondary School, had the main responsibility for Søre Neset. She worked together with Janne Støen from the Lillegården Resource Centre. Both emphasise that the administration at Søre Neset School was coordinated and focused. As external advisors, they were given clear requests: competence and structure in their advice to colleagues.

"The administrators were clear about what they wanted from us. They do not need any advice about their aims. The school administration has clear aims and is good at rapidly incorporating things into its system. They wanted someone from outside the school to keep an eye on them, someone with whom they could discuss their ideas."

Difficult balance

Head Teacher Øystein Holmaas and Deputy Head Teacher Vigdis Vikne are members of the school's planning group together with the team leader for the lower primary level and the team leader for the upper primary level.

"The systematic efforts actually began with an employee survey in 2009. Some of the results of that survey were a desire for more time for pedagogical reflection and time to share experiences and to develop a common culture, e.g. by creating good common experiences," says the Deputy Head Teacher about the background for the

*ART (Aggression Replacement Training): ART is a training programme developed in the USA, but now extensively used in Norway. ART is based on a social learning theory. The goal of ART is to increase the pupils' social competence through systematic training of social skills, anger control and moral reasoning.

Anne Karin Flatlandsmo (left) and Janne Støen were given clear requests when they came in as external advisors: competence and structure in their advice to colleagues.

ongoing development work, where the school has been result-oriented. Measures such as training ART-instructors* and assembly programmes for the whole school according to a regular schedule with a group of technicians and good stage equipment were quickly implemented.

"With such focused efforts, Søre Neset may seem like an idealised school. What benefit does the school gain from participating in the advisory project when the planning work appears to be "on course"?

"We agreed to participate because we regarded this as a unique opportunity to quality assure our work, and we do not regret it. The advice was an opportunity to gain support and encouragement for what we do," replies Head Teacher Holmaas.

Janne Støen in her function as secretary during the process. How shall the observation in the classroom be carried out?

The administration at Søre Neset does not deny that the school is facing its challenges. The school's results on the national tests for Year 5 have been well under the national average. The school has a relatively large group of pupils that face special challenges.

"We have had challenges in maintaining the balance between the focus on the individual and the focus on the organisation. In the long run it has been demanding to take care of the interests of individual pupils and the school as a system," add the two administrators.

"Here the administration has managed to maintain the balance between carrying out the day-to-day tasks and simultaneously looking ahead and evolving," extol the advisors.

"The project year resulted in a self-developed model for competence building. The name is Reflection Guide."

The governing idea

Since January 2009, class management has been on the agenda in the shared time as well as in planning days.

"We wanted an area that is relevant to everyone, where everyone has something to contribute and something to learn. No one can neglect class management, and the gains from systematic efforts benefit everyone. There have also been central government guidelines on class management and the learning environment," explains the administration of its choice of topic.

The foundation was laid when the external advisors came into the picture in the autumn of 2009. Their work could be based on the external assessment of class management that was made by the

Head Teacher Øystein Holmaas has seen how external advisors inspire and influence the work process in a collegium, including himself.

They want to generate reflection about what occurs in the classroom. Now team leader Ann Elisabeth Husa and Deputy Head Teacher Vigdis Vikne think that the school has found a functional tool to help perform that task.

assessment group in the Midthordland district in the spring semester. In the assessment report, the teachers note, *"Little collective time for reflection. Too much time spent on disciplinary problems. We need to improve our class management skills.*

Common sessions during the project period have ensured competence and inspiration. In September, Pål Roland from the Centre for Behavioural Research in Stavanger talked about class management. In February, Hanne Jahnsen from Lillegården Resource Centre lectured on Den ene dagen (The One Day), about how an alternative to regular instruction, a few hours or one day each week, can seem motivating. Alternative school in the school (Asis) is one of the measures that Søre Neset utilises. The school also uses ART*. The school has trained two ART instructors and is making efforts to implement a joint social learning plan for the whole school.

The lucid teacher

The advisors have referred to research and knowledge about what promotes a good learning environment and what does not have any effect. "Measures for pupils who have difficulty cooperating must be adapted to each individual's situation, but we know what is NOT a good idea."

About the teacher's authority they say,
"You have to be a lucid teacher whose authority is evident to everyone, but if you are merely authoritarian you do not have a chance in the world. Everything must be based on relationships."

The staff work in groups in order to specify what the employees think shall be good classroom practices. On the basis of the group work, Anne Karin Flatlandsmo of the advisor group drew up the form, *The quality lesson at Søre Neset School.*

Interview guide

Descriptions of teacher authority, class manager style and the schedule for the period for training social competence are included in the new social learning plan. The completed plan was first presented to the staff and then to the parents, and it will finally be made available to the public on the school's website starting in the autumn of 2010 as a replacement for the current social learning plan from 2002.

The social learning plan contains an interview guide for holding pupil interviews, and the school has earmarked a room for this purpose. The last thing that was put in place was a tool for giving advice to colleagues. The school administration wanted a reflection guide that was patterned on the guide for pupil interviews. The aim was to develop a permanent structure for the observation of colleagues in the classroom. The school administration imagined permanent groups that sit in on each other's classes at different levels.

Reflection Guide

The planning group used the advisors as sparring partners in order to assess the composition of reflection groups, to determine what should be observed and to determine what preliminary and supplementary work must be done in order for the observation to recharge batteries and have meaning.

When The Education Mirror visited the school in March, the planning group and advisors discussed the content of and plan for the observation in the classroom. The educators in the planning group want to have a start-up where colleagues can show each other something they master well, e.g. transitions and structure, but they are aware that an undesirable consequence of model learning may be that colleagues become too passive and praise each other without it leading to any improvement.

In April, the template was ready. The whole package includes *the Guide for Reflection Groups*, the form *the quality lesson in Søre Neset School*, the observation form and the composition of the groups. The reflection groups will be given an hour for preliminary work (mandatory meeting time in scheduled time). The group sets up

The quality lesson at Søre Neset

Emotional support (person/relation)

PRAISE
- Clear praise increases the pupils' self-esteem, gives them a feeling of coping, encourages them
- Avoid ritual praise
- General praise, give collective positive feedback, help promote a good, inclusive class environment
- Give praise for good conduct, praise the things you would like to have more of
- Teach the pupils to give each other positive feedback

POSITIVE ATTITUDE
- Meet the pupils with expectations of positive behaviour
- Show that they can help turn something that is negative into the opposite; what can you do in this situation?
- Clear body language, be genuine
- Praise them when they are honest
- Stick to your word, do not say A if you cannot say B

RESPECT SECURITY AND INCREASE TRUST
- We show the pupils respect when we take them seriously
- Conscious use of eye contact, be courteous, a handshake creates good relations
- Recognise pupils who have emotional difficulties; let them know that you notice them. Give them time out

BE OBJECTIVE
- Distinguish between the person and the act

Organisation (teacher/pupil)

CLASS RULES
- Regular evaluation of class rules
- Formulate rules positively ("believe we are good at it!) encourage well-being and learning

PREPARATION
- You must come well-prepared for the class; you must acquire new academic and methodological knowledge and be inquisitive
- Have clear ideas beforehand about which method you will choose and why

THE TEACHING SITUATION
- The teacher comes to class on time
- Greet the pupils and shake their hands in the morning
- Get the pupils to calm down and sit in their seats
- Have a clear plan for the class; goals and content
- Have orderly classes; not too many tasks (you must have time to achieve your express goal)
- Give clear, specific instructions, one at a time
- Show enthusiasm and creativity; find good solutions when you encounter pupils who are unmotivated in the teaching situation
- Help promote mastery and variation; be aware of each pupil's needs – individual plans and tests
- Teach the pupils to deal with variation
- Base the teaching on the various learning styles
- Summarise at the end of the class; let the pupils offer feedback

TRANSITIONAL ROUTINES
- In general: How to hand out and/or gather in books. Tidying routines for pupils and teachers. Routines for those who do not find and/or forget equipment
- New class: How to put things away and/or get them out again.
- Change of activity: from group work to individual work – signal from the teacher?
- Individual pupils: Those who need extra help and support – how do we do it?

LESSONS
- Fixed routines for lessons: Same subject on a particular day of the week, predictability
- The lessons must be corrected

Learning support (person/subject)

PRAISE
- Specific academic praise with regard to anything well-done combined with feed forward gives the pupils security and awareness of their own acquisition of knowledge and/or progress
- Convey positive academic expectations through language and body language; we will accomplish this together; I shall help you understand it
- Give a pat on the shoulder; encourage

DAILY PLAN/WORK PLAN
- Include the topic in addition to the subject
- Write down the goal for the class on the blackboard; what they are going to learn
- Formulate the goal as specifically and simply as possible; realistic goals (What are the characteristics of a noun?) put a certain amount of pressure on the pupils with regard to the lesson: "We work best under pressure"
- Summary of the class: Have we learned what we were supposed to learn? Preferably with spoken words

FEEDBACK
- Follow up the pupil in the learning efforts; provide regular feedback
- Check whether the goal and/or goals have been achieved; written weekly test or by means of oral questions

INDIVIDUAL PUPILS:
- The pupils who do not achieve the class's goals are given individual goals. They also have adapted weekly plans

The advisors alternately met the school administration, the planning group and the whole collegium.

a schedule, and the participants take turns choosing a topic they are comfortable with. The actual observation occurs during a teaching hour, where the observers stayed focused on a defined topic and take notes on an observation form. In the same way as with the preliminary work, the reflection groups are given an hour for the supplementary work. In the supplementary work, they use the guide that was prepared for reflection work, and the observation is logged.

Testing in May

In general meetings throughout the spring, the staff discussed the model and attitudes to and roles of being an observer. In May, the model was tested. The test group consisted of the teachers in the planning group and a representative from each of the reflection groups that was formed. The person who has been trained in the method shall be the resource person for the group in the ongoing work. For Søre Neset, the goal is that all of the staff be involved in the work by the autumn of 2010.

The external advisors follow the reflection work "to the door" by being present and taking on the task of administering the testing. For the school administration, it was important that the testing occurred in the spring while they still had contact with the advisors and that the project had a specific result.

"We drew on the advisors' expertise so that we broadened our competence. That made us feel secure. It was a good thing that they followed us through the whole learning process. The advisors' participation affected the work process in the collegium in a very positive way." That is how the head teacher and deputy head teacher summarise the advantage of having external follow-up throughout a whole school year.

Eva Udnes Nordbye

Søre Neset School is one of 11 primary and lower secondary schools in the municipality of Os. The primary school has 204 pupils. The lower primary level has only one class for each Year. In Year 5, pupils from Halhjem barnetun (a combined kindergarten and primary school with Years 1-4 and with day care facilities for school children), so that the school has two parallel classes in the upper primary level. Søre Neset is organised in such a way that those who work at the lower primary level and those at the upper primary level form two separate teams. The leaders of the two teams form a planning group together with the head teacher and the deputy head teacher.

The primary school in the municipality of Os is one of the nine schools that have taken part in the pilot project in Hordaland County. In the advisory project, Hordaland has been divided into three teams: Sunnhordland, Midthordland and Ytre Midthordland (the southern, central and coastal districts of the county respectively). Søre Neset belongs to the Midthordland district.

The Midthordland team is responsible for three municipalities, each of which has one school in the project. The team consists of four persons: three who have a 20 per cent position and a team coordinator in a 10 per cent position. The team is organised so that two advisors share responsibility for each school, with one of them having the main responsibility. Team coordinator Inger Sekse is in charge of the coordination and is the main contact person for the school owners.

1 Facts about primary and secondary education and training

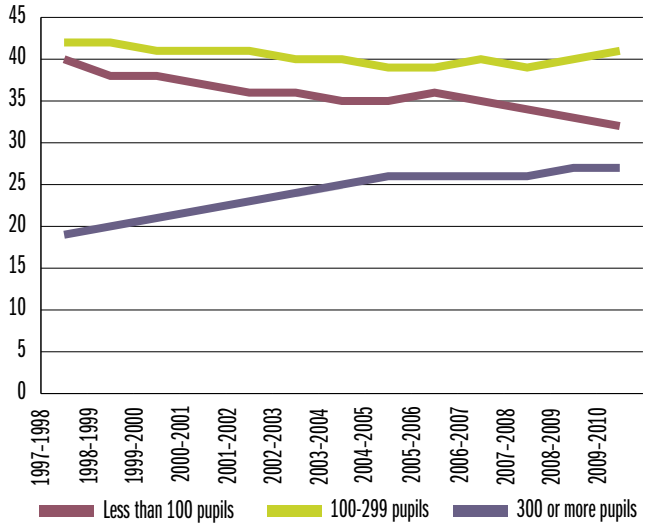
Primary and secondary education and training in Norway consists of primary and lower secondary school and upper secondary education and training.

Primary and lower secondary school provides a ten-year education and is divided into primary school and lower secondary school. Primary school includes Years 1-7, and the lower secondary school includes Years 8-10. Year The pupils begin primary school in the calendar year when they turn six. Upper secondary education and training comprises all qualifying education between lower secondary school and higher education. Upper secondary education has twelve education programmes: three programmes for general studies and nine vocational. According to the Knowledge Promotion Reform 2006 (KL06), the levels in upper secondary education and training are termed Vg1 (upper secondary level 1), Vg2 (upper secondary level 2) and Vg3 (upper secondary level 3).

Objectives and principles for primary and secondary education and training are set out in the Knowledge Promotion curriculum (LK06), which covers both primary and lower secondary school and upper secondary education and training. This curriculum has been introduced at all levels of primary and secondary education and training starting in the 2008–2009 school year.

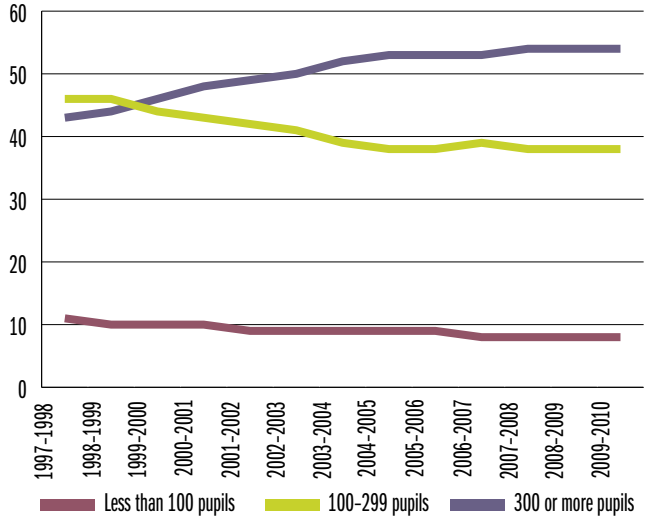
This chapter presents statistics that give an overall picture of the status of primary and secondary education and training in Norway. The chapter includes information on the school struc-

Figure 1.1: Distribution of small, medium-sized and large mainstream primary and lower secondary schools, 1997–1998 to 2009–2010. Per cent.



Source: The Primary and Lower Secondary School Information System (GSI)

Figure 1.2: Distribution of pupils in small, medium-sized and large mainstream primary and lower secondary schools, 1997–1998 to 2009–2010. Per cent.



Source: The Primary and Lower Secondary School Information System (GSI)

ture, on the number of pupils, on the distribution of pupils in various education programmes and various subjects in upper secondary education and training, on apprentices, on special needs education, on the level of education in the population, and on teachers and leaders in primary and secondary education and training.

1.1 School structure

Primary and lower secondary schools

In the autumn of 2009, there were 2,997 mainstream primary and lower secondary schools and 84 special schools. 2,837 of the mainstream primary and lower secondary schools were municipal, three were intermunicipal, one was state-administered and 156 were private. Among the special schools, 46 were municipal, eight were intermunicipal, 19 were county-administered, five were state-administered and six were private.

Figure 1.1 presents an overview of the percentage of small, medium-sized and large mainstream primary and lower secondary schools. There are fewer and fewer primary and lower secondary schools with less than 100 pupils, and there are more and more schools with more than 300 pupils. In the autumn of 2009, 32 per cent of the schools had less than 100 pupils, whereas 27 per cent had more than 300 pupils.

In accordance with this development, figure 1.2 shows that the percentage of pupils attending large schools is increasing, while the percentage attending small and medium-sized schools is decreasing. However, this trend has levelled off somewhat in recent years. In the 2009-2010 school year, 54 per cent of the pupils attended schools with more than 300 pupils, while only eight per cent attended schools with fewer than 100 pupils. By comparison, in the 1997-1998 school year, 43 per cent of the pupils attended schools with more than 300 pupils. Since the 2002-2003 school year, more than half of the pupils have been attending large schools.

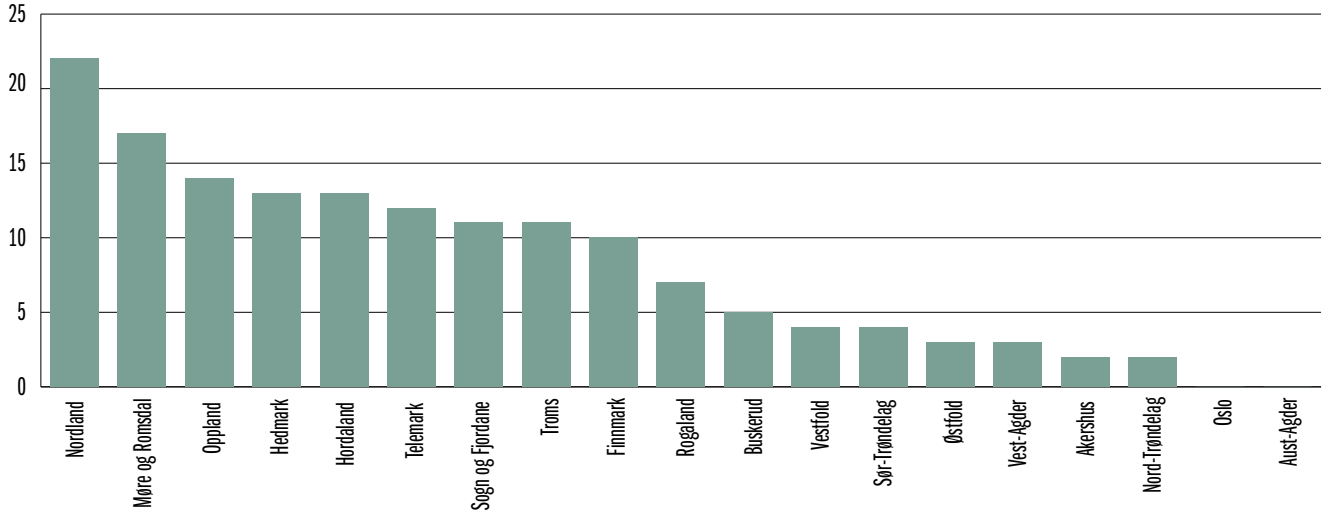
Closed down and opened primary and lower secondary schools

From the 2008-2009 to the 2009-2010 school year, 76 mainstream primary and lower secondary schools were closed. 73 of these were municipal and three were private. At the same time, 14 mainstream primary and lower secondary schools were opened, nine of which were municipal and five private. One new special school was also opened and three special schools were closed.

In the spring of 2010, the Norwegian Directorate for Education and Training conducted a survey of school closings. Figure 1.3 shows the number of school closings by county. In the period from 2007-2008 to 2009-2010, 154 primary and lower secondary schools were closed. Nordland and Møre og Romsdal are the counties where the most primary and lower secondary schools were closed: 22 and 17 respectively. In Oslo and Aust-Agder, there were no actual closings of mainstream primary and lower secondary schools.

Figure 1.4 shows the breakdown by county of the number of pupils who have been affected by school closings. A total of about 6,000 pupils were affected by closings. Oppland is the county where the most pupils have been affected by school closings: a total of 815 pupils. In Telemark and Hedmark, 689 pupils and 660 pupils respectively were affected by school closings.

Figure 1.3: School closings in the period from 2007-2008 to 2009-2010. By county. Number.



Source: The Norwegian Directorate for Education and Training

Reasons for school closings

The low number of pupils, a poor municipal economy and a desire to improve resource utilisation are listed as the main reasons why schools are closing. Often, it is a combination of a poor municipal economy and a low number of pupils.

Too few pupils is listed as the reason for about 60 per cent of the closings, and the municipal economy is listed in about half of the cases. In most of the cases where the municipal economy is listed as a reason, it is in combination with too few pupils.

In Telemark and Vestfold counties, the municipal economy is listed as a reason in over one fourth of the school closings. In Oppland and Rogaland counties, the municipal economy is listed as a reason in less than one third of the cases. In Nord-Trøndelag, Vestfold, Hedmark, Nordland, Finnmark and Sogn og Fjordane counties, the low number of pupils is listed as the main reason for the school closings. Problems recruiting qualified teachers is listed in about 12 per cent of these cases.

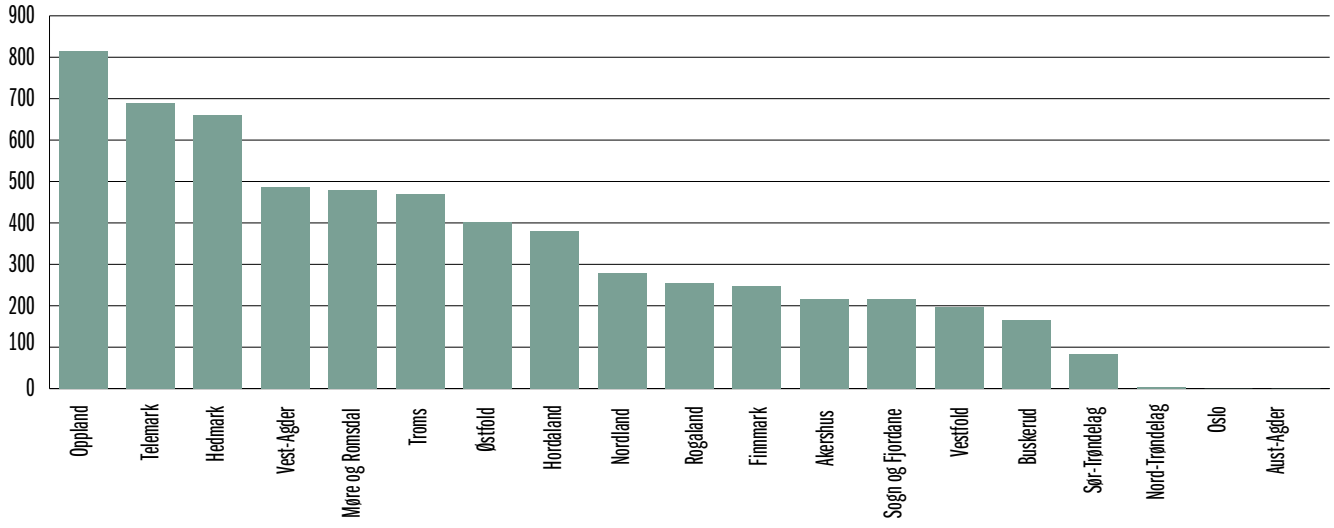
Other reasons for school closings are deteriorating and unsuitable school buildings, unsatisfactory educational programmes and an inflexible learning and work environment. In some cases it was an initiative from parents that resulted in the school being closed.

Where have the pupils been moved?

Figure 1.5 shows a percentage distribution of the type of school to which the pupils were moved after the school they attended was closed. 66 per cent of the pupils were moved to merged or existing schools, 30 per cent were moved to new public schools and four per cent were moved to new private schools. Only in Møre og Romsdal, Hordaland and Nordland counties were new private schools established during this period.

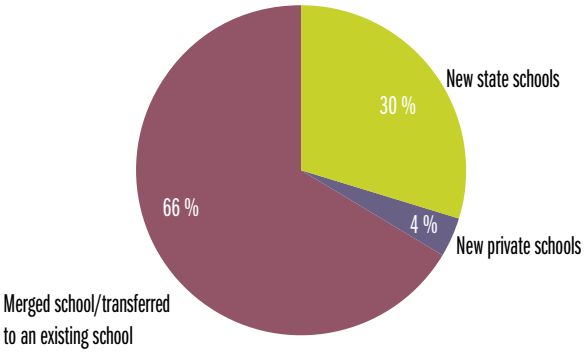
About 250 pupils have to travel more than 20 km to school as a result of the school they attended being closed. This pertains to pupils in Nordland, Hedmark, Oppland, Buskerud, Rogaland, Hordaland, Sogn og Fjordane, Møre og Romsdal, Sør-Trøndelag and Troms counties.

Figure 1.4: Pupils who were affected by school closings in the period from 2007-2008 to 2009-2010. By county. Number.



Source: The Norwegian Directorate for Education and Training

Figure 1.5: Breakdown by where pupils were transferred after a school closing in the period from 2007-2008 to 2009-2010. Per cent.



Source: The Norwegian Directorate for Education and Training

Upper secondary schools

In the autumn of 2009, there were 439 upper secondary schools in Norway, 355 of which were county-administered, 82 private and two state-administered (Statistics Norway, preliminary figures for 2009).

Since 2001, the number of upper secondary schools in Norway has decreased by 58. From the 2008-2009 to the 2009-2010 school year, 16 upper secondary schools were closed, eight of which were county-administered, one state-administered and seven private. In the same period, four county-administered and four private upper secondary schools were established.

Private primary and secondary schools

In the 2009-2010 school year, there were 157 private primary and lower secondary schools that were approved in accordance with the Private Education Act and which thereby were entitled to state funding. Six of these schools were special schools. There were two more mainstream private primary and lower secondary schools approved in accordance with the Private Education Act than in the previous year. In addition to schools approved in accordance with the Private Education Act, five private primary and lower secondary schools that are not entitled to state funding were approved in accordance with Section 2-12 of the Education Act in the autumn of 2009. The number of private primary and lower secondary schools increased rapidly from 2000-2001 (89 private schools) to 2005-2006 (150 private schools). Since 2005-2006, the increase in the number of private primary and lower secondary schools has levelled off. The increase in private primary and lower secondary schools from the 2001-2002 to the 2009-2010 school year was 76 per cent.

The percentage of private schools increased significantly in the past decade. In the autumn of 2000, less than three per cent of all primary and lower secondary schools were private, whereas in the autumn of 2009 the percentage of private schools had increased to a little over five per cent. The increase in the percentage of private primary and lower secondary schools does not merely reflect that there have been more private schools during the last decade, but also that on the whole there has been a decrease of over 500 primary and lower secondary schools, most of which were public. Even though the percentage of private schools has increased, only 2.6 per cent of the primary and lower secondary school pupils went to private schools in the autumn of 2009. On the average, the number of pupils in private schools is lower than the number of pupils in public schools. In recent years, a number of new private primary and lower secondary schools have been established in rural areas. These schools are often small and have few pupils. Thus, as a result of the trend in school structure in the past decade, the percentage of private schools is higher than the percentage of pupils that attend private schools.

In the autumn of 2009, 82 private upper secondary schools were registered, which is two schools less than in the previous year (Statistics Norway, preliminary figures in 2009).

Private primary and secondary schools

Private schools are privately owned schools approved pursuant to the Act relating to state grants to private schools offering primary and secondary education (the Private Education Act) or Sections 2-12 and 3-12 of the Act relating to primary and secondary education (the Education Act).

Private schools approved pursuant to the Private Education Act receive subsidies from the state corresponding to 85 per cent of operating expenses in public schools. Schools must be run in accordance with the Private Education Act, regulations pursuant to this act and decisions of approval. The schools shall perform their activities on the following basis: religious, approved educational alternative, international, specially adapted upper secondary education and training in combination with top-level sports, Norwegian primary and secondary education and training abroad or specially adapted education and training for disabled persons.

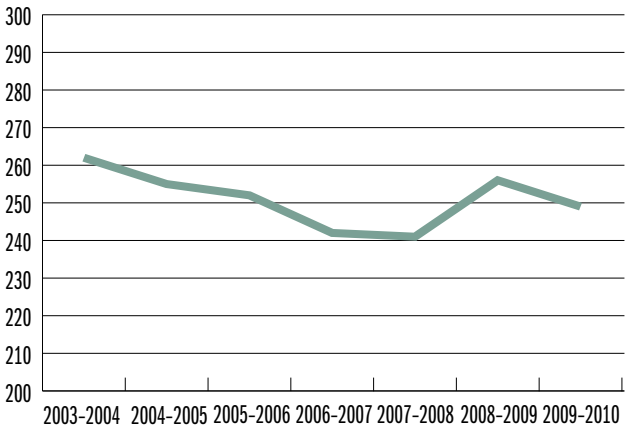
The requirements concerning a special basis do not apply, however, to already approved schools that were in operation by year-end 2007.

An approval as a private school approved pursuant to Sections 2-12 or 3-12 of the Education Act does not result in subsidies from the state.

Adult education institutions

According to the Section 4A-1 of the Education Act, adults have the right to education at the primary and lower secondary school level. The right to education usually includes the subjects that are needed in order to receive a diploma for completed primary and secondary

Figure 1.6: Adult education institutions, 2003–2004 to 2009–2010. Number.



Source: The Primary and Lower Secondary School Information System (GSI)

education and training. The education shall be adapted to individual needs.

In the 2009-2010 school year, 249 adult education institutions provided primary and secondary education and training to adults. That was seven less than in the previous year. Not all municipalities have their own adult education institutions, but the reason for this may be that they do not have enough inhabitants who need the programme. Many municipalities also participate in intermunicipal cooperation on primary and secondary education and training for adults.

1.2 Pupils and apprentices in primary and secondary education and training

Pupils in primary and lower secondary school

Section 2-1 of the Act relating to primary and secondary education (the Education Act): Right and obligation to attend primary and lower secondary education

Children and young people are obliged to attend primary and lower secondary education and have the right to a public primary and lower secondary education in accordance with this Act and regulations pursuant to the Act. The obligation may be met by means of publicly maintained primary and lower secondary schools or by means of other equivalent education.

As per 1 October 2009, there were 615,927 pupils in Norwegian primary and lower secondary schools, 613,928 of which attended state or private mainstream primary and lower secondary schools, which is 105 pupils less than in the previous year. Figure 1.7 shows how the number of pupils in mainstream primary and lower secondary schools increased up to the 2005-2006 school year before decreasing during the next three years and levelling off at present. Starting in the 2008-2009 school year, there was an increase in the number of pupils in Year 1, Year 4 and Year 5 of primary school and in the whole lower secondary school. The increase was greatest in Year 1.

In the autumn of 2009, there were 1,929 registered pupils in special schools and 838 pupils in Norwegian primary and lower secondary schools abroad. Another 70 pupils were registered who were not associated with any particular school, but who were given education organised by the municipality.

Pupils in upper secondary education and training

Section 3-1 of the Act relating to primary and secondary education (the Education Act): Right to upper secondary education and training for young people

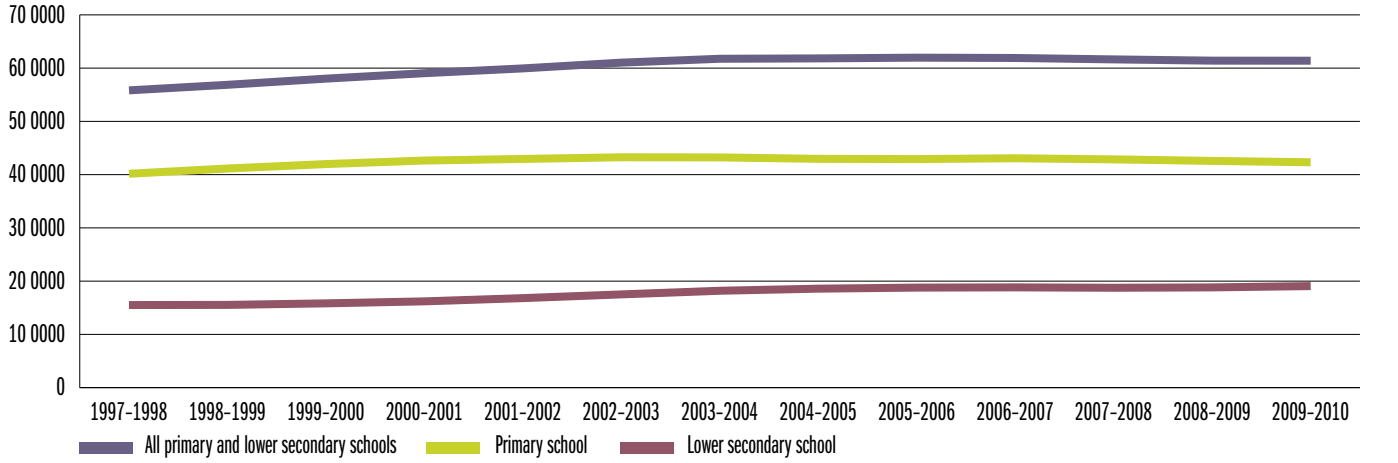
Young people who have completed primary and lower secondary education or the equivalent have, on application, the right to three years' full-time upper secondary education and training. In subjects where the curriculum requires a period of instruction that is longer than three years, such young people have the right to education in accordance with the period of instruction determined in the subject curriculum.

Pupils, apprentices and training candidates have the right to education and training in accordance with this Act and regulations issued pursuant to the Act.

Young people who have completed primary and lower secondary school or the equivalent have the right to three years' continuous upper secondary education and training. In some subjects the period of instruction is longer than three years. In such cases, the right is extended to the period of instruction determined for that subject. This right is often called *the youth right* and must normally be claimed during a continuous period of five years, or six years if the training is provided at a training establishment. In addition, the right must be fully claimed before the end of the year in which the person concerned turns 24 (Section 3-1 of the Norwegian Education Act).

Preliminary figures from KOSTRA (Municipality-State Reporting) 2009 show that around 91 per cent of all 16–18-year-olds claimed

Figure 1.7: Trend in the number of pupils in the period from 1997–1998 to 2009–2010 for mainstream primary and lower secondary schools. Mainstream primary and lower secondary schools. Number.



Source: The Primary and Lower Secondary School Information System (GSI)

Table 1.1: Distribution of pupils by education programme and level in upper secondary education and training, 2005–2006 to 2009–2010. Revised data. Number.

	First year/Vg1		VKI/Vg2		VKII / Vg3				
	General studies	Vocational	General studies	Vocational	General studies	Vocational	Total	Alternative education and training	Upper Sec. Ed. altogether
2009-2010	32 772	38 620	30 558	34 963	44 674	5 905	187 492	3 336	190 828
2008-2009	33 359	38 821	30 236	33 812	41 345	5 947	183 520	3 301	186 821
2007-2008	34 318	39 071	29 683	33 871	41 067	10 187	188 197	2 667	190 864
2006-2007	34 061	39 483	29 068	35 165	39 381	10 501	187 659	2 072	189 731
2005-2006	32 378	41 911	26 709	34 626	36 371	9 805	181 800	0	181 800

Source: Statistics Norway

this right and took part in upper secondary education and training during the autumn of 2009. In addition, cf. chapter 5 on Recruitment, completion and competence achievement in upper secondary education and training.

In the autumn of 2009, there were 190,828 pupils in upper secondary education and training, 3,336 of which received alternative education and training. These are pupils who have an individual decision with an individual education plan and who are not placed in one of the twelve mainstream education programmes. Table 1.1 shows that there was a decline in the number of pupils from 2008-2009 to 2009-2010 for level 1 (Vg1), whereas there was an increase for levels 2 and 3 (Vg2 and Vg3). 46 per cent of the pupils who began in the first level of upper secondary education and training in the autumn of 2009 began in a general studies education programme. Table 1.1 shows that the number of pupils who choose a general studies education programme is increasing in Vg3. One reason for this is that many pupils in vocational education programmes choose to take a supplementary year qualifying for higher education after Vg2. The number of pupils in vocational education programmes decreased considerably from Vg2 to Vg3 because most of the pupils in vocational studies either begin as apprentices or go over to a supplementary year qualifying for higher education after having completed Vg2. The number of pupils who took vocational studies in Vg3 dropped sharply after the introduction of the Knowledge Promotion Reform at the Vg3 level in the 2008-2009 school year. This is partly attributed to structural changes related to the introduction of the reform, e.g. the merging of *assistant nursing studies* and *care worker studies* into the new subject *health and social care worker studies.*

Table 1.2: Pupils in upper secondary education and training as per 1 October 2009, by education programme. Non-revised figures. Number.

	Vg1	Vg2	Vg3
All programmes	73 423	65 957	50 933
Sports and Physical Education	3 956	3 542	3 789
Music, Dance and Drama	2 361	1 975	1 962
Supplementary year qualifying for higher education			11 674
Specialisation in General Studies	26 404	24 581	26 394
Building and Construction	4 942	4 790	191
Design, Arts and Crafts	3 331	2 262	364
Electricity and Electronics	4 804	4 042	1 040
Health and Social Care	8 039	7 789	966
Media and Communication	3 605	3 160	2 173
Agriculture, Fishing and Forestry	1 687	1 469	913
Restaurant and Food Processing	2 522	2 059	35
Service and Transport	3 195	3 902	203
Technical and Industrial Production	6 767	5 707	370
Alternative education and training	1 810	679	859

Source: The Norwegian Directorate for Education and Training/Statistics Norway

Pupils choice of subjects in upper secondary education and training

Table 1.2 shows that in the 2009-2010 school year the most pupils in Vg1 were enrolled in the education programme for *Specialisation in General Studies* (26,404), and a total of 45 per cent of the pupils were enrolled in one of the general studies education programmes (pupils in alternative education and training are not included in the calculation). Among the vocational education programmes, the most pupils were enrolled in *health and social care studies and technical* and *industrial production*.

In Vg2 as well, the most pupils were enrolled in *Specialisation in General Studies*, and 46 per cent were enrolled in general studies education programmes (pupils in alternative education and training were not included in the calculation). In 2009-2010, the lowest number of pupils were enrolled in the education programmes *agriculture, fishing and forestry* (1,469 pupils), *music, dance and drama* (1,975) and *restaurant and food processing* (2,059).

In Vg3, 26,394 pupils were enrolled in *Specialisation in General Studies*. In addition, 11,674 pupils took a supplementary year qualifying for higher education. 86 per cent of the pupils who attend Vg3 in school are enrolled in general studies programmes (those taking a supplementary year are included in these figures; pupils in alternative education and training are not included). In two vocational education programmes, *media and communication* and *agriculture, fishing and forestry*, the pupils can qualify for higher education. Thus, it is natural that these education programmes have a relatively high percentage of pupils in Vg3 compared with the number of pupils in Vg2.

Table 1.3: Programme areas in upper secondary level 2 Health and Social Care. Number and per cent.

	2007-2008		2008-2009		2009-2010	
	Number	Per cent	Number	Per cent	Number	Per cent
Ambulance service	157	2	189	3	187	3
Child care and youth work	2503	40	2557	37	2416	37
Pedicure and orthopaedics	79	1	94	1	142	2
Health work	2538	40	2963	43	2821	43
Health service	737	12	762	11	653	10
Skin care	311	5	310	5	323	5
Total	6325	100	6875	100	6542	100

Source: The Norwegian Directorate for Education and Training/Statistics Norway

Compared with 2008-2009, there was an increase in the number of pupils in Vg3 for all vocational education programmes (a supplementary year is not included in the calculation). The biggest increases in Vg3 from 2008-2009 to 2009-2010 were in the education programmes *electricity and electronics* (198 pupils), *technical and industrial production* (153 pupils) and *health and social care* (140 pupils). One possible explanation may be that it has become more difficult to get an apprenticeship and that the counties have established Vg3 as an alternative. For more information about applying and the number of pupils broken down by education programme, cf. chapter 5.

Programme areas in the vocational education programmes in Vg2

In the vocational education programmes, the possibilities for selection of programme subjects is limited because all pupils must take the common core programme subjects that apply to the programme area they have chosen in Vg2 (The Norwegian Directorate for Education and Training, 2009a). Therefore, as a general rule, selection of programme subjects in vocational studies shall not be discussed here - merely the selection of programme areas. Only pupils in Vg2 are included in these figures. For a more detailed description of vocational education and training, cf. chapter 5.

There is considerable variation in the number of pupils among the various programme areas in vocational studies. *Health and social care* was the largest vocational education programme measured by the number of pupils in Vg2 in the 2009–2010 school year. Table 1.3 shows that in Vg2 *health and social care* in 2009–2010 the greatest number of pupils were in the programme areas *health work* and *child care and youth work.*

The programme areas with the most pupils in Vg2, regardless of the education programme, are *media and communication* (3,060 pupils), *construction techniques* (3,058 pupils), *health work* (2,821 pupils), *child care and youth work* (2,416 pupils) and *electrical power* (2,235 pupils).

Programme areas in general studies education programmes in Vg2

Table 1.4 shows that of the 23,253 pupils who were registered in education programmes for *Specialisation in General Studies* in Vg2, the largest number of pupils were enrolled in the programme area for *languages, social sciences and economics studies* – more than half of them. Arts, crafts and design studies had a continued decline in the number of pupils in 2009 and was the smallest programme area. In the same period, there has been a decline in the number of pupils in the education programme for *design, arts and crafts*. Some counties point out that after the division of the former area of study for arts, crafts and design studies, the decline in the number of pupils may be attributed to the difficulty of maintaining the offer of *Specialisation in General Studies in arts, crafts and design studies* in many different locations. Pupils who are interested in arts, crafts and design, but have not made up their mind whether they want to take *Specialisation in General Studies* at the end, find *design, arts and crafts* to be too narrow, and hence they do not select this programme area (Høst and Evensen 2009).

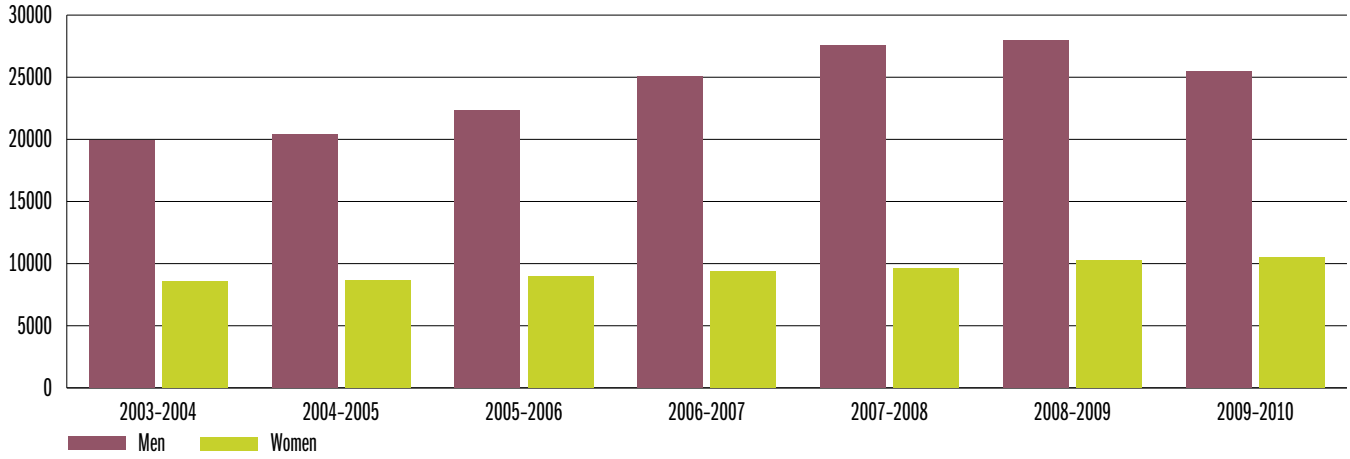
We do not have any comparable figures for 2007-2008 because the programme areas *languages, social sciences* and *economics studies* were merged into one programme area in that year. For the same reason, percentages were not calculated for the programme areas this year.

Table 1.4: Programme areas for Specialisation in General Studies, upper secondary level 2. Number and per cent.

	2007-2008		2008-2009		2009-2010	
	Number	Per cent	Number	Per cent	Number	Per cent
Arts, Crafts and Design Studies	1190	.	1070	5	949	4
Natural science and mathematics	9261	.	9 575	41	9 422	41
Languages, social sciences and economics studies	..	.	12 687	54	12 882	55
Total	.	.	23 332	100	23 253	100

Source: The Norwegian Directorate for Education and Training/Statistics Norway

Figure 1.8: Apprentices and new apprentices by gender. 2003 to 2009. Number. Revised data.



Source: Statistics Norway

The education programme for *music, dance and drama* has one common core programme area in Vg1 and is divided into three programme areas in Vg2 and Vg3: a programme area for *music*, a program area for dance and a program area for drama. *Music* has the most pupils of the three programme areas, with 1,158 pupils in 2009-2010.

The education programme for *sports and physical education* is not divided into programme areas in Vg2 and Vg3, so the selection of programme areas for this subject is not discussed.

Programme subjects for Specialisation in General Studies

As a general rule, the pupils in the programme areas for *natural science and mathematics* and for *languages*, *social sciences and economics studies* shall have two programme subjects from each of two subject areas in their own programme area (in-depth study). In addition, the pupils shall have at least two programme subjects from the general studies education programmes. That means that the number of pupils in each subject does not just consist of pupils from their own programme area, but also from all of the general studies education programmes. The three largest programme subjects in the programme area for language, *social sciences and economics studies*, measured by the number of pupils in the 2009-2010 school year, are *sociology and social anthropology* (10,751 pupils), *international English* (10,196) and *law* 1 (5,792). The three largest programme subjects in the natural sciences and mathematics are *mathematics* R1 (8,210 pupils), *physics* 1 (7,538) and *chemistry* 1 (7,143).

Apprentices in upper secondary education and training

As per 1 October 2009, 36,011 apprentices and 1,240 training candidates were registered in upper secondary education and training (Statistics Norway). The number of apprentices declined by about six per cent from the previous year. Figure 1.8 presents an overview of the number of apprentices as per 1 October for the years 2003 to 2009. Here we see that the number of apprentices in upper secondary education and training increased in the period 2003 to 2008, but then decreased in 2009. There is a definite majority of men among the apprentices, and the decline in the number of apprentices from 2008 to 2009 was mainly in the male-dominated vocational subjects, especially construction and building (Statistics Norway, 2010a). Chapter 5 gives a broader overview of apprentices in upper secondary education and training.

1.3 Special needs education

Primary and lower secondary school

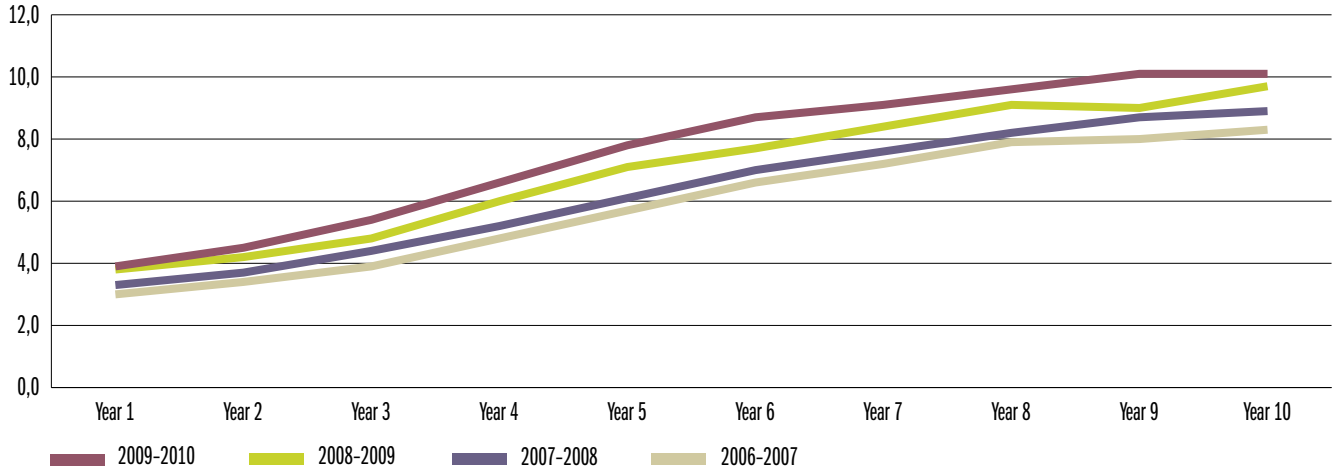
According to Section 5-1 of the Education Act and Section 3-6 of the Private Education Act, pupils who either do not benefit satisfactorily from ordinary teaching have the right to special needs education (SNE). In addition to 1,929 pupils in special schools, 46,873 of the pupils in mainstream primary and lower secondary schools had individual decisions on SNE in the autumn of 2009. Altogether this amounts to a percentage of 7.9 per cent of all pupils at mainstream primary and lower secondary schools and special schools. Table 1.5 shows that 7.6 per cent of all pupils in mainstream primary and lower secondary school had individual decisions on SNE, which is an increase of 8.6 per cent from the 2008-2009 school year. Nearly 70 per cent of the pupils who receive SNE are boys. The gender gap in the percentage of pupils who receive SNE has been stable since 2006-2007.

Table 1.5: Pupils with individual decisions on special needs education by gender, in the period 2006-2007 to 2009-2010. Mainstream primary and lower secondary schools. Number and per cent.

	Pupils with special needs education			Pupils with special needs education by gender	
	All pupils	Special needs education		Girls	Boys
School year	Number	Number	Per cent	Per cent	Per cent
2009-2010	613 928	46 873	7.6	31.2	68.8
2008-2009	614 033	43 164	7.0	30.8	69.2
2007-2008	616 388	39 028	6.3	30.8	69.2
2006-2007	619 038	36 669	5.9	30.7	69.3

Source: The Primary and Lower Secondary School Information System (GSI)

Figure 1.9: Pupils with individual decisions on special needs education by Year and gender in the period 2006-2007 to 2009-2010. Mainstream primary and lower secondary schools. Per cent.



Source: The Primary and Lower Secondary School Information System (GSI)

Figure 1.9 shows the percentage of pupils in mainstream primary and lower secondary schools with individual decisions on SNE, broken down by Year. The percentage of pupils with SNE increases during primary school and throughout lower secondary school. In the autumn of 2009, 3.9 percent of the pupils in the Year 1 at mainstream primary and lower secondary schools had individual decisions on SNE, whereas in Year 10 the percentage of pupils with SNE was about 10 per cent. The figure also shows that for all Years there has been an increase in the percentage of pupils with SNE in the period from 2006-2007 to 2009-2010.

95 per cent of the pupils in mainstream primary and lower secondary school who have individual decisions on SNE, receive SNE from teaching staff. Half of these pupils have periods with SNE taught by an assistant. Only a few have individual decisions that only include periods taught by an assistant. One per cent of the pupils in mainstream primary and lower secondary schools who have individual decisions pursuant to Section 5-1 of the Education Act and Section 3-6 of the Private Education Act have individual decisions without any periods of instruction. This may entail extra teaching aids, physical facilitation, etc. In addition, cf. chapter 2 on resources for SNE.

Right to special needs education:

When it shall be assessed which education and training programmes shall be offered to a pupil who has a right to special needs education, it is important to make a comprehensive assessment. The various aspects of the education and training must be assessed and studied in order to clarify what must be done in order for a pupil to be able to get an adequate outcome from the education. The following aspects of the education and training ought to be assessed:

- The goals for the education and training: shall the pupil have education and training in all of the competence goals in the Knowledge Promotion curriculum?
- The content of the education and training: what kind of content shall the pupil have in his/her education and training?
- Framework factors: is there a need to make special arrangements with regard to extra teacher resources, assistants, extra teaching aids and one-to-one teaching? Need for special expertise for the person who is in charge of special needs education?
- The pupil's skills and aptitudes: is there a need for facilitation because of functional disabilities, dyslexia or illness?
- Work methods: does the pupil have a need for work methods that have been specially adapted? More practical training? One-to-one teaching?

Source: The Norwegian Directorate for Education and Training 2009e

1.4 Language minorities

According to Section 2-8 of the Education Act, pupils in primary and lower secondary school who have a mother tongue other than Norwegian or Sami have the right to adapted education in Norwegian until they are sufficiently proficient in Norwegian to follow the normal instruction in the school. In the autumn of 2009, 41,674 pupils received adapted education in Norwegian, and 4,210 had separate teaching groups for language minorities. If necessary, these pupils also have the right to mother tongue instruction and/or bilingual subject teaching. In the autumn of 2009, there were 3,218 pupils who received mother tongue instruction, 11,037 pupils who received bilingual subject teaching and 5,897 pupils who received both mother tongue instruction and bilingual subject teaching. The dominant languages among pupils who received mother tongue instruction and/or bilingual subject teaching and training were Somali, Urdu and Arabic. Pursuant to Section 2-8, paragraph 3 of the Education Act, if mother tongue instruction or bilingual subject teaching cannot be given by the school's own teaching staff, the municipality shall arrange some other education and training adapted to the pupil's situation to the extent that this is possible. In the autumn of 2009, 2,289 pupils received specially adapted education and training on this basis.

Sections 2-8 and 3-12 of the Act relating to primary and secondary education: Adapted language education for pupils from language minorities

Pupils attending the primary and lower secondary school and/or upper secondary education and training who have a mother tongue other than Norwegian or Sami have the right to adapted education in Norwegian until they are sufficiently proficient in Norwegian to follow the normal instruction of the school. If necessary, such pupils are also entitled to mother tongue instruction, bilingual subject teaching, or both.

The mother tongue instruction may be provided at a school other than that normally attended by the pupil.

When mother tongue instruction and bilingual subject teaching cannot be provided by suitable teaching staff, the municipality and/or county shall as far as possible provide for other instruction adapted to the pupils' abilities.

The municipality and/or county shall survey the pupils' proficiency in Norwegian before any decisions are made about adapted language education. This survey shall also be conducted during the instruction for pupils who are given adapted language education in accordance with the regulations, as a basis for assessing whether the pupils have sufficient proficiency in Norwegian to follow the normal instruction in the school.

Table 1.6 makes it clear that in the 2009-2010 school year one out of five upper secondary schools had a percentage of pupils with an immigrant background of more than 10 per cent. In 36 schools, i.e. eight per cent of all schools, over 20 per cent of the pupils had an immigrant background. There is great variation among counties. In Oslo, more than 10 per cent of the pupils had an immigrant background in three fourths of the schools, and in Østfold county and in Telemark county, the same was true of 42 per cent and 41 per cent of the schools respectively. In Oslo, more than 20 per cent of the pupils had an immigrant background in about half of the schools. The corresponding figures in Buskerud and Akershus counties were five per cent and four per cent respectively. In the 2009-2010 school year, there were eight upper secondary schools in Oslo where over half of the pupils had an immigrant background, seven of which were county-administered and one private (Statistics Norway). In six of these upper secondary schools, over 60 per cent of the pupils had an immigrant background, and in two of the schools, over 80 per cent of the pupils had an immigrant background.

1.5 Language of choice

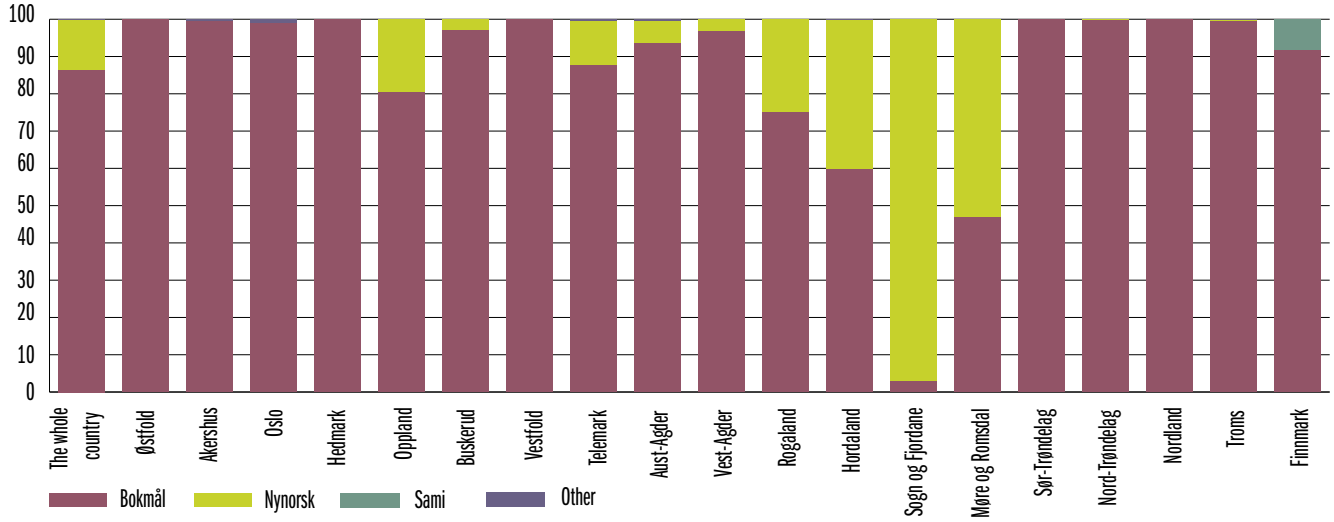
A clear majority of the pupils in primary and lower secondary school, around 86 per cent, received their schooling in Bokmål (Dano-Norwegian, one of the two official forms of the Norwegian language) in the autumn of 2009. The percentage of pupils taught in Bokmål has

Table 1.6: Number of county and private upper secondary schools that have more than 10 or 20 per cent pupils with an immigrant background as per 1 October 2009. Preliminary figures.

County	Number of schools	Number of schools with more than 10 per cent immigrants	Percentage of schools with more than 10 per cent immigrants	Number of schools with more than 20 per cent immigrants	Percentage of schools with more than 20 per cent immigrants
The whole country	461	93	20	36	8
Oslo	40	29	73	21	53
Østfold	19	8	42	0	0
Telemark	17	7	41	0	0
Buskerud	19	7	37	5	26
Akershus	36	13	36	4	11
Hedmark	20	4	20	1	5
Vest-Agder	22	4	18	2	9
Aust-Agder	12	2	17	0	0
Vestfold	14	2	14	0	0
Rogaland	43	6	14	1	2
Finnmark	10	1	10	0	0
Sør-Trøndelag	31	3	10	0	0
Hordaland	56	5	9	2	4
Nord-Trøndelag	19	1	5	0	0
Troms	20	1	5	0	0
Sogn og Fjordane	15	0	0	0	0
Oppland	17	0	0	0	0
Nordland	22	0	0	0	0
Møre og Romsdal	28	0	0	0	0
Not stated	1	0	0	0	0

Source: The Norwegian Directorate for Education and Training/Statistics Norway

Figure 1.10: Percentage of pupils in mainstream primary and lower secondary school with Bokmål or Nynorsk as first-choice form of Norwegian or Sami or some other language as a first language, by county 2009-2010. Per cent.



Source: The Primary and Lower Secondary School Information System (GSI)

increased by just over 2 percentage points over the past ten years. Thirteen per cent of pupils were taught in Nynorsk (New Norwegian, the other official form of the Norwegian language) in the autumn of 2009. Figure 1.10 shows that the county with the largest percentage of Nynorsk was Sogn og Fjordane, where 97 per cent of the pupils had Nynorsk as their first-choice form of Norwegian. The counties of Møre og Romsdal and Sogn og Fjordane are the only two counties where a majority of pupils have Nynorsk as the teaching language. In the county of Finnmark, around eight per cent of the pupils are taught in the Sami language. A small percentage of pupils, including those at foreign schools operating in Norway, receive their education and training in other languages. In Oslo, 1.2 per cent of the pupils received their education and training in other languages.

Section 4A-1 of the Act relating to primary and secondary education (the Education Act): The right to primary and lower secondary education for adults

Persons above compulsory school age who require primary and lower secondary education have the right to such education unless they have the right to upper secondary education and training pursuant to section 3-1. The right to education normally includes the subjects required for the certificate of completed primary and lower secondary education for adults. The education shall be adapted to individual needs.

1.6 Adults in primary and secondary education and training

Adults in primary and lower secondary school

In the autumn of 2009, 4,100 adults attended mainstream primary and lower secondary education and training, cf. table 1.7. In addition, 5,402 adults received primary and lower secondary education and training in the form of special needs education (SNE). Table 1.7 shows that the total number of adults in primary and lower secondary education and training has increased somewhat in the past year after having decreased slightly in the period from 2003-2004 to 2008-2009. The percentage of adults from a language minority who receive primary and lower secondary education and training has increased in recent years. In 2003, 24 per cent of the adult participants were from

Table 1.7: Distribution of adults in various types of primary and lower secondary education and training for language minorities and women, 2003–2004 to 2009–2010. Number and per cent.

	Mainstream teaching			Special needs education			Total		
Year	Pupils	Per cent language minorities	Per cent women	Number of pupils	Per cent language minorities	Per cent women	Number of pupils	Per cent language minorities	Per cent women
2009-2010	4100	81.1	52.0	5402	9.3	47.8	9502	40.3	49.6
2008-2009	3879	73.4	57.6	5479	8.4	47.6	9358	35.3	51.7
2007-2008	4128	69.7	59.3	5610	7.1	47.8	9738	33.6	52.7
2006-2007	4268	72.8	58.0	6352	5.6	47.1	10620	32.6	51.5
2005-2006	4363	71.9	57.0	6575	5.5	47.1	10938	32.0	51.0
2004-2005	4471	62.4	57.4	6486	4.6	45.9	10957	28.2	50.6
2003-2004	4208	55.9	56.1	6967	4.4	47.0	11175	23.8	50.4

Source: The Primary and Lower Secondary School Information System (GSI)

a language minority. In 2009, 40 percent of all the adult participants were from a language minority.

81 per cent of the adults receiving mainstream instruction were from a language minority, but only nine per cent of the adults receiving SNE were from a language minority. In other words, various groups receive primary and lower secondary education and training for adults. Among those who receive mainstream primary and lower secondary education and training, a large percentage are from a language minority. In the group of adults who receive special needs education, the percentage from a language minority is lower.

The gender differences have been somewhat reduced during the past year, so there are relatively small gender differences among those who take part in adult education. A little over half of those who receive mainstream instruction are women. On the other hand, more men than women receive SNE.

Adults in upper secondary education and training

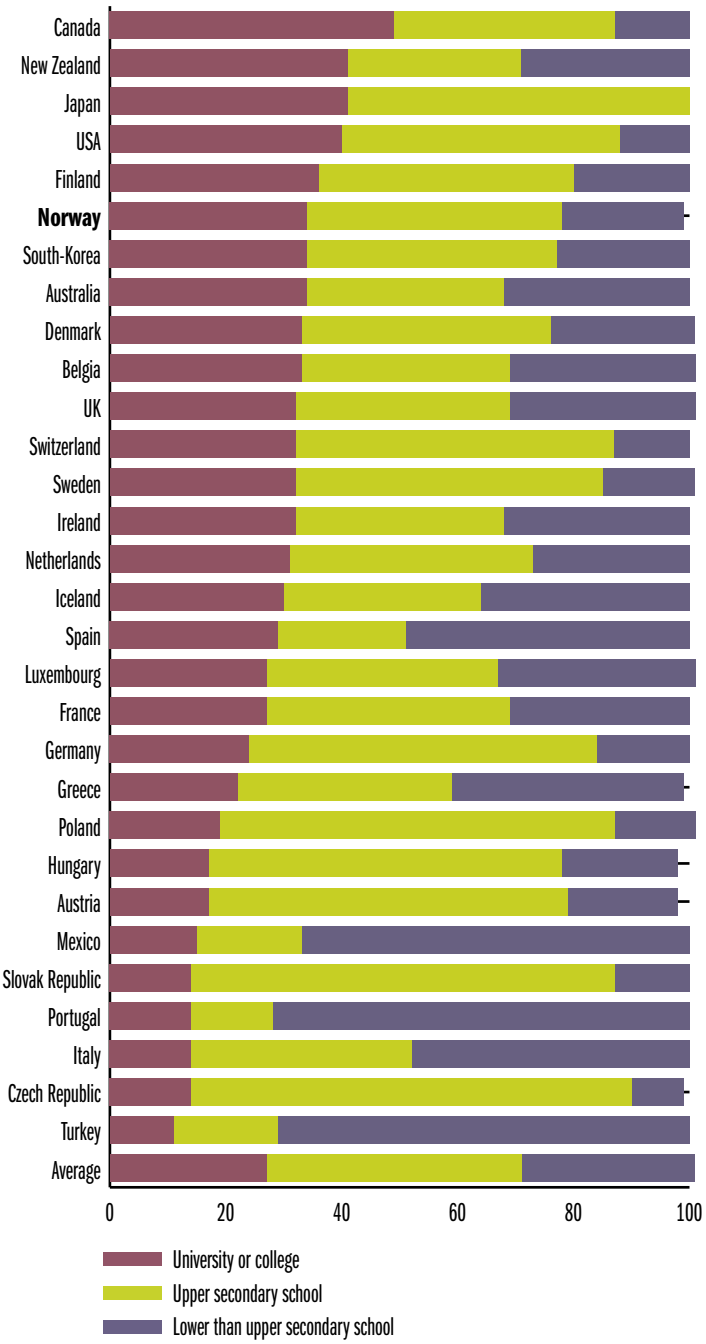
Pursuant to Section 4A-3 of the Norwegian Education Act, adults who have completed primary and lower secondary school, but not upper secondary education and training or the equivalent, have the right to free upper secondary education and training. Until 1 August 2008, this right concerned adults born before 1978, but starting in the autumn of 2008 this was changed to apply to adults from the year they turn 25. The education and training shall be adapted to individual needs. There are three options open to adults who want to complete upper secondary education and training. First, they may apply for regular admission, competing on equal terms with all applicants. Second, they may apply for individual admission based on assessed non-formal competence. This entails an application directly to the county authorities and not through the general admission service to upper secondary education and training. In this alternative, the instruction is often condensed, and as a result of the assessment of non-formal competence, the education and training can also be given in a condensed form. The third option is to turn to private course providers (Vox 2006). Most of the education is given at the upper secondary schools. Adult learning associations do not normally arrange such courses for adults.

Due to changes in the database and uncertainty about its quality, figures have not been published for adults in upper secondary education and training.

1.7 Level of education in the population

Education at a Glance (OECD 2009a) shows that Norway has a high level of education compared with other OECD countries. Figure 1.11 shows that in 2007 Norway was ranked sixth among the OECD countries according to the percentage of the population between ages 26 and 64 with a higher education. In Norway, 34 per cent of the population in the age group 26-64 had a higher education. By comparison, the OECD average was 27 per cent. The percentage of the population for whom an upper secondary education was their highest level of education was 44 per cent for both Norway and the OECD average, whereas the percentage for whom

Figure 1.11: Highest level of education in the population of OECD countries in the 25-64 age group. 2007. Per cent.



Source: OECD 2009a

a primary and lower secondary education was the highest level of education was 21 per cent in Norway and 30 per cent for the OECD average.

Table 1.8 shows that 77.9 per cent of the women and 74.3 per cent of the men in the 30-39 age group have completed upper secondary education and training. Completed upper secondary education and training is defined as completed three-year or four-year upper secondary educations (Statistics Norway, 2006); i.e. those who have completed VKII (Advance course II) and/or Vg3 (upper secondary level 3) or have passed a craft examination. Those who have completed a shorter upper secondary education are defined as having a primary and lower secondary education. Table 1.8 also shows that the level of education varies among men and women of

Table 1.8: Highest level of education in the population. Persons aged 16 and older by level of education, gender and age in 2008. Per cent.

Women

Age	Primary and lower secondary school	Upper secondary school	University and college, lower level	University and college, higher level	Not stated or no completed education	All
All	29.0	39.5	22.6	4.7	4.2	193 0376
age 16-19	83.0	14.4	0.0	0.0	2.6	124 209
age 20-24	24.6	48.7	20.0	0.4	6.3	143 492
age 25-29	16.1	28.0	36.1	7.9	11.9	148 011
age 30-39	14.4	33.3	34.8	9.8	7.7	332 717
age 40-49	22.8	38.1	28.9	6.5	3.7	334 064
age 50-59	20.0	48.9	24.5	4.6	2.0	299 254
age 60-66	25.7	51.8	18.0	3.1	1.4	187 478
age 67 and over	46.1	42.0	9.4	1.2	1.3	361 151

Men

Age	Primary and lower secondary school	Upper secondary school	University and college, lower level	University and college, higher level	Not stated or no completed education	All
age 16-19	87.9	9.2	0.0	0.0	2.8	131 521
age 20-24	35.0	49.3	10.3	0.2	5.1	149 780
age 25-29	22.9	38.1	21.2	7.0	10.8	152 722
age 30-39	16.4	42.4	21.6	10.3	9.3	347 053
age 40-49	22.4	44.4	18.7	8.9	5.6	353 511
age 50-59	18.9	50.4	18.4	9.3	3.0	309 198
age 60-66	22.3	49.9	16.8	9.6	1.4	189 246
age 67 and over	35.3	45.5	11.1	6.8	1.3	264 367

Source: Statistics Norway

different age groups. Among women, those in age groups 25 to 29 and 30 to 39 have the highest level of education. In these groups, around 44 per cent have a higher education. Among men in the same age groups, around 30 per cent have a higher education. Not unexpectedly, the level of education declines in the older age groups for both women and men. Among women, there is a higher percentage who have a lower university or college degree, but more men than women have higher university or college degrees.

1.8 Teachers, leaders and assistants

Teachers, leaders and assistants in primary and lower secondary school

Table 1.9 presents a breakdown of the number of assistants, teachers and leaders in municipal and county-administered primary and lower secondary schools, by qualifications and gender. The figures contain information about all employees, including those who only have a second job in the school system. In the autumn of 2008, there were 66,522 teachers in primary and lower secondary school, and 84 per cent of them had a lower university or college degree with teacher training. 3.5 per cent of the teachers had a higher university or college degree with teacher training; 5.3 per cent had a university or college degree without teacher training and seven per cent had only completed upper secondary school or less without teacher training. 74 per cent of the teachers in primary and lower secondary school were women. The gender difference was less pronounced among leaders in primary and lower secondary school, with 55 per cent women. 88.1 per cent of the leaders had a lower university or college degree with teacher training and 5.7 per cent had a higher university or college degree with teacher training. 6.2 per cent of the leaders in primary and lower secondary school did not have teacher training. In the autumn of 2009, there were also 12,356 assistants in primary and lower secondary school, and 85 per cent of them were women. 17.7 per cent of the female and six per cent of the male assistants had degrees as child and youth welfare workers.

Table 1.9: Teachers, leaders and assistants in primary and lower secondary school by qualifications and gender. Fourth quarter 2008. Per cent.

Teachers	Total	Men	Women
Total number of teachers	66 522	17 343	49 179
Higher university or college degree with teacher training	3.5	4.9	3.0
Higher university or college degree without teacher training	0.9	1.5	0.7
Lower university or college degree with teacher training	84.1	80.3	85.5
Lower university or college degree without teacher training	4.4	6.0	3.9
Upper secondary or lower without teacher training	7.0	7.4	6.9
Leaders	**Total**	**Men**	**Women**
Total number of leaders	5 020	2 238	2 782
Higher university or college degree with teacher training	5.7	6.3	5.2
Lower university or college degree with teacher training	88.1	87.1	88.9
Leaders who do not have teacher training	6.2	6.6	5.9
Assistants	**Total**	**Men**	**Women**
Total number of assistants	13 634	2 024	11 592
Child and youth welfare worker	16.0	6	17.7

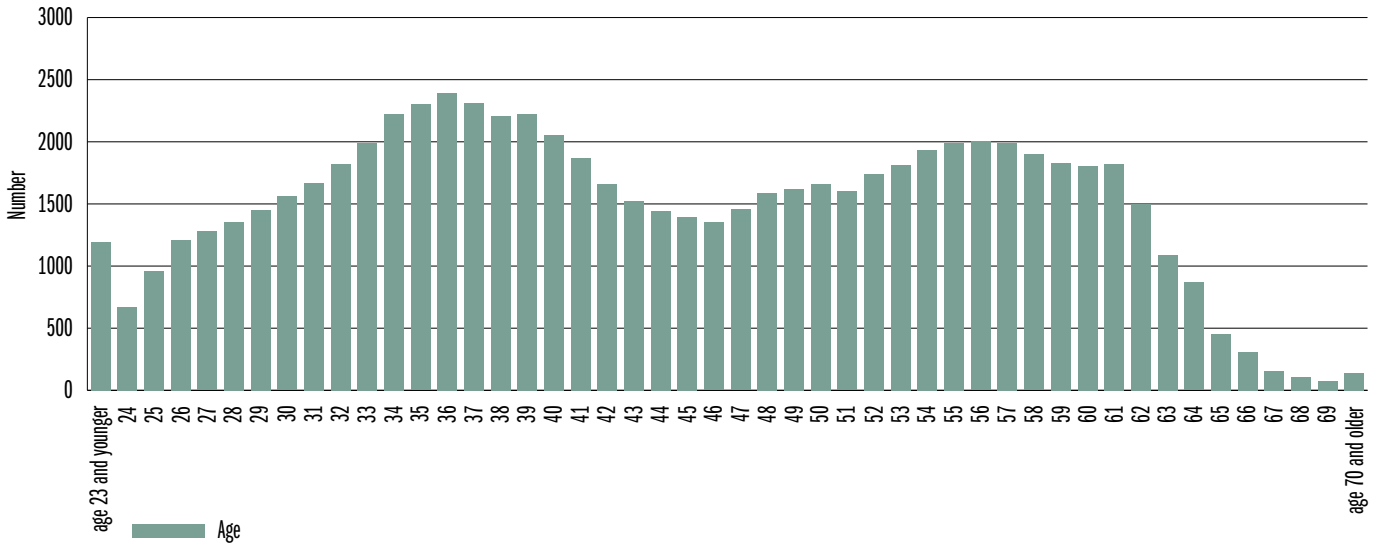
Source: Statistics Norway

Figure 1.12 shows the age distribution among teachers and leaders in municipal and county-administered primary and lower secondary schools. The ages of teachers and leaders in primary and lower secondary school trace a curve with two peaks. Most teachers and leaders are between ages 33 and 40, but there is also a high percentage between ages 52 and 61. In other words, many teachers and leaders are nearing the age of retirement, but a number of younger teachers have also started working in primary and lower secondary school. For more information, cf. chapter 6 on the age distribution for teachers in lower secondary school (the TALIS survey).

Teachers, leaders and assistants in upper secondary education and training

Table 1.10 shows the breakdown of teachers and leaders in upper secondary education, by qualifications and gender. The figures contain information about all employees, including those who only have a second job in the school system. In the autumn of 2008, 24,820 teachers worked in upper secondary education and training, 49 per cent of whom were women. 75.4 per cent of the teachers had a university or college degree with teacher training; 16.4 per cent had a university or college degree without teacher training and 8.2 per cent had only completed upper secondary school or less without teacher training. In the autumn of 2008, 2,721 leaders worked in upper secondary education and training, 45 per cent of whom were

Figure 1.12: Age distribution of teachers and leaders in primary and lower secondary school, fourth quarter 2008. Number.



Source: Statistics Norway

Table 1.10: Teachers and leaders in upper secondary education and training by qualifications and gender. Fourth quarter 2008. Per cent.

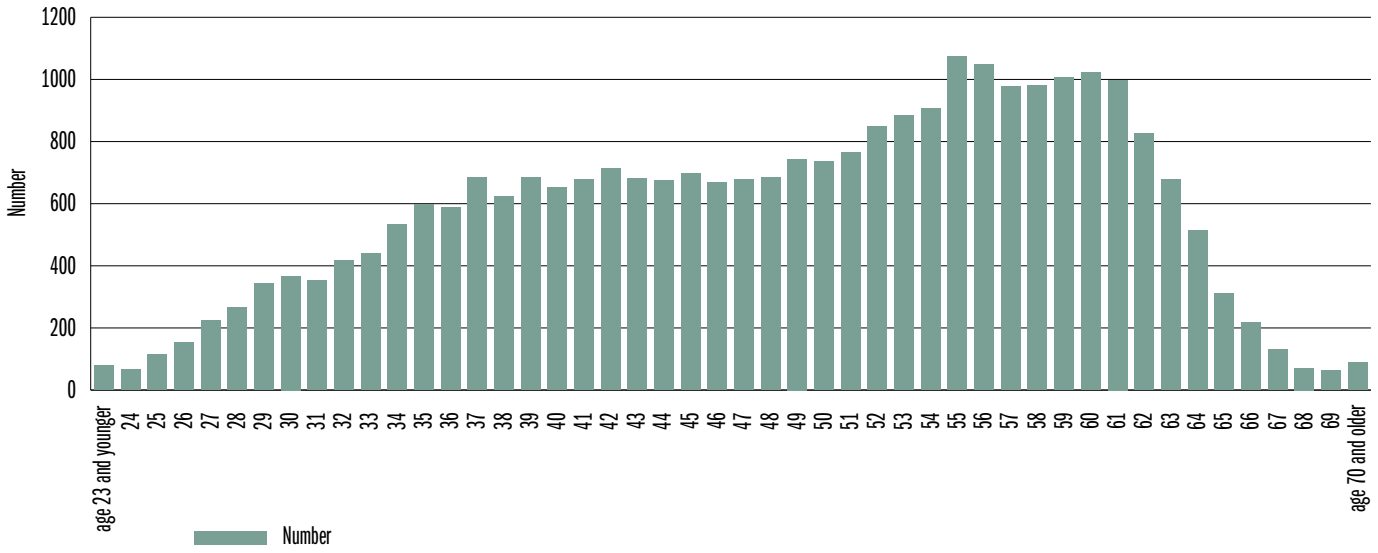
Teachers	Total	Men	Women
Total number of teachers	24 820	12 633	12 187
Higher university or college degree with teacher training	21.0	21.0	21.0
Higher university or college degree without teacher training	7.2	8.0	6.4
Lower university or college degree with teacher training	54.4	50.8	58.2
Lower university or college degree without teacher training	9.2	8.7	9.6
Upper secondary or lower without teacher training	8.2	11.5	4.8
Leaders	**Total**	**Men**	**Women**
Total number of leaders	2 721	1 483	1 238
Leaders with higher university or college degree with teacher training	23.0	22.8	23.3
Leaders with lower university or college degree with teacher training	53.4	54.8	51.8
Leaders who do not have teacher training	23.6	22.4	25.0

Source: Statistics Norway

women. The percentage of leaders who did not have teacher training was 23.6 per cent. 53.4 per cent of the leaders had a lower university or college degree and 23.6 per cent had a higher university or college degree.

Figure 1.13 shows the age distribution among teachers and leaders in upper secondary education and training in the autumn 2008. These teachers and leaders are in general older than those in primary and lower secondary school. 59 per cent of the teachers in upper secondary education and training were above age 45, and 31 per cent were above age 55. Among the leaders, 79 per cent were above age 45, and 45 per cent were above age 55. In contrast to primary and lower secondary school, new teachers are recruited more often to upper secondary education and training from all age groups. 16 per cent of the teachers in upper secondary education and training were under age 36.

Figure 1.13: Age distribution of teachers and leaders in upper secondary education and training. Fourth quarter 2008. Number.



Source: Statistics Norway

2 Resources

This chapter presents resource allocation in primary and secondary education and training in a municipal, county, national and international perspective. The resource input to primary and secondary education and training can be illustrated from many different angles. One way to assess it is to measure the actual expenditures that go to operating schools. Another way to measure the resource input is in the form of the input of teaching staff and other staff. In this chapter, an attempt has been made to present the resource allocation situation by means of development trends, variation among municipalities and among counties and relationships among variables.

Norway's resource allocation on education is relatively high. One reason for this is that Norway has few pupils per teacher, and the teachers' teaching load is lower than in the other countries. One factor that tends to reduce the expenses somewhat is that Norwegian pupils have substantially fewer teaching hours than other countries.

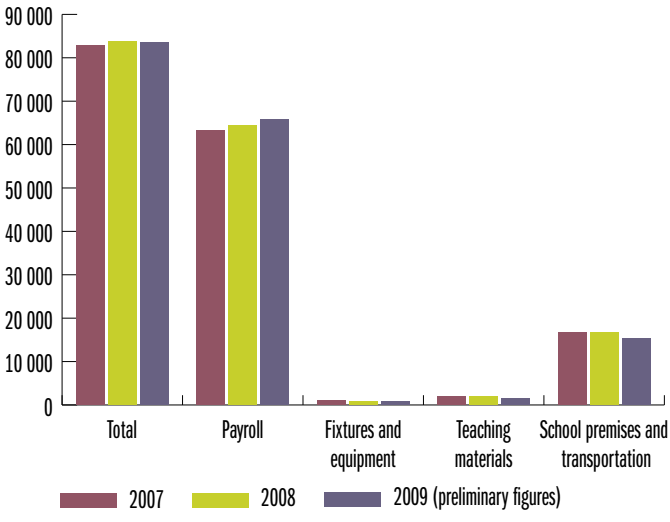
There is great variation among municipalities in the expenditure per pupil. expenditure per pupil is strongly affected by the number of pupils and the travel distance to school, which in turn are affected by the settlement pattern. Among the counties, the variation in expenditure per pupil is not as great as for the municipalities. Here too, the settlement pattern has some effect on the expenses. In addition, the expenses are affected by the percentage of pupils who choose vocational education programmes, which are far more costly than the general studies education programmes.

2.1 Municipal expenses for primary and lower secondary school

A total of 390 out of 430 municipalities have reported preliminary accounting figures for 2009. Figure 2.1 shows the trend and the distribution of average expenditure per pupil in primary and lower secondary school for the last three years. In 2009, *adjusted gross operating expenses amounted to* NOK 83,532 per pupil. After adjusting for price and wage inflation, this amounts to a decrease of 0.2 per cent relative to 2008. From 2007 to 2008, these expenses increased by one per cent. The figure makes it quite clear that payroll expenditures per pupil constitute 79 per cent of the total expenses, and this has a very significant effect on the total expenditure per pupil, but the decline in total expenditure per pupil in the past year is not attributed to changes in payroll expenditures, because the real growth in payroll expenditures per pupil from 2008 to 2009 was two per cent and on the same order of magnitude as the growth from 2007 to 2008.

The main reason for the decline in cost per pupil in the past year is the decline in expenditures on fixtures and equipment, teaching materials, school premises and school transportation. The figures in figure 2.1 have been adjusted for price and wage inflation. They show that expenditures on fixtures and equipment and teaching materials decreased by 27 and 24 per cent respectively from 2007 to 2009. In the previous years from 2004 to 2007, there was an increase in these expenditures. In particular, the expenditures in the 2006-2007 school year increased. Funding for fixtures and equipment and teaching materials in connection with the introduction of *the Knowledge Promotion Reform* in primary and lower secondary school in 2006-2007 explains the trend in these expenditures. Expenditures on fixtures and equipment include both the purchase and rental of items such as ICT equipment, office equipment, computers, tools and books. Among other things, the number of pupils per PC with Internet connections has decreased from 10.5 in 2003-2004 to 3.6 in 2008-2009. This decrease stagnated somewhat in 2007-2008, and in 2009-2010 the number of pupils per PC was 3.3. Expenditures on school premises and school transportation have also undergone a decrease of seven per cent in the past year.

Figure 2.1: Expenditure per pupil in primary and lower secondary school broken down by payroll and operations. 2007–2009. NOK.



Source: KOSTRA (Municipal-State Reporting), group figures

Structural adjustment of municipal expenses per pupil

In order to keep the travel distance of the students from becoming too long, it is more common in municipalities with sparse settlement to have more small schools rather than only a few large ones. Small schools with a low number of pupils entail higher fixed expenses for administration, transportation, operations and other common functions. Having few pupils at each level results in small teaching groups, which in turn results in high payroll expenditures to teachers per pupil. Some of a municipality's expenses can therefore be regarded as tied up, given that the municipality itself has little possibility of affecting these operating expenses. If adjustments are made for the differences among the municipalities in expenses that are attributed to these tied-up expenses, a comparison of the municipalities' expenses may be able to tell us something about how much priority is given to the primary and lower secondary school.

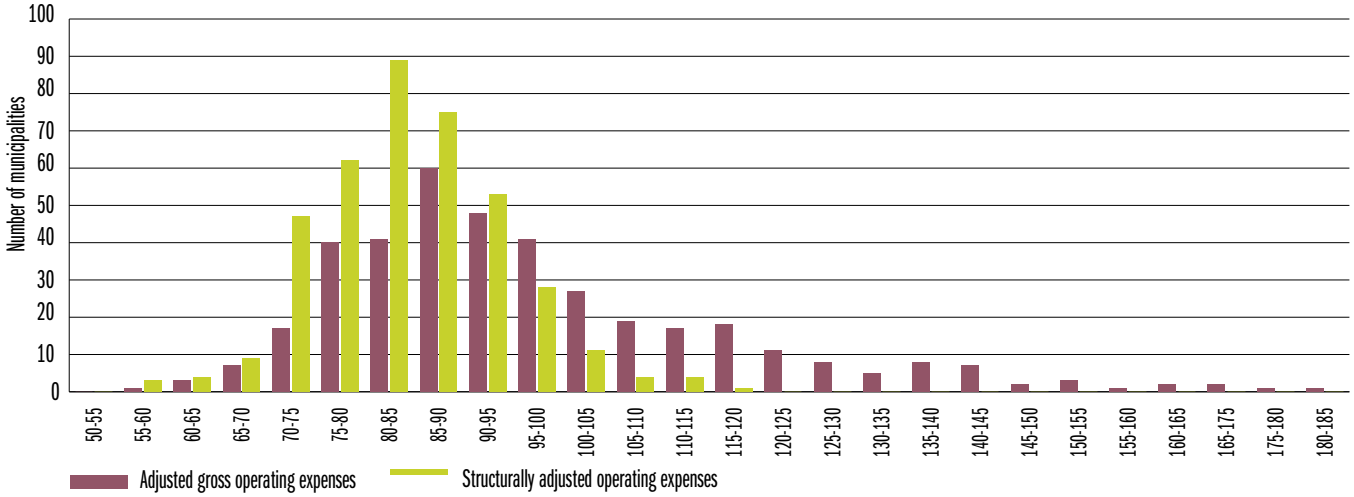
One method that is used to make adjusted gross operating expenses per pupil more comparable is to adjust for the factors that normally have the greatest effect on expenditure per pupil (cf. Borge and Naper 2006, Falch and Tovmo 2007). These factors are number of pupils and travel distance.

Figure 2.2 gives a picture of the spread in adjusted gross operating expenses and structurally adjusted operating expenses per pupil among different municipalities. It shows that after adjusting for number of pupils and travel distance, a far greater percentage of the municipalities will lie near the national average. The figure also shows that the structural adjustment greatly reduces the percentage of municipalities that have extremely high resource allocation per pupil. This is not surprising given that as many as three-fourths of the municipalities' variations in expenditure per pupil can be explained by variations in cost structure (Hægeland, et al. 2009). Unrestricted revenue in the form of revenue from property taxes and income from electrical power stations also has an effect on the level of costs in the municipalities. In particular, electrical power municipalities (which have an annual property tax income from power stations of at least NOK 1000 per inhabitant) spend more money on schools (Hægeland et al. 2009). The rest of the variation among municipalities may be attributed to variation in the number of pupils. Especially in small municipalities, pupils who need extra inputs may have a crucial effect. The differences in school expenses may also be attributed to varying political priorities among municipalities.

Resources for property management of municipal school premises

Compared with the operation of municipal properties for other purposes, such as pre-school, institutions for the elderly and functionally disabled, administration, sport and culture, the largest amount of funds are spent on school premises. Net operating expenses for school premises increased from NOK 1,801 per inhabitant in 2008 to NOK 1,951 per inhabitant in 2009. Adjusted for price and wage inflation, this amounts to an increase of 4.1 per cent.

Figure 2.2: Distribution of municipalities by adjusted gross operating expenses and operating expenses adjusted for cost structure for 2009. NOK 1000.



Source: KOSTRA (Municipality-State Reporting), group figures

2.2 County expenses for upper secondary education and training

Expenditure per pupil

Expenditure per pupil is calculated on the basis of *adjusted gross operating expenses* for general studies and vocational education programmes. In addition, expenses for school premises and boarding schools, administration costs and pedagogical administration, pedagogical joint expenses, and settlements for guest pupils are allocated equally among general studies and vocational education programmes. Payroll expenditures are calculated in an equivalent way by allocating payroll expenditures per pupil for pedagogical administration and pedagogical joint expenses equally between payroll expenditures for general studies and payroll expenditures for vocational education programmes. Operating expenses are calculated as the difference between total expenses and payroll expenditures.

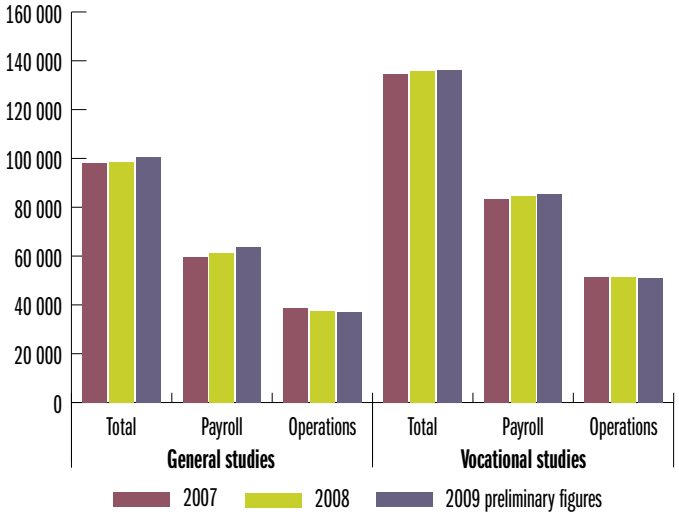
Figure 2.3 shows that the increase in total expenditure per pupil in general studies and vocational education programmes amounted to 1.8 and 0.5 percent respectively from 2008 to 2009. For 2009, the payroll expenditures amounted to 63 per cent of the total expenses for both types of education programmes. The growth in payroll expenditures for general studies and vocational education programmes came to 3.8 and 1 per cent respectively; i.e. operating expenses per pupil have decreased by 1.5 and 0.4 per cent for general studies and vocational education programmes respectively from 2008 to 2009. The numbers in the figure have been adjusted for price and wage inflation.

On the average, 36 per cent more per pupil is spent on vocational than on general studies education programmes. This difference is mainly attributed to requirements for smaller sized groups for vocational education programmes, which results in payroll expenditures per pupil that are 37 per cent higher and operating expenses that are 38 per cent higher for pupils in vocational education programmes. The teaching in many of the vocational programme subjects requires access to tools, materials and machinery. For example, the operating expenses for a pupil in agriculture, fishing and forestry is fully 160 per cent higher than for a pupil who takes specialisation in general studies. This is attributed to high expenses for the operation of agricultural and fish farming facilities.

Differences in county expenses

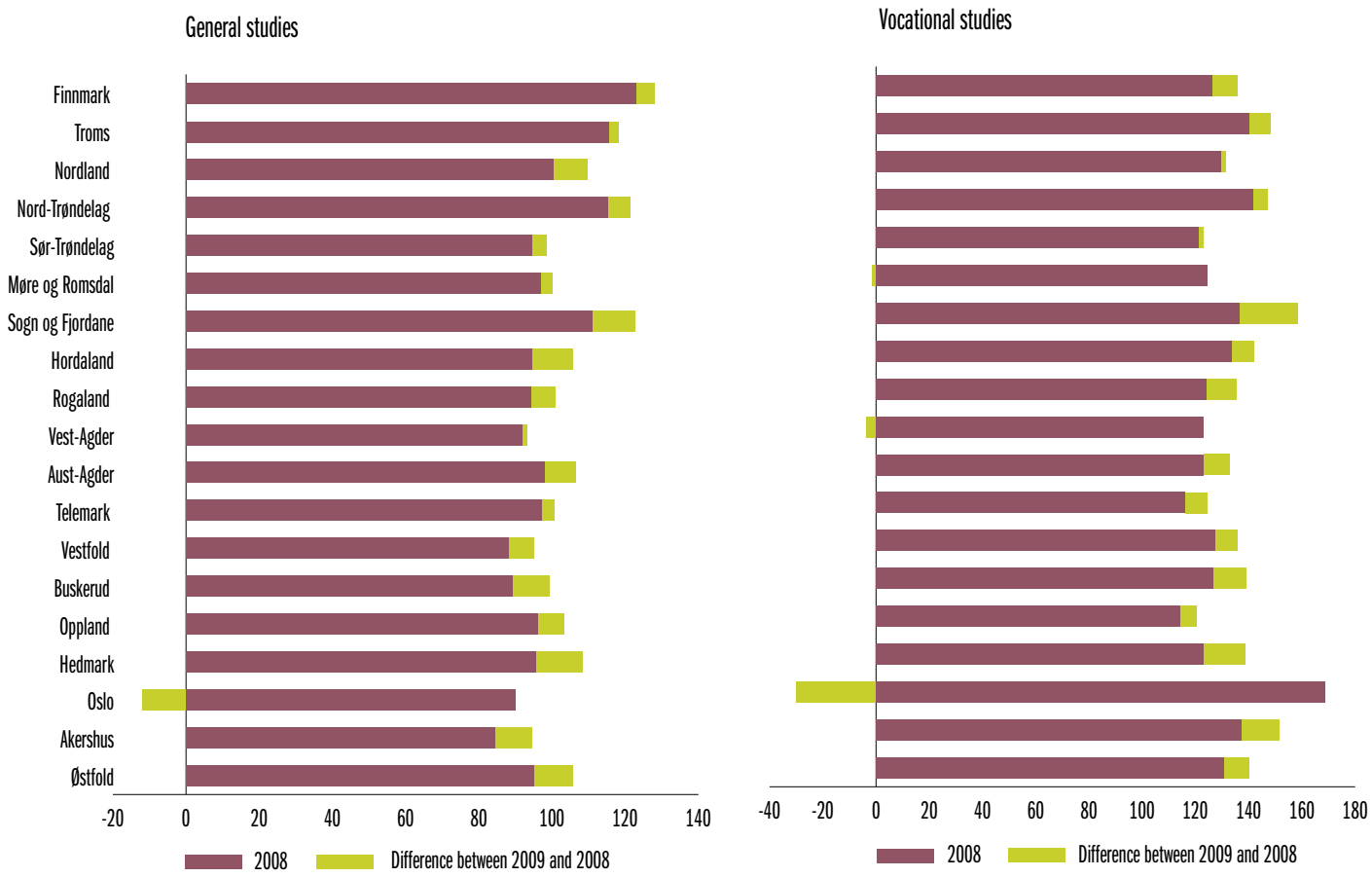
Figure 2.4 shows differences and changes in the county expenses in the last two years. As with the municipalities, sparsely settled counties have higher expenses. Since expenses for transportation between school and home were no longer included in the total expenses starting in 2007, it is primarily the effect of disadvantages due to small-scale operations (Bonesrønning et al. 2008) that are in evidence. In 2008, Oslo had the highest expenditure per pupil in vocational education programmes of all of the counties. In 2009, these expenses declined substantially to about the average level for the counties. This was because reported expenses for school premises and boarding schools in Oslo decreased from NOK 31,760 per pupil in 2008 to NOK 10,008 per pupil in 2009. Especially for vocational education programmes, which have fewer pupils (about

Figure 2.3: Expenditure per pupil in general studies and vocational education programmes broken down by payroll and operations. 2007–2009.



Source: KOSTRA (Municipality-State Reporting), group figures

Figure 2.4: Changes in expenditure per pupil broken down into general studies and vocational education programmes. 2008–2009. NOK 1000.



Source: KOSTRA (Municipality-State Reporting), group figures

4,000 as opposed to 10,000 in general studies), the effects of this are substantial. This major reduction in expenses for school premises and boarding schools is not reflected in figures reported in the county accounts (including intermunicipal companies and own enterprises) and must therefore be attributed to insufficient reporting from groups and not be ascribed to real changes in costs. The slight decrease in expenditure per pupil for vocational education programmes in Vest-Agder and Møre og Romsdal counties is in accordance with figures reported from the county accounts and is deemed to be real.

Resources for vocational education and training

Adjusted gross operating expenses for vocational education and training in the workplace (including purchases from the private sector in connection with vocational education and training in the work-place) per apprentice and/or training candidate increased by 7.8 per cent from 2008 to 2009, whereas there was a decrease of 0.2 per cent from 2007 to 2008.

The substantial increase in expenses per capita can be partly explained by a decrease of 2.3 per cent in the number of apprentices and training candidates from 2008 to 2009. Expenses for teaching, administration, follow-up of companies, etc. will not be as greatly affected by annual fluctuations in the number of apprentices and training candidates, so expenses per capita will increase.
By comparison, there was an increase in the number of apprentices and training candidates of 5.7 per cent from 2007 to 2008.

The percentage of net operating expenses for upper secondary education and training that go to vocational education and training in the workplace increased from 8 to 8.4 per cent from 2008 to 2009. This percentage has increased steadily each year since 2004, when it was seven per cent. This was mainly attributed to the increase in the number of apprentices from the 2003-2004 school year up to 2008-2009 (in addition, cf. chapter 1).

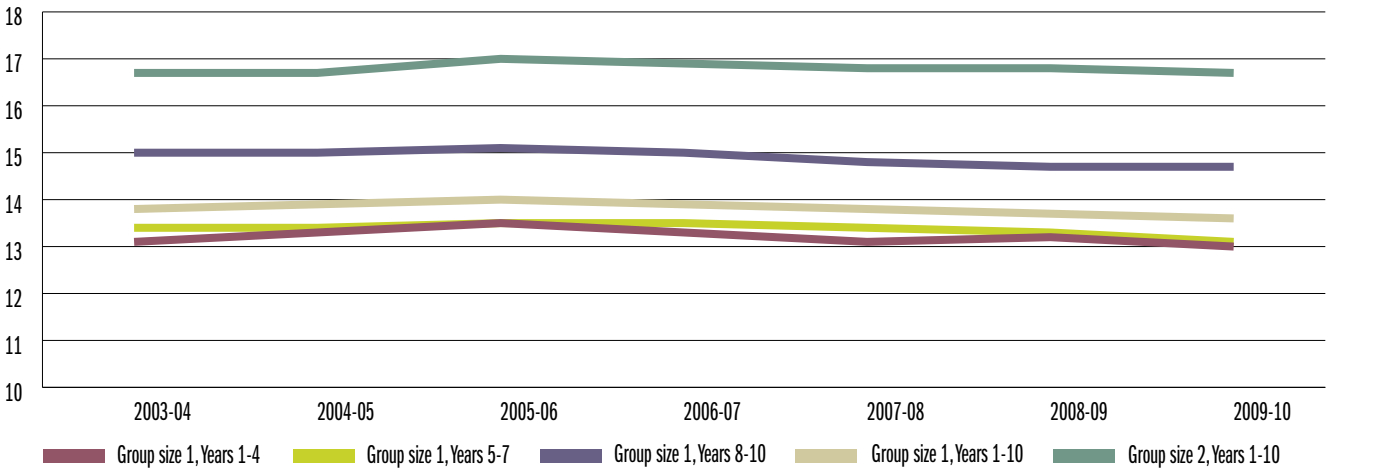
2.3 Resource input of staff

Another way to study resource input is to look at the utilisation of staff. The resource input in the form of staff can be measured in various ways. Here we choose to look at teacher density, full-time equivalents (FTEs) for teaching and other tasks, use of assistants, the percentage of teaching staff who do not have an approved degree and the percentage of teaching hours that go to special needs education and adapted language education.

Teacher density

The concept of teacher density describes the ratio of the number of pupils to teachers. The rescinding of the old class division rules in 2003 have given the municipalities and the schools greater freedom of choice in the way in which the teaching is organised. At present there is only one statutory requirement, i.e. that the group size shall be suitable from an educational point of view. In order to meet this

Figure 2.5: Group size 1 for the various levels of education. 2003–2004 to 2009–2010.



Source: The Primary and Lower Secondary School Information System (GSI)

requirement and prevent the absence of the class division rule from being used as an austerity measure in the municipalities, the Storting passed a resolution that the old class division rule should determine the minimum level of resource allocation even though the class division rule has been rescinded. Thus, there has been great political interest in the trend in teacher density after the class division rule was rescinded. The Storting's resolution has been followed up with a supervisory scheme.

However, there is little indication that the teacher density has any general impact on the pupils' learning outcomes. It looks as if teacher competence, especially subject-didactic competence, is a more apt explanatory factor for learning outcomes. For pupils with poorer aptitude and less support at home, there are still grounds for arguing that smaller groups give better learning outcomes (The Swedish National Agency for Education 2009).

Figure 2.5 shows that group size 1 has steadily declined for all years since it peaked in the 2005-2006 school year. The exception was in Years 1-4, where there was a slight increase from the 2007-2008 school year to 2008-2009. The increase in 2008-2009 was because the increase in the number of teaching hours was not as large as the increase in the number of pupil hours. The increase in pupil hours is a result of the statutory strengthening of Norwegian, mathematics and English with 190 more teaching hours in that school year. The number of pupil hours increased by about six per cent from 2007-2008 to 2008-2009, whereas the number of teaching hours increased by about 4.2 per cent. The reason why there was an increase in the group size that year may be that in many cases it took time to recruit more teachers.

According to group size 2, which gives a picture of the pupils' everyday situation, there is an average of three more pupils per teacher than that measured by group size 1. Group size 2 shows the same trend as group size 1 in the last seven years.

Figure 2.6 shows how the breakdown of municipalities by the number of pupils per teacher in an average teaching situation has changed in the last five years. This change consists of a decrease in the number of municipalities that have an average high group size 1 (14-20 pupils per teacher). One factor that the 13 municipalities that had an average of more than 16 pupils per teacher in the 2009-2010 school year had in common was that they have an average school size of more than 200 pupils. These municipalities were Asker, Drammen, Elverum, Enebakk, Gjerdrum, Klæbu, Lørenskog, Nannestad, Nittedal, Rælingen, Skedsmo, Ski and Sørum. In 2009-2010, slightly less than 30 per cent of the country's pupils went to schools where group size 1 was higher than 16 pupils per teacher.

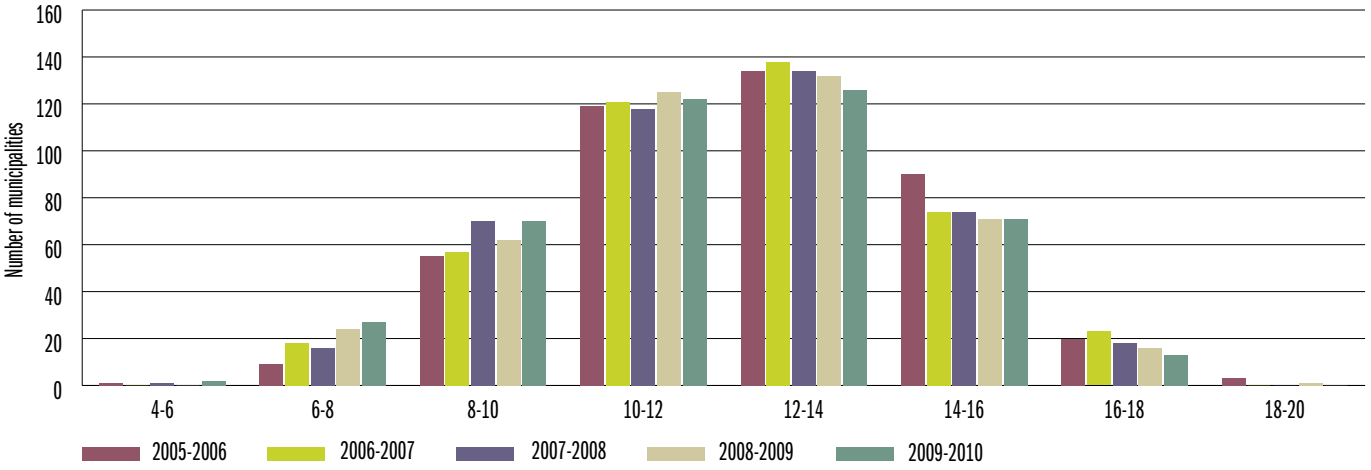
Definitions of measurements of teacher density:

Group size 1 is defined as the ratio of the total number of pupil hours (the total number of hours of teaching received by each pupil) to the total number of teaching hours (the total number of teaching hours given by the school's teachers). This then becomes a measurement of group size from the pupils' point of view, where average group size is an expression for the number of pupils per teacher in an average teaching situation. Group size 1 is robust as far as changes in the organisation of the teaching over a period of time are concerned. On the other hand, pupils who receive special needs education (SNE) or adapted language education are often physically separated from other pupils. Thus, including these pupils in the indicator may give the impression that the teacher density is greater than it actually is.

Group size 2 is distinguished from group size 1 in that periods for SNE and for adapted education in Norwegian for language minorities are excluded from both teaching hours and pupil hours in the calculation. Group size 2 gives a more realistic picture of the average group size. However, it will be less suitable for comparing changes over a period of time because it is dependent on changes in practices related to the organisation of special needs education and adapted education in Norwegian.

Both of the definitions give a measurement of how many pupils share a teacher in an average teaching situation. High teacher density gives low group size.

Figure 2.6: Distribution of municipalities by group size 1 for Years 1-10. 2005-2006 to 2009–2010.



Source: The Primary and Lower Secondary School Information System (GSI)

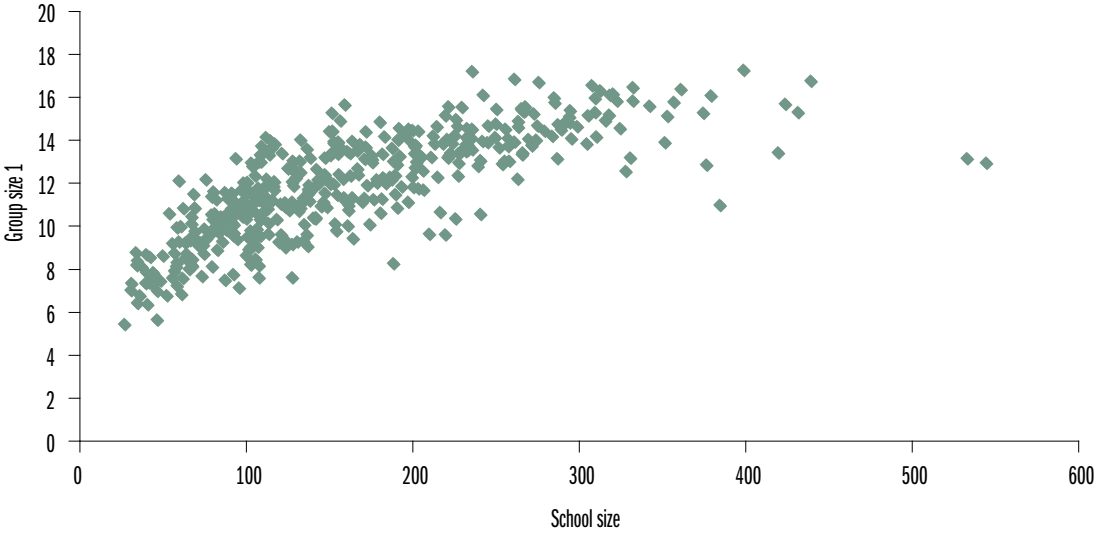
Figure 2.7 shows that group size 1 is strongly determined by the school size, since fully 68 per cent of the variation among the municipalities can be explained by average school size (67 per cent for group size 2). The ratio between the two variables is non-linear in nature because the growth in group size 1 appears to level off when the average school size exceeds 300 pupils per school. Two municipalities distinguish themselves by having an intermediate group size even though they have a very high average school size (> 500 pupils per school).

Pupils per form teacher

Section 8-2 of the Education Act states that the class or basic group shall have one or more teachers (form teachers) who are especially responsible for the practical, administrative and social educational tasks relating to the class or basic group and the pupils who are in it, including contact with each pupil's home. Figure 2.8 shows that the number of pupils per form teacher has increased slightly from 15.4 to 15.8 pupils in the past year after having been roughly unchanged since 2005-2006. The increase may be related to the fact that a higher percentage of the pupils attend bigger schools, cf. chapter 1. The drop from 2003-2004 to 2004-2005 in the number of pupils per form teacher is related to the rescinding of the old class division rule. The fact that the number of pupils per form teacher is lower for Years 8-10 than for the other Years may be attributed to different practices in the way form teachers are used in the different Years. One explanation may be that form teachers are responsible for the whole basic group in Years 1-7 because the average group size is lower there, whereas this function is more often divided between two teachers in lower secondary school.

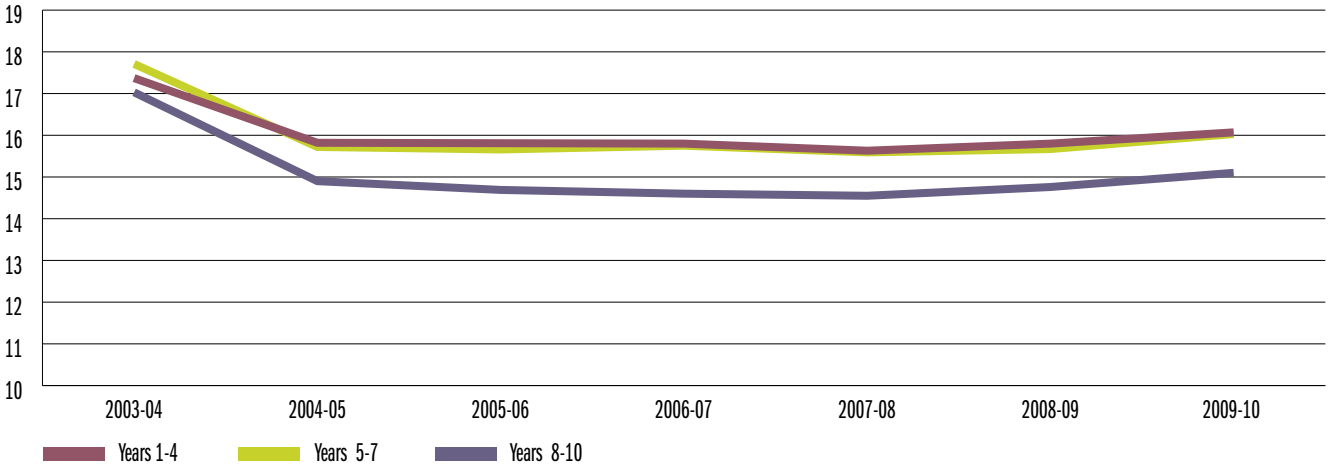
Figure 2.9 shows that for the last three years there has been an increase in the number of municipalities that have 16 or more pupils per form teacher. For the previous two school years, 2005-2006 to 2007-2008, the trend was the opposite. In 2009-2010, 60 per cent of the pupils attended schools where the number of pupils per form teacher was higher than 15. The corresponding figure for 2007-2008 was 55 per cent. As with the group size, there is also a positive ratio between school size and the number of pupils per form teacher.

Figure 2.7: The relationship between average number of pupils per school year and average group size 1 for the municipalities. 2009–2010.



Source: The Primary and Lower Secondary School Information System (GSI)

Figure 2.8: Number of pupils per form teacher. 2003–2004 to 2009–2010.



Source: The Primary and Lower Secondary School Information System (GSI)

One analysis shows that 33 per cent of the variation in the number of pupils per form teacher among municipalities can be explained by school size.

Percentage of teachers who do not have an approved degree

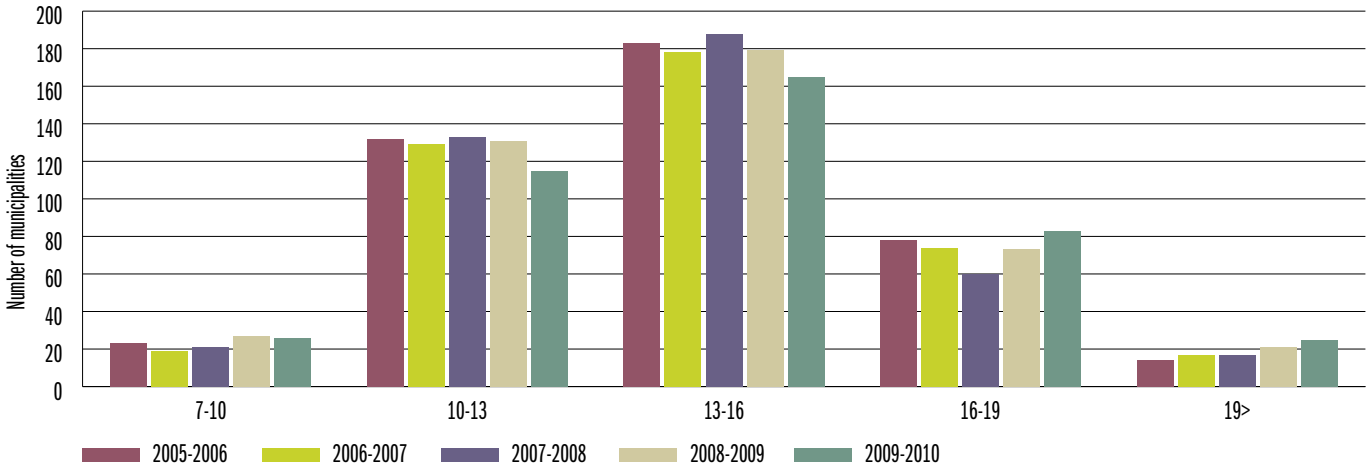
Figure 2.10 shows that the percentage of teaching staff who do not have an approved degree has almost doubled in the period from 2005-2006 to 2009-2010. Even though the teaching staff who do not have an approved degree does not constitute a large percentage in total, their number has increased markedly. The percentage is highest in Years 1-4 and decreases for higher Years. There is not any complete overview of the education that these teachers have, but they are probably a rather heterogeneous group. For example, a teacher who does not have an approved degree may have substantial professional competence, but lack teaching qualifications. In a report from Norwegian Social Research (NOVA) (Bakken 2010) in connection with the evaluation of the Knowledge Promotion Reform, it was noted that for the 2.5 per cent of the pupils who have the highest percentage of teachers who do not have an approved degree, less than 86 per cent of the teaching is conducted with approved teacher competence.

Figure 2.11 shows that over 90 per cent of the municipalities have a low percentage (0-5 per cent) of teachers who do not have an approved degree. The figure also makes it clear that there has been an increase in the last five years in the number of municipalities that have a relatively high percentage of teachers who do not have an approved degree. The highest percentage of teachers who do not have an approved degree is in the small municipalities with sparse settlement. In 2009-2010, 12 percent of the nation's primary and lower secondary school pupils attended schools where more than 10 per cent of the teachers did not have an approved degree.

Calculated full-time equivalents (FTEs) for teaching

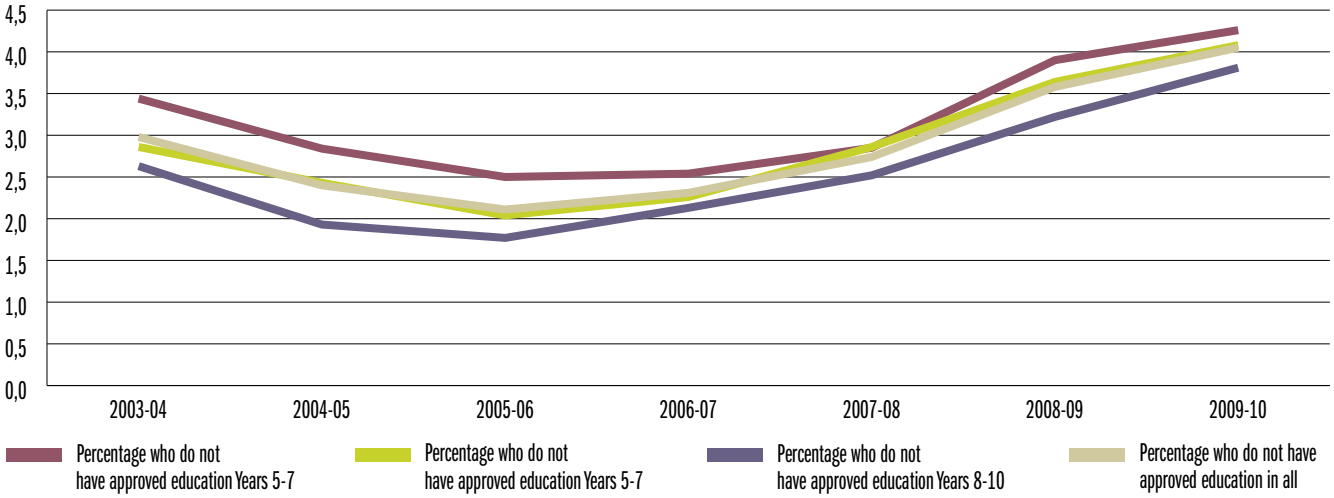
The full-time equivalent concept in the Primary and Lower Secondary School Information System (GSI) includes the annual number of teaching hours *(the teaching load)*. Full-time equivalents for tasks other than teaching include the part of the FTE that provides a basis for a reduction in the teaching load. Among other things, this includes the form teacher function, social and career counselling and reduced teaching load for teachers over age 55 (senior measure). Non-scheduled time is not included in the teaching FTE.

Figure 2.9: Distribution of municipalities by pupils per form teacher. Years 1-10. 2005-2006 to 2009–2010.



Source: The Primary and Lower Secondary School Information System (GSI)

Figure 2.10: Teachers who do not have an approved degree for the Year that they teach. 2003-2004 to 2009–2010. Per cent.



Source: The Primary and Lower Secondary School Information System (GSI)

Calculated full-time equivalents (FTEs):

Due to changes in the degree of detail in the Primary and Lower Secondary School Information System (GSI) reporting for the 2008-2009 and 2009-2010 school years, there is a gap in the time series for reported FTEs for teaching and for purposes other than teaching. Therefore, the reported figures cannot be compared back in time. In order to get a comparable and more realistic picture of the trend in FTEs for teaching, FTEs have been calculated on the basis of reported teaching hours per year. Teaching hours per year are divided by the annual number of teaching hours: 741 hours for primary school and an average of 665 hours for lower secondary school. The equivalent computation is made for hours per year for tasks other than teaching. For hours per year for which we do not know the distribution between the primary school and lower secondary school respectively, we have assumed that they are distributed in the same way as teaching hours per year.

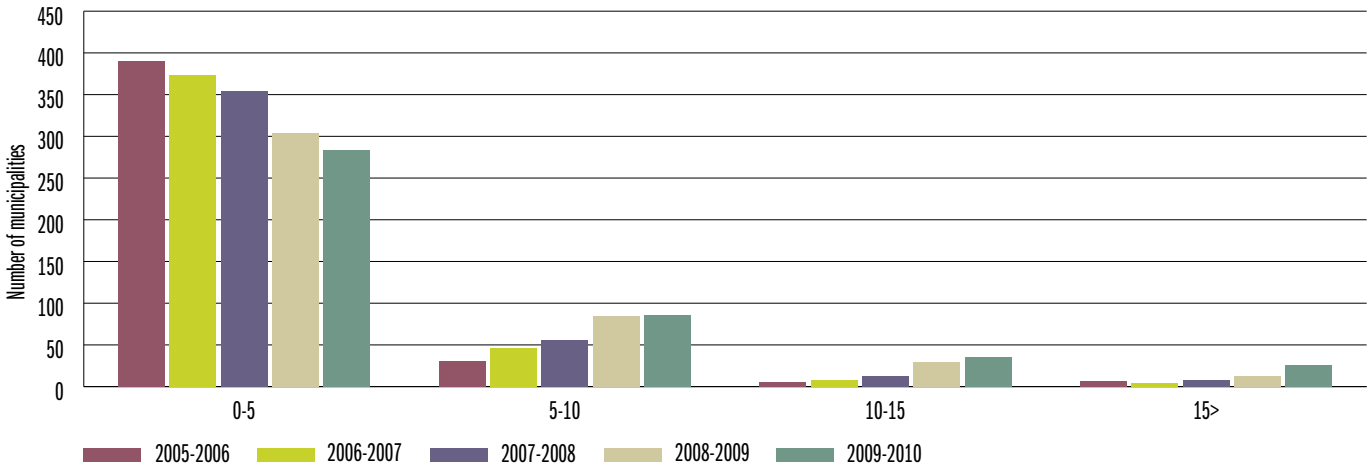
Source: The Norwegian Directorate for Education and Training

If the teaching load is reduced as a result of an increase in the time spent on other tasks, the teaching time for the pupils above a minimum level may be reduced if the size of the workforce in the school remains the same. Figure 2.12 shows that calculated FTEs for teaching have increased slightly in the last six years. For the last few years, the increase is equivalent to about 270 FTEs from Years 1-7 and nearly 155 FTEs in Years 8-10. The increase in the percentage of calculated FTEs for tasks other than teaching is relatively higher than the percentage of calculated FTEs for teaching.

Additional resources

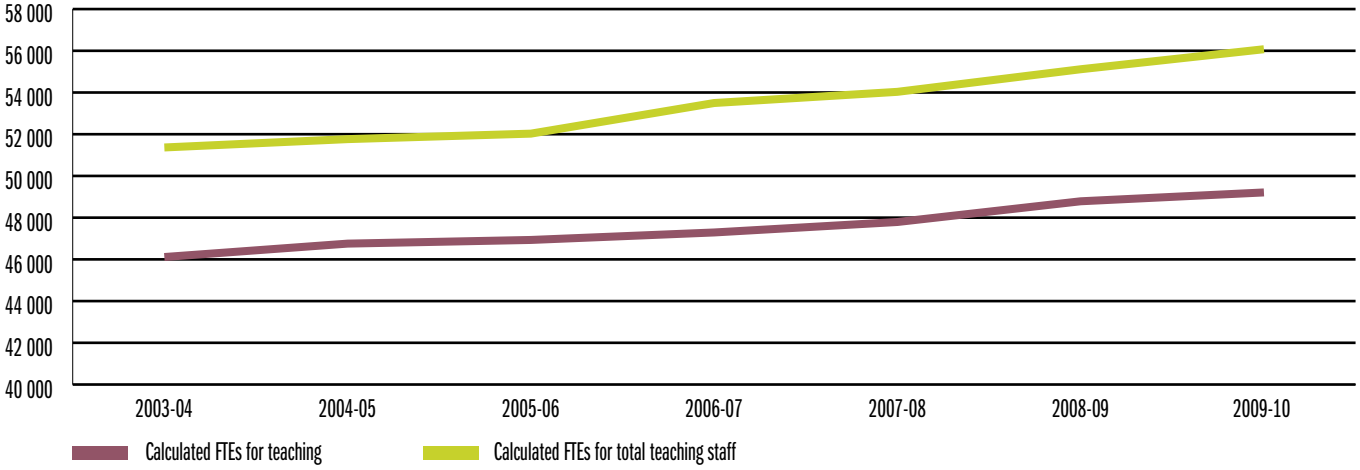
Other staff, in the form of assistants, administrative staff and educational administrators, technical office staff, and ICT staff can relieve the teachers by doing necessary tasks that do not involve teaching. Figure 2.13 shows the number of FTEs for other staff in the school system relative to the total number of teaching FTEs. In particular, the percentage of assistant FTEs has increased in the last few years. In 2009-2010, there was an average of one assistant FTE for every seven teaching FTEs. By comparison, there is an average of one FTE for ICT staff for every 200 teaching FTEs.

Figure 2.11: Distribution of municipalities by number of teachers who do not have an approved degree for the Year that they teach. 2005-2006 to 2009–2010. Number.



Source: The Primary and Lower Secondary School Information System (GSI)

Figure 2.12: Trend in calculated full-time equivalents (FTEs) for teaching and calculated FTEs for total teaching staff. 2003-2004 to 2009–2010. Number.



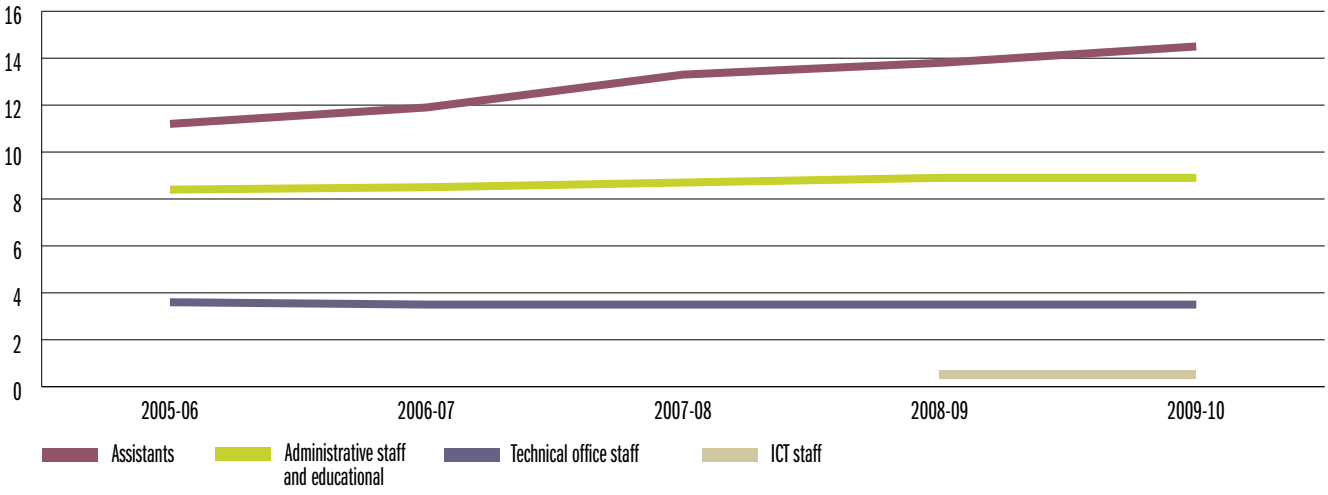
Source: The Primary and Lower Secondary School Information System (GSI)

As the number of assistants in the school system has increased, the need for knowledge about which tasks assistants perform has also increased. Therefore, assistant hours for special needs education have been specially registered in the Primary and Lower Secondary School Information System (GSI) starting in the 2009-2010 school year. For primary school, the percentage of assistant hours for special needs education out of the total number of assistant hours amounts to a total of around 54 per cent in primary school and 58 per cent in lower secondary school. A survey of what assistants are used for, shows that they are primarily used to provide personal and practical assistance to individual pupils (Vibe and Evensen 2009).

In December 2008, the Ministry of Education and Research appointed a committee to assess the ways in which time is spent in primary and lower secondary school (Years 1-10). The committee was called the *Tidsbrukutvalget* (the Time Utilisation Committee). The committee's mandate was to recommend measures that will provide a better utilisation of the time resources in the school system so that the pupils shall be given good learning conditions and good learning outcomes. In connection with that, the Ministry gave the Centre for Economic Research at NTNU (SØF) the task of performing a quantitative survey of the way time was spent and the organisation in primary and lower secondary school in the spring of 2009.

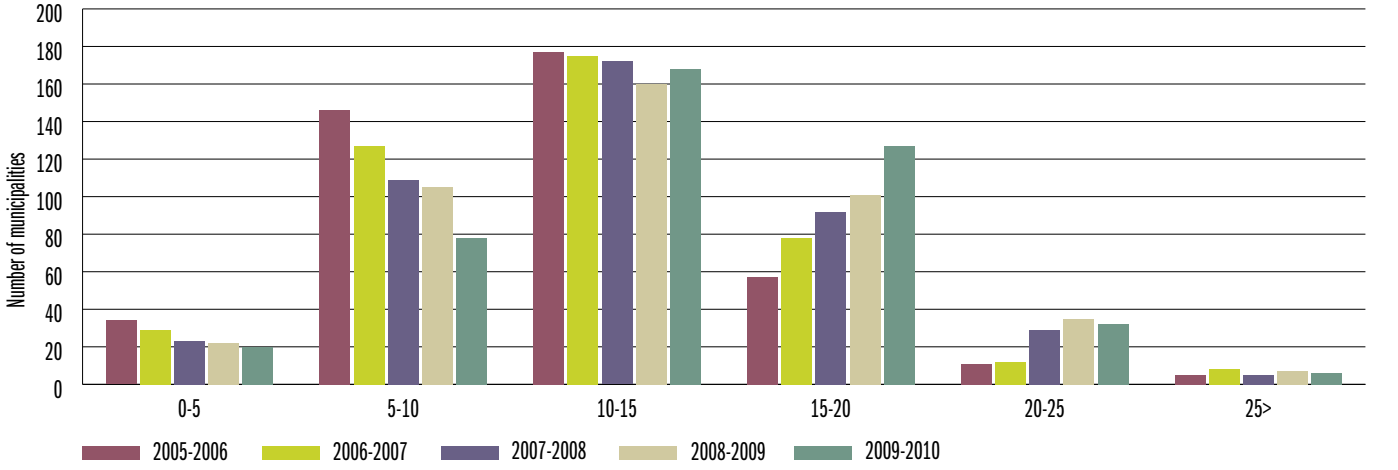
The surveys show that there is great variation in the ways the teachers spend their time on academic and non-academic activities, both within each individual school and among schools. SØF shows that differences in resources are only weakly related to this variation. They find little statistical connection between the amount of time the teachers spend on various tasks and variables such as school size, the number of teaching hours per pupil, the percentage of assistant FTEs and the percentage of pupils with adapted language education (Borge et al. 2009). SØF found, however, that big schools have somewhat fewer teaching hours and form teachers per pupil and fewer FTEs for administrative staff and educational administration per teaching FTE. On the other hand, they find that big schools make more use of assistants, technical office staff and ICT staff per teaching FTE than do smaller schools. One possible interpretation of

Figure 2.13: FTEs performed by other staff as a percentage of total teaching FTEs. 2005-2006 to 2009–2010. Per cent.



Source: The Primary and Lower Secondary School Information System (GSI)

Figure 2.14: Distribution of municipalities by percentage of FTEs performed by assistants relative to FTEs performed by the teaching staff. 2005–2010.



Source: The Primary and Lower Secondary School Information System (GSI)

these relationships is that big schools have economies of scale with regard to the division of labour and specialisation (Strøm et al. 2009).

Figure 2.14 shows that there has been a sizeable increase in the number of municipalities that have a relatively high percentage of assistant FTEs (≥ 15 per cent). In the 2009-2010 school year, 16 per cent of the pupils attended schools where assistant FTEs relative to teaching FTEs amounted to 15 per cent or more. The equivalent figure for the 2005-2006 school year was 10 per cent.

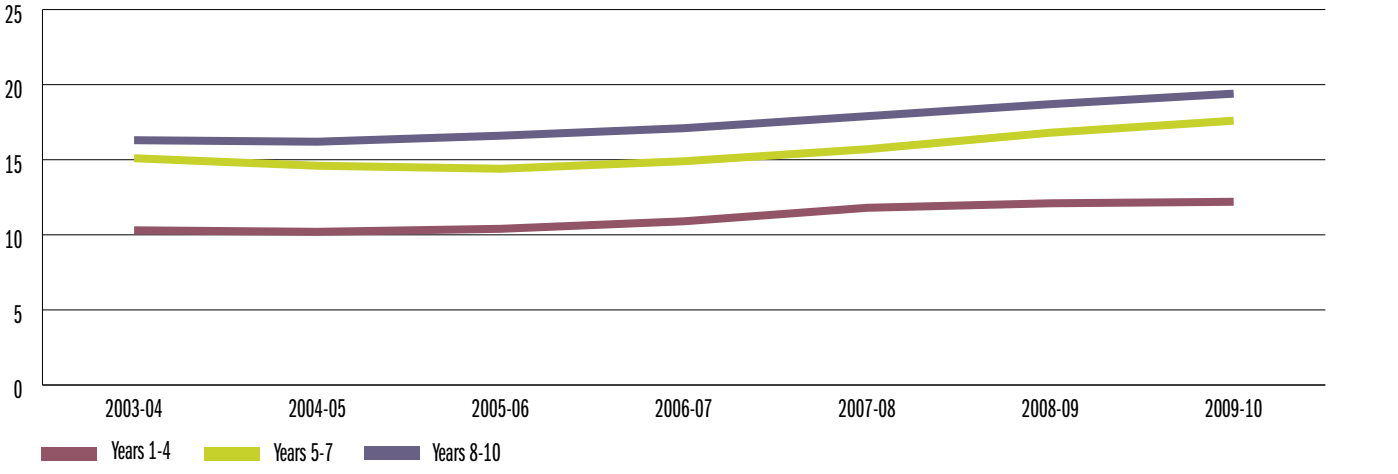
2.4 Resources for special needs education (SNE)

Figure 2.15 shows that the percentage of teaching hours that are spent on special needs education continues to increase. The percentage is higher for the later Years of schooling. In the 2009-2010 school year, an average of 16.2 per cent of the teaching hours go to special needs education. In Years 8-10, over 19 per cent go to special needs education. In Years 1-4 an average of 12.2 per cent go to special needs education. In the past year, the percentage of pupils with SNE increased most in Years 1-4, whereas the percentage of teaching hours for SNE increased most in Years 5-7.

This may be because the number of hours that are scheduled is higher for pupils in Years 5-7 or that the percentage who receive SNE without scheduled hours or with hours with an assistant is higher for Years 1-4. The distribution of the number of scheduled hours with a teacher is only available for all of the Years taken together. Figure 2.16 shows that it is most common to give a decision on SNE with a teacher for 76-90 hours per year. This is equivalent to two to 2.4 hours per week. It is about one fourth of the hours given to those with scheduled hours with a teacher, who are given a relatively large number of hours, more than seven hours per week.

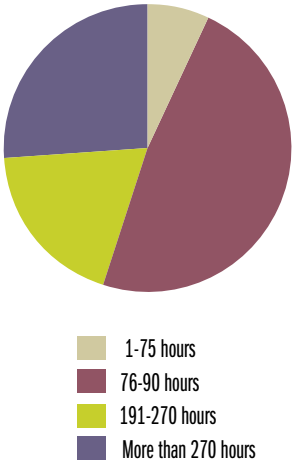
At the municipal level, there has been a major increase in the last five years in the number of municipalities with a high percentage of teaching hours for SNE, cf. figure 2.17. During this period, there has

Figure 2.15: Teaching hours for special needs education (SNE) as a percentage of total teaching hours, by Year. 2003-2004 to 2009–2010. Per cent.



Source: The Primary and Lower Secondary School Information System (GSI)

Figure 2.16: Decision on special needs education with a teacher broken down by number of hours. 2009–2010.



Source: The Primary and Lower Secondary School Information System (GSI)

been a tripling of the number of municipalities in which 20 per cent or more of the teaching hours were spent on SNE. In the 2009-2010 school year, one fourth of Norway's primary and lower secondary school pupils attended schools where more than 20 per cent of the teaching hours were spent on SNE. In 2005-2006, the equivalent figure was 16 per cent of the pupils.

An analysis shows that there is a slightly positive relationship between the number of pupils with an individual decision on special needs education per municipality and the financial basis of the municipality (unrestricted revenue). Unrestricted revenue is responsible for 10 per cent of the variation among the municipalities. This is in accordance with findings made by Hægeland et al. (2009).

Teaching hours for adapted education in Norwegian for language minorities

In 2009-2010, almost seven per cent of the pupils had individual decisions on adapted education in Norwegian. That percentage has increased slightly throughout the whole period from 2003-2004; cf. figure 2.18. This is related to the fact that annual immigration has increased by 80 per cent from 2003 to 2009. The largest increase has been in immigrants from Poland. The percentage of teaching hours for adapted education in Norwegian amounted to about four per cent of the teaching hours in 2009-2010. The percentage of teaching hours for adapted education in Norwegian has decreased slightly since 2005-2006. Thus, the percentage of teaching hours for adapted education in Norwegian has decreased even though the percentage of pupils with adapted education in Norwegian in accordance with individual decisions has increased. This seems to indicate that a greater proportion of the adapted education in Norwegian takes place in larger groups.

2.5 Extra teaching hours

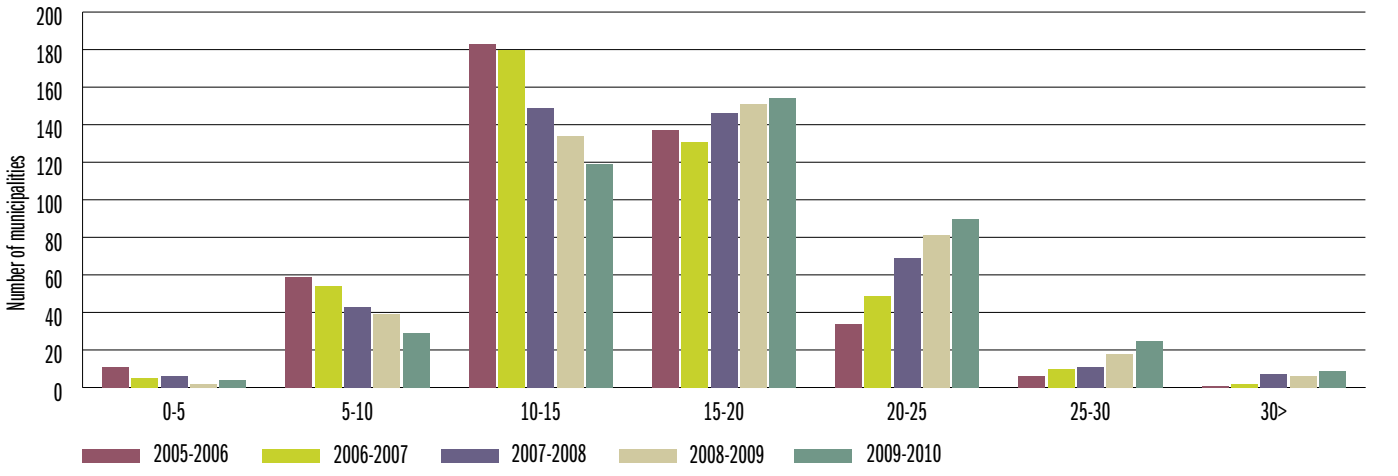
One way to compare the resource input among municipalities is to consider how many extra teaching hours are given to pupils above the minimum number of hours. Extra hours are defined as the difference between the actual number of teaching hours that are given in a municipality and a calculated minimum number of hours. This provides a measurement of teacher allocation above a minimum level where only one teacher is present in a group.

Calculated minimum number of hours

The minimum number of hours is calculated as the product of the annual number of hours and the calculated number of groups. The number of groups is calculated according the old class division rules (28 for the primary school and 30 for the lower secondary school). The number of weeks is set equal to 38 for the whole period. Schools with an average of less than 12 pupils per Year are excluded from the analysis because the calculated minimum number of hours may exceed the actual number of hours at small schools.

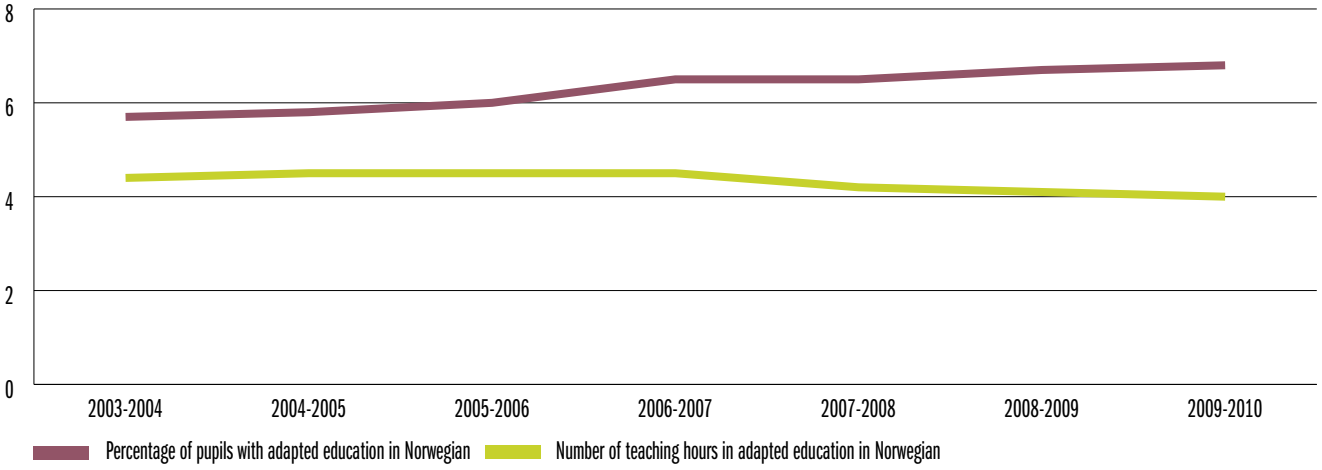
Figure 2.19 shows that extra teaching hours were approximately unchanged in the 2009-2010 school year compared with 2008-2009. Since 2005-2006, extra teaching hours have decreased somewhat with the exception of the 2007-2008 school year.

Figure 2.17: Distribution of municipalities by percentage of teaching hours for special needs education (SNE). 2005-2006 to 2009–2010.



Source: The Primary and Lower Secondary School Information System (GSI)

Figure 2.18: Teaching hours for adapted education in Norwegian for language minorities and percentage of pupils with adapted education in Norwegian by individual decision. 2003-2004 to 2009–2010. Per cent.



Source: The Primary and Lower Secondary School Information System (GSI)

Extra teaching hours:
The difference between the actual number of mainstream teaching hours and the calculated minimum number of hours and/or basic resources.

Total extra teaching hours:
The difference between the actual number of teaching hours including teaching hours for SNE and teaching hours for adapted education in Norwegian and mother tongue instruction for language minorities and the calculated minimum number of hours.

The total number of extra teaching hours has increased since 2005-2006; i.e. the schools are increasingly assigning more hours than the calculated minimum number of hours to special needs education, adapted education in Norwegian and mother tongue instruction.

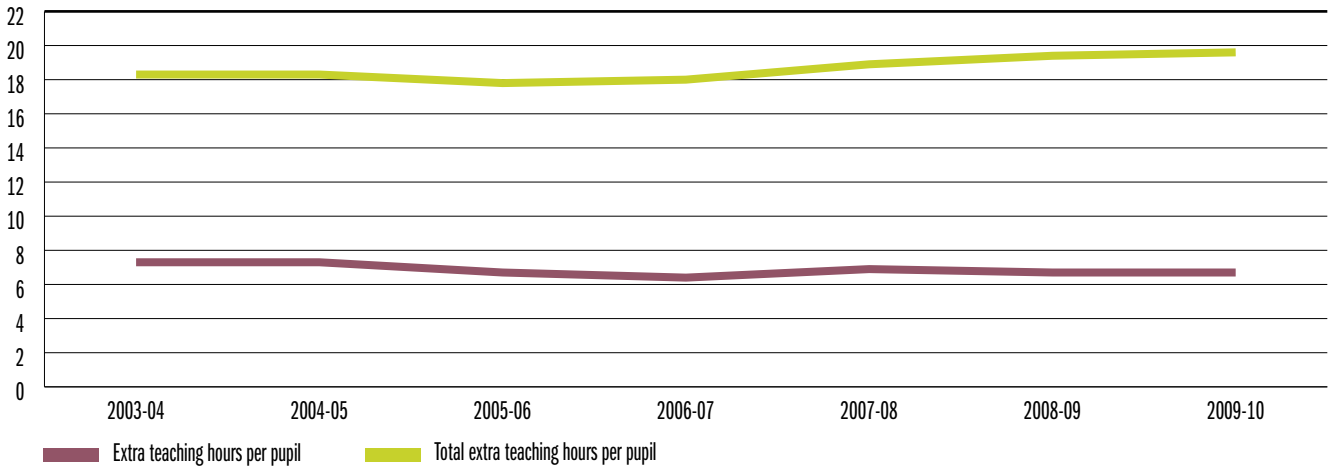
Comparison among various types of extra teaching efforts

An analysis of the relationship among different types of extra teaching efforts shows that one hour less of extra hours per pupil results in an average increase of 0.15 hours per pupil in SNE or language instruction. Consequently, there is a trend that municipalities that provide fewer ordinary extra hours for instruction provide more hours for SNE and extra language instruction. The analyses check the effect of demand for other municipal services, of the size of municipality, of municipal income, of level of education and of social factors.

2.6 Norway's resource allocation compared to other OECD countries

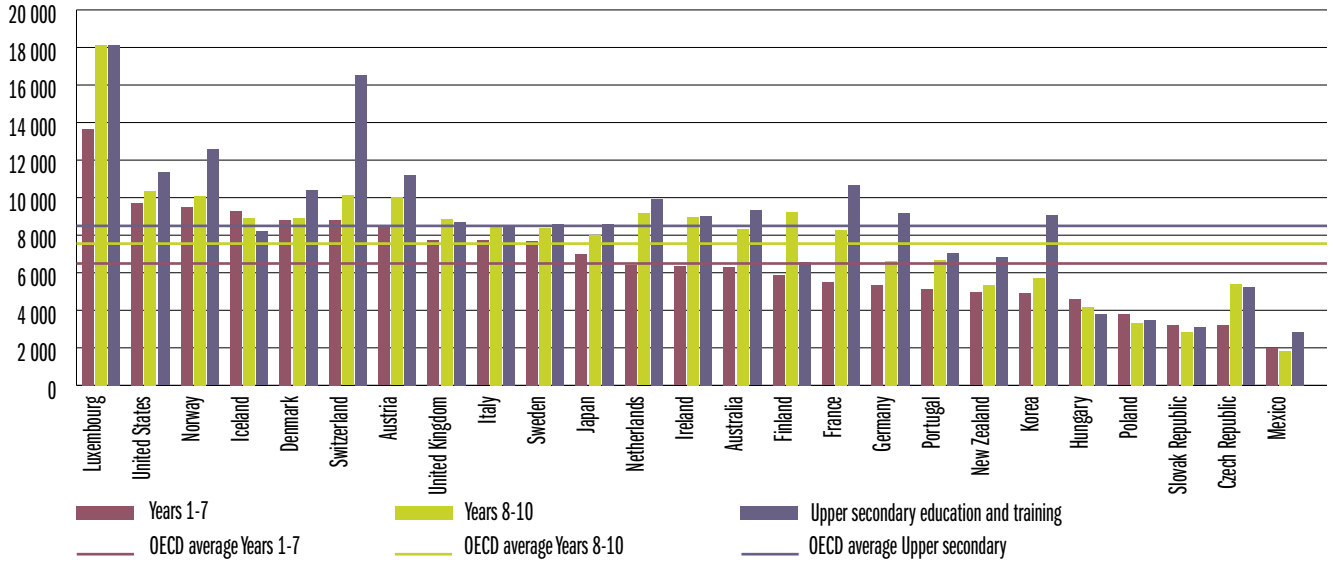
Education at a Glance (OECD 2009a) compares the resource allocation in the education sector in the OECD countries. The figures for expenditure per pupil are preliminary from 2006.

Figure 2.19: Extra teaching hours per pupil and total extra teaching hours per pupil. 2003-2004 to 2009-2010. Number.



Source: The Primary and Lower Secondary School Information System (GSI), Pettersen 2010 (unpublished)

Figure 2.20: Expenditure per pupil in the OECD countries in 2006. Adjusted for the general price and cost level in each country. USD.



Source: OECD 2009a

Figure 2.20 shows the countries ranked according to expenditure per pupil in Years 1-7. The figure shows that there is a wide range of expenditures per pupil among the OECD countries. For instance, the expenses for Years 1-7 range from USD 2,008 in Mexico to USD 13,676 in Luxembourg. As in previous years, Norway was among the leaders in 2006 when there was a comparison of the amount allocated per pupil for primary and lower secondary school as opposed to upper secondary education and training. Norway allocated 47 per cent more in Years 1-7; 34 per cent more in Years 8-10 and 48 per cent more on upper secondary education and training per pupil than the OECD average. Ranked by the amount that is allocated to Years 1-7, Norway lies in third place after Luxembourg and the USA. Ranked according to resource allocation on Years 8-10, Norway has the fourth highest resource allocation after Luxembourg, the USA and Switzerland. Upper secondary education and training in Norway is ranked third. Part of the reason for the high expenses may be that teachers at upper secondary schools in Switzerland have the highest pay among the OECD countries. In addition to teacher salaries, teaching hours per teacher, the teachers' teaching load and pupils per teacher (group size) also have an effect on payroll expenditures per pupil. For the USA, it is especially the number of teaching hours per teacher that contributes to the high payroll expenditures. For Luxembourg, the low group size raises the payroll expenditures. Norway's high payroll expenditures per pupil (which constitute a high percentage of the total expenses) are attributed to the low group size for Years 1-7 whereas for upper secondary education and training it is the teaching load that primarily raises the payroll expenditures (OECD 2009a).

Figure 2.21 shows that Norway is among the countries with the lowest number of pupils per teacher. Compared to the average for the OECD countries, the average number of pupils per teacher in Norway is 32 per cent lower for Years 1-7, 23 per cent lower for Years 8-10 and 22 per cent lower for upper secondary education and training. Likewise, the teachers' teaching load is 7, 8 and 20 per cent lower respectively than the average for the OECD countries for the same levels of education (figures from 2007). By comparison, the planned teaching time in accordance with local curricula for pupils ages 7-15 is 13 per cent lower in Norway than the average for the OECD countries (OECD figures from 2007).

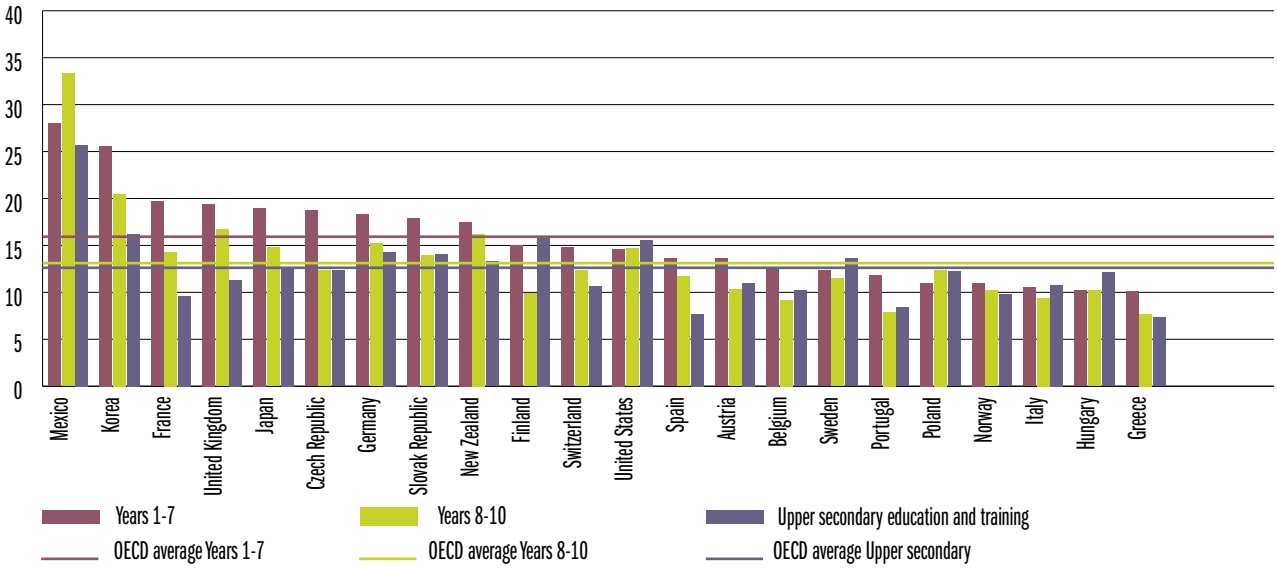
The other Nordic countries also lie above the OECD average in resource allocation. The exception is Finland, which allocates a little less than the OECD average in Years 1-7 and in upper secondary education and training. On the other hand, Finland allocates proportionately more on Years 8-10, fully 22 per cent more than the OECD average. In that way, it distinguishes itself from most of the countries, where the resource allocation increases in step with the level of education.

Cost per pupil relative to gross domestic product (GDP) per inhabitant tells us something about how much priority is given to education in a country. Based on this calculation, Norway lies somewhat below the OECD average. The averages for the OECD countries for Years 1-7, 8-10 and upper secondary education and training are 20, 23 and 26 per cent respectively. However, Norway has the highest GDP of all the countries and will therefore allocate more resources on most sectors, including the education sector, compared to countries that are less well-off. It also has a significant effect on the results that the total GDP for Norway, including petroleum revenues, is used as a basis for comparison.

2.7 National priorities for primary and secondary education and training

For the first time in 20 years, there was a decrease in GDP measured in fixed prices in Norway. The GDP for mainland Norway decreased by 1.5 per cent from 2008 to 2009. Since expenditures on education are mostly tied to fixed expenses such as payroll, these will not be affected as greatly as the factors that affect GDP (production, consumption), and the percentage of GDP that goes to education

Figure 2.21: Pupils per teacher in OECD countries. Calculated on the basis of full-time equivalents. 2007. Number.



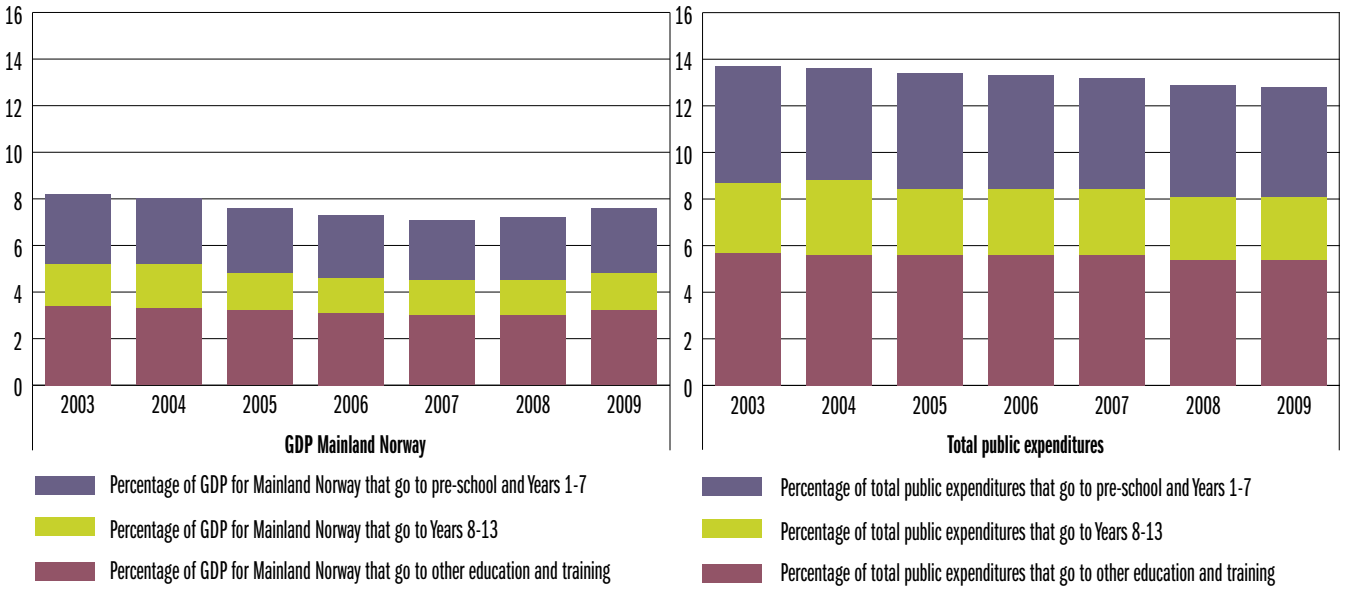
Source: OECD 2009a

will therefore increase from 7.2 to 7.6 per cent, cf. figure 2.22. From 2003 to 2007, the percentage of GDP for mainland Norway that goes to education declined by about one per cent. At the same time, GDP for mainland Norway increased by 35 per cent so that the total expenditures on education increased.

Expenditures on education constitute about 13 per cent of the total public expenditures and are the third largest expenditure area. By comparison, the highest percentage, 39 per cent of the total public expenditures, goes to social protection (the greatest amount to illness, disability and old age), whereas 17 per cent goes to health (primarily hospital services and medical services).

Figure 2.22 shows that the percentage of the total public expenditures that goes to education has declined by a little less than one per cent since 2003. The biggest decrease has been in the percentage of expenditures that goes to Years 8-10 and to upper secondary education and training: a decline of 0.5 per cent from 2004 to 2009. Total public expenditures in 2009 increased by NOK 80 billion compared with 2008. One of the main reasons for this decline was that benefits to households increased considerably. Among other things, unemployment benefits more than doubled from 2008 to 2009.

Figure 2.22: Expenditures on education and total public expenditures. 2003 to 2009. Percentage of GDP.



Source: Statistics Norway, National Accounts

3 Learning outcomes

This chapter deals with pupils' and apprentices' learning outcomes in primary and secondary education and training. Some of the most important sources of information about learning outcomes are national tests, marks statistics and craft and journeyman's examinations. Some of the questions that are answered are: How big are the gender differences in the outcomes of national tests? What marks did pupils with various family backgrounds achieve? What are the school's contributions to the pupils' learning when we take differences in the pupils' family background into consideration? How many of those who take craft and journeyman's examinations pass the examination?

Norway participates in several international comparative surveys that provide useful information about Norwegian pupils' learning outcomes in the areas that are measured here, such as *reading, mathematics, natural sciences* and *social sciences*. At year-end 2009, the results of the survey TIMSS Advanced were published and attracted a fair amount of attention. The survey covers pupils who have taken full in-depth study in *physics* (3FY) and *mathematics* (3MX) in the past year in upper secondary education and training, and shows, for example, that Norwegian pupils had poorer competence in *physics* at this level in 2008 than pupils who were tested in 1995. In mathematics, the pupils' outcomes were substantially poorer in 2008 than in 1998, which was the comparison year for the Norwegian mathematics outcomes. The results in *physics,* however, are still relatively good compared with pupils in the other countries in the study, even though the drop in the pupils' outcomes was relatively large in that subject as well.

3.1 What influences the learning outcomes?

In analyses of pupils' learning outcomes, the focus is often on their family background. A number of Norwegian studies have shown that the pupils' achievements, e.g. in national tests, overall achievement marks in Year 10, marks in upper secondary education and training and results of craft and journeyman's examinations, are strongly related to the parents' level of education and the pupils' immigrant background (cf. e.g. Grøgaard et al. 2008, Bonesrønning and Iversen 2010, Bakken 2010). In addition to family background, the pupils' gender also plays a significant role. Girls have consistently higher average marks than boys in most subjects, language majority pupils have better results than minority pupils, and pupils who have parents with a high education achieve better than pupils who have parents with low education. In the international surveys, such as PISA, PIRLS and TIMSS, we find the same patterns (e.g. cf. Kjærnsli et al.). 2007).

Hægeland et al. (2005) have studied the relationship between family background and school achievement, measured by marks for Year 10 in Norwegian schools in 2002 and 2003. In this context, family background consisted of a large number of characteristics, such as the parents' education, income, assets, employment, national insurance status, marital status, family size, etc., based on Statistics Norway's (SSB) register data. The study showed that in a statistical sense family background can explain about one third of the differences in marks among individual pupils. This means that family background is the most important known factor for explaining school achievement.

Norwegian Social Research (NOVA) is conducting an evaluation project to study whether the Knowledge Promotion Reform helps reduce social inequality in learning outcomes in lower secondary school based on minority status and parents' education. Gender is also included in the analyses. The second partial report from the project shows that in the first year of the Knowledge Promotion Reform there was no reduction in differences in marks among pupils of different gender, different minority status or different levels of parents' education (Bakken 2010). The strength of the relationship between parents' level of education and the pupils' marks has increased by five per cent, whereas differences in marks between boys and girls and between majority pupils and minority pupils with immigrant backgrounds have remained stable.

An analysis of pupils' learning outcomes and the school's impact on them shows that the school that the pupils attend consistently explains less than 15 per cent of the achievement differences among pupils (Grøgaard et al. 2008). This also coincides to a great extent with findings in the international surveys, where small differences in achievement among schools are an important characteristic for Norway and the other Nordic countries in an international perspective. The analysis of the pupils' learning outcomes shows that resources, the school's efforts at quality improvement and the learning environment explain relatively little of the variation in the pupils' results. However, the available indicators at the school level are not good enough to capture differences in different schools' contributions to the pupils' learning.

In the international research literature about what characterises effective schools, there has been a shift over a period of time from a focus on the effects of input factors, which it was thought could be directly affected by external resource inputs and changes in regulations, to research on more process-related characteristics of good schools (Grøgaard et al. 2008). Among other things, it has been argued more and more strongly that the school's main resource is academically and pedagogically skilful teachers, which is often not well enough captured in studies of the purely formal qualifications that are required for a teaching post.

In 2008, the Danish Clearinghouse for Educational Research was commissioned by the Ministry of Education and Research to conduct a systematic review of the forms of teacher competence that led to improved learning for the pupils (Nordenbo et al. 2008). In addition to the purely academic insight of the teacher, the selected studies showed that three types of competence were important. 1) Didactic competence: high academic level combined with the ability to convey the subject. 2) Rule management competence: clear leadership in the teaching work and the ability to give pupils responsibility for devising and maintaining rules. 3) Relational competence: activating and motivating the pupils and the ability to take the pupils' different aptitudes into consideration.

The researcher John Hattie has gone through over 800 meta-studies with a focus on the things that affect learning and achievement (Hattie 2009). Based on this review, Hattie thinks that teaching must involve the teachers choosing suitably challenging learning goals and criteria for success and making the pupils capable of achieving these goals by monitoring and evaluating the effectiveness of the teaching.

National tests:

The national tests shall survey the extent to which the pupils' skills are in accordance with the objectives of the curriculum for basic skills in mathematics and reading Norwegian and English as they are integrated into the competence objectives for subjects in LK06 after Years 4 and 7. The tests shall provide information to pupils, teachers, school leaders, parents and guardians, school owners, and the regional and central authorities as a basis for efforts to promote improvement and further development.
Source: www.udir.no/Artikler/_Nasjonale-prover/Rammeverk-for-nasjonale-prover/

Results from national tests will be presented by means of averages and standard deviations (spread) and as a percentage distribution on a scale with three mastering levels for Year 5 and five mastering levels for Year 8. The pupils will be distributed among the different mastering levels according to the total number of points they scored on the tests. The scale is determined by the Norwegian Directorate for Education and Training on the basis of analysis and assessment of the results at the national level.
Source: www.udir.no/Artikler/_Nasjonale-prover/Hva-er-nasjonale-prover2/

Schools, municipalities and counties can assess their own test results by comparing their own distribution of mastering levels, averages and standard deviations with the national level or other schools and municipalities.
Source: www.udir.no/Veiledere/Nasjonale-prover---veileder-til-skoleeier-og-skoleleder/

Table 3.1: Percentage of pupils who were exempted or had some other form of absence from the national tests. Per cent.

	Exempted			Other absence		
	2007-2008	2008-2009	2009-2010	2007-2008	2008-2009	2009-2010
English, Year 5	1.5	1.7	3.0	0.4	0.5	0.7
Reading, Year 5	2.2	2.6	3.6	0.9	0.9	0.8
Mathematics, Year 5	2.0	2.4	2.8	1.0	0.8	0.7
English, Year 8	0.7	0.8	1.5	0.5	0.7	1.5
Reading, Year 8	1.3	1.7	1.9	1.4	2.0	1.6
Mathematics, Year 8	1.2	1.6	1.1	1.8	1.6	0.8

Source: The Norwegian Directorate for Education and Training

The teachers must constantly try to see learning through the eyes of the pupils, create a secure and cooperative climate where the pupils can make mistakes and learn from them and from each other (teachers, pupils and peers), and make their feedback to the pupils about what they learn as good as possible.

In addition, cf. chapter 2 on resources and chapter 4 on the pupils' learning environment.

3.2 National tests in Years 5 and 8

National tests were conducted in September 2009 for all pupils in Years 5 and 8. The objective of national tests is to evaluate the extent to which the school is successful in developing the pupils' basic skills in reading Norwegian and English and in mathematics. Therefore, national tests are not tests in subjects, but in basic interdisciplinary skills. The tests in reading and mathematics are not just based on the competence goals in *Norwegian* and *mathematics*, but also in other subjects in which goals for reading and mathematics are integrated. The tests in English distinguish themselves from the two other tests in that they are based on the competence goals in only one subject.

In 2009, the tests in mathematics were conducted as an electronic test for the first time. The tests in English were also electronic, whereas the tests in reading were still paper-based. The evaluation of the year's results shows that all three tests for both Years 5 and 8 had problems with a broad range of difficulty and were able to draw a clear distinction between weaker and stronger pupils (The Norwegian Directorate for Education and Training 2010) The average percentage of the problems that the pupils managed to solve varied somewhat among the tests, from 50 per cent of the problems in mathematics in Year 8 to 62 per cent in reading in Years 5 and 8.

Most of the pupils took the tests in the autumn of 2009, but table 3.1 shows that the percentage who were exempted increased somewhat during the three years that the tests were given. This applies in particular to English in Year 5, where the percentage of exempted pupils increased from 1.5 per cent to 3 per cent in the period 2007-2009.

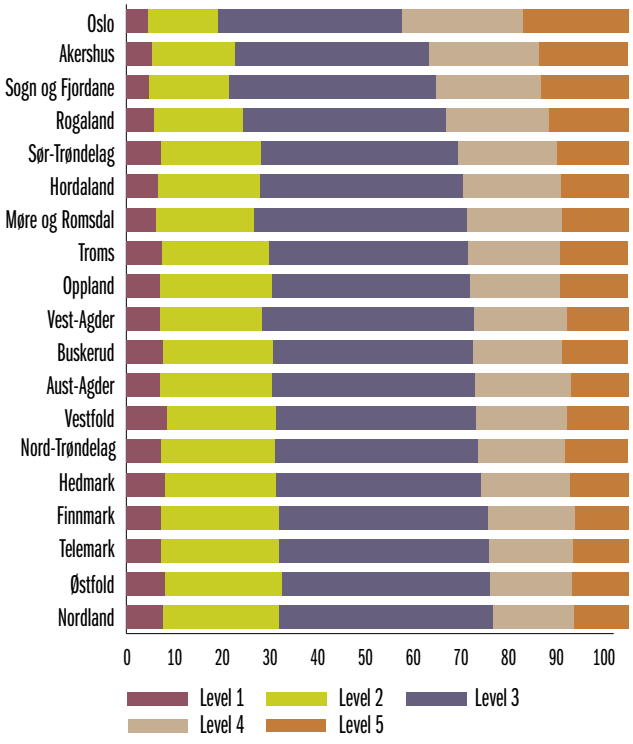
Regional differences

In most counties, the majority of the pupils are concentrated in the middle of the national tests scale, but there are still clear differences among the counties in both Year 5 and Year 8. The results in mathematics in Year 8 in 2009 can serve as an example.

Figure 3.1 is sorted by county with the largest percentage of pupils at mastering levels four and five of the national tests in mathematics in Year 8. Oslo and Akershus have the highest percentage of pupils at levels 4 and 5 of all the counties, and this applies to all three tests in Year 8. These two counties also have the most pupils at the highest mastering level (level 3) in all three of the tests in Year 5.

In the analysis of national tests for 2007 and 2008, the focus is on the very good results of Sogn og Fjordane County's pupils in the national tests, especially in Year 8 (Bonesrønning and Iversen 2010). After interviews with chief municipal education officers from this

Figure 3.1: Results in mathematics on the national tests for Year 8 in 2009, by county. Percentages in the five mastering levels.



Source: Statistics Norway's StatBank Norway

county, it is indicated that stability, a good learning tradition and good teacher quality may be important explanatory factors. The researchers have also analysed the results for the large cities and find that the Oslo pupils perform considerably better than the pupils in all of the other big cities. The good results for Oslo are not limited to a special group of pupils, but apply regardless of whether the parents have a high or a low level of education and apply to pupils with both a Norwegian and immigrant background, but this does not mean that Oslo has managed to equalise social disparities.

Analyses of municipal differences in the results of the national tests for 2007 and 2008 show that the smallest municipalities with fewer than 2,500 inhabitants are falling behind on the tests (Bonesrønning and Iversen 2010). The trend is that the smaller the municipality, the worse the pupils' test results. This also applies when consideration is given to individual characteristics of the pupils, such as the parents' level of education. One explanation for this *may* be that the small municipalities do not have an opportunity to be as active school owners as the larger municipalities. However, there is also variation in the results for the small municipalities, and those who have the best results are those that generally have large schools. It is not clear why this is so; the researchers think that there are not any pure economies of scale, but that there may be other explanations for this correlation.

Gender differences

In an analysis of gender differences in the results of national tests for 2007, 2008 and 2009 (Opheim 2010), the researchers find that there are no significant differences between boys and girls in either Year 5 or Year 8. Girls do somewhat better than boys in reading, whereas boys do somewhat better than girls in mathematics. The differences between the genders in English are small.

The gender differences in national tests have varied somewhat from year to year. Several studies have pointed out that gender differences in national tests and in international studies can be partly attributed to the content and the form of the tests (Kjærnsli et al. 2007, Bonesrønning and Iversen 2010). Multiple choice questions and electronic tests tend to favour boys (Turmo and Lie 2006), and girls and boys achieve differently on different types of problems in *mathematics*. In the national tests in mathematics in 2009, it was especially in the area of *measurement* that the boys were clearly better than the girls (Ravlo et al. 2010). It has turned out that boys are often better than girls at applying knowledge, whereas girls are better in pure computational skills (Kjærnsli et al. 2007). Most of the problems in the national tests in mathematics test the application of knowledge. This may be a contributing factor that helps explain why the boys do better than the girls in the test. Thus, changes in gender differences in national tests are not necessarily a sign of changes in achievements, but may be a result of changes in the design of the tests from one year to the next.

Differences by immigrant background

In the analysis of the results of the national tests for 2007, 2008 and 2009 on the basis of the pupils' immigrant background (Opheim 2010), the pupils are divided into five categories of immigrants.

Classification by immigrant background

First generation immigrants from non-western countries:
Pupils born abroad with two foreign parents from Asia, Africa, Latin America, Oceania excluding Australia and New Zealand or Europe outside the EU or EEA.

Descendents from non-western countries:
Pupils born in Norway with two foreign-born parents from these countries.

First generation immigrants from western countries:
Pupils born abroad with two foreign born parents from the EU or EEA, the USA, Canada, Australia or New Zealand.

Descendents from western countries:
Pupils born in Norway with two foreign-born parents from these countries.

The majority group:
The rest of the pupils, over 90 per cent of the pupils in Years 5 and 8.

Source: Opheim 2010

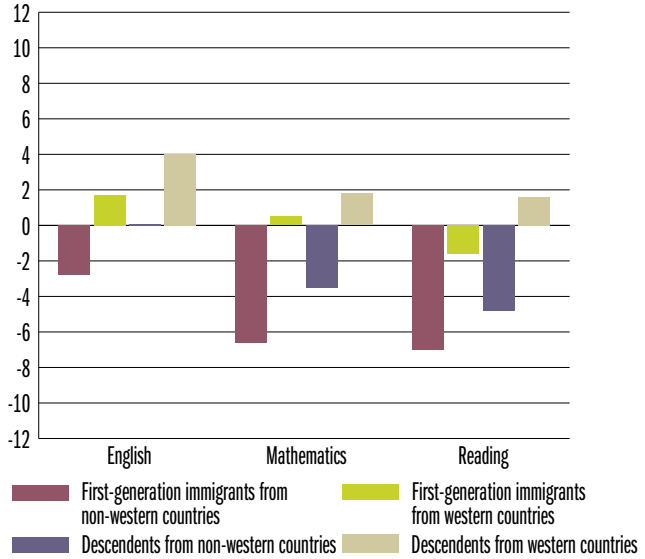
The national tests have a somewhat unequal distribution on the scale for the different skills, and the degree of difficulty can vary somewhat from year to year. Therefore, the test results are standardised so that the results from all of the tests can be employed as a cumulative measurement of results in the analyses. Figure 3.2 shows the average standardised score in English, mathematics and reading in Year 5, for the three years combined. Here, the average standardised score is set equal to 0, with a standard deviation of 10 so that the figure illustrates the groups' achievements above and below the average (the zero point). Figure 3.3 shows the equivalent achievements for Year 8.

Figures 3.2 and 3.3 show that first generation immigrants with a non-western background score lower than average on all three national tests. The analyses show that this applies to all three years and to both Years 5 and 8. The deviation from the average is greatest in reading and least in English. It is especially boys with a non-western background who score low in reading. Non-western first generation immigrants in Year 8 have a greater deviation from the average than the equivalent group of pupils in Year 5, but until more in-depth analyses have been conducted, it is difficult to tell whether this is an expression of increasing differences between the majority group and pupils with a non-western immigrant background over a period of time or whether it is because we are looking at two different groups of pupils (cohort differences) (Opheim 2010).

Descendents from non-western countries have higher scores than first generation immigrants from these countries, which may indicate that they are in the process of catching up with the majority pupils. First generation immigrants from western countries are close to the average, whereas descendents from western countries score above average. This group scores best in English. However, the group constitutes only 0.3 per cent of the pupils in Years 5 and 8.

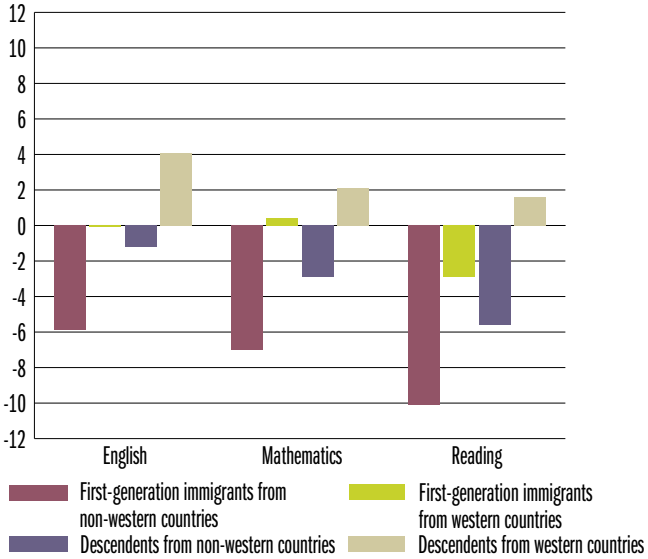
The analyses also show that there is a relationship between residence time in Norway and achievements on national tests. The longer the

Figure 3.2: Achievement levels in English, mathematics and reading by immigrant background. Overall results on the national tests for Year 5 in 2007, 2008 and 2009. Standardised scores.



Source: Opheim 2010

Figure 3.3: Achievement levels in English, mathematics and reading by immigrant background. Overall results on the national tests for Year 8 in 2007, 2008 and 2009. Standardised scores.



Source: Opheim 2010

pupil has lived in Norway, the higher the score on the tests. For the pupils in Year 8, there is a clear distinction between those who arrived in the country before and those who arrived after starting school (at age 6). The latter group is complex, and there is a large spread in the results. It constitutes 60 per cent of all pupils born in non-western countries who took the national tests for Year 8 in 2007, 2008 and 2009. The group consists of both those who came to Norway at the age of seven and those who had only just recently come to Norway when they took the national tests for Year 8.

Differences by the parents' level of education

When the researchers examine the relationship between the parents' level of education and the pupils' results on the national tests for 2007, 2008 and 2009, they find a clear relationship for all of the tests (Næss 2010). Figure 3.4 shows the relationship between the parents' level of education and the pupils' point score on the national tests in Year 8. The point scores are standardised here with an average of 50 and a standard deviation of 10 for each year class of pupils. There is a clear increase in the pupils' point score for each successively higher level of the parents' education from a lower secondary education or less all the way up to research training (a doctoral programme). The importance of the parent's education was somewhat less pronounced in the English test than in the two other tests, whereas the differences between the groups classified by their parents' education were somewhat more pronounced in Year 8 than in Year 5 (not shown in the figure).

3.3 Marks statistics for Year 10 of primary and lower secondary school

In primary and lower secondary school, the pupils are assessed in the subjects starting with Year 8 on a scale of marks from 1 to 6, where 6 is the best mark. National marks statistics from primary and lower secondary school are only collected at the end of Year 10.

Regulations pursuant to the Norwegian Education Act:

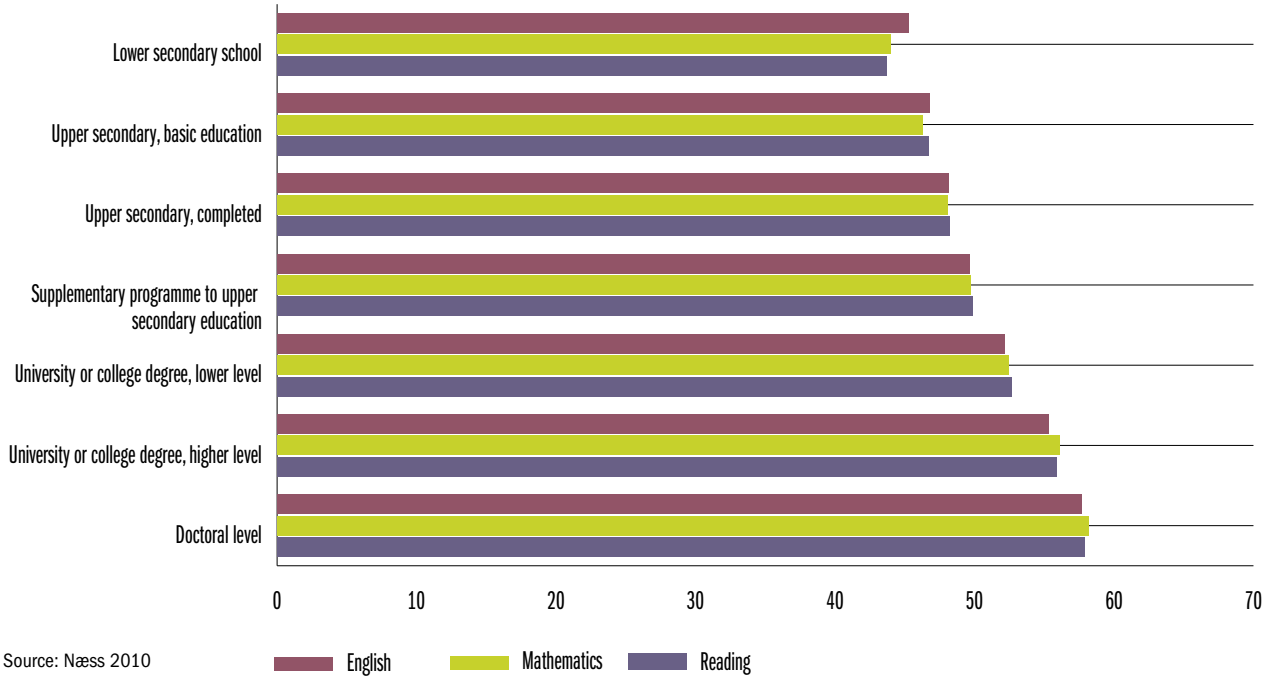
§ 3-4. Subject marks, etc.

Starting in Year 8 and continuing through upper secondary education and training, an assessment shall also be given with numerical marks. Numerical marks on a scale of 1 to 6 shall be used. Only whole numbers shall be used as marks.

The individual marks have the following content:

a) the mark of 6 indicates that the pupil has an exceptionally high degree of competence in the subject
b) the mark of 5 indicates that the pupil has a very high degree of competence in the subject
c) the mark of 4 indicates that the pupil has a high degree of competence in the subject
d) the mark of 3 indicates that the pupil has a fair degree of competence in the subject
e) the mark of 2 indicates that the pupil has a low degree of competence in the subject
f) the mark of 1 indicates that the pupil has a very low degree of competence in the subject.

Figure 3.4: Achievement levels in English, mathematics and reading, by the parents' level of education. Overall results on the national tests for Year 8 in 2007, 2008 and 2009. Standardised scores.



Source: Næss 2010

The pupils who completed Year 10 in 2009 are the second year class that has been finally assessed according to the curricula for the Knowledge Promotion Reform (LK06) in primary and lower secondary school.

At the end of Year 10 of lower secondary school, pupils are as a rule awarded overall achievement marks in 14 subjects. The overall achievement marks are given by the pupils' teachers in the respective subjects. In addition, the pupils are selected to take a written examination and an oral examination. The purpose of the final assessment is to give information about the pupils' competence upon completion of the education in the subject.

The relationship between overall achievement and examination marks

A consistent trend is that the average mark is generally higher for overall achievement than for the written examination, whereas the highest average mark is in the oral examination. Figure 3.5 shows examples of this. In addition, we see that the subjects that do not have a written examination, such as *social sciences*, have higher average overall achievement marks than subjects such as *mathematics* and *Norwegian first-choice form written*.

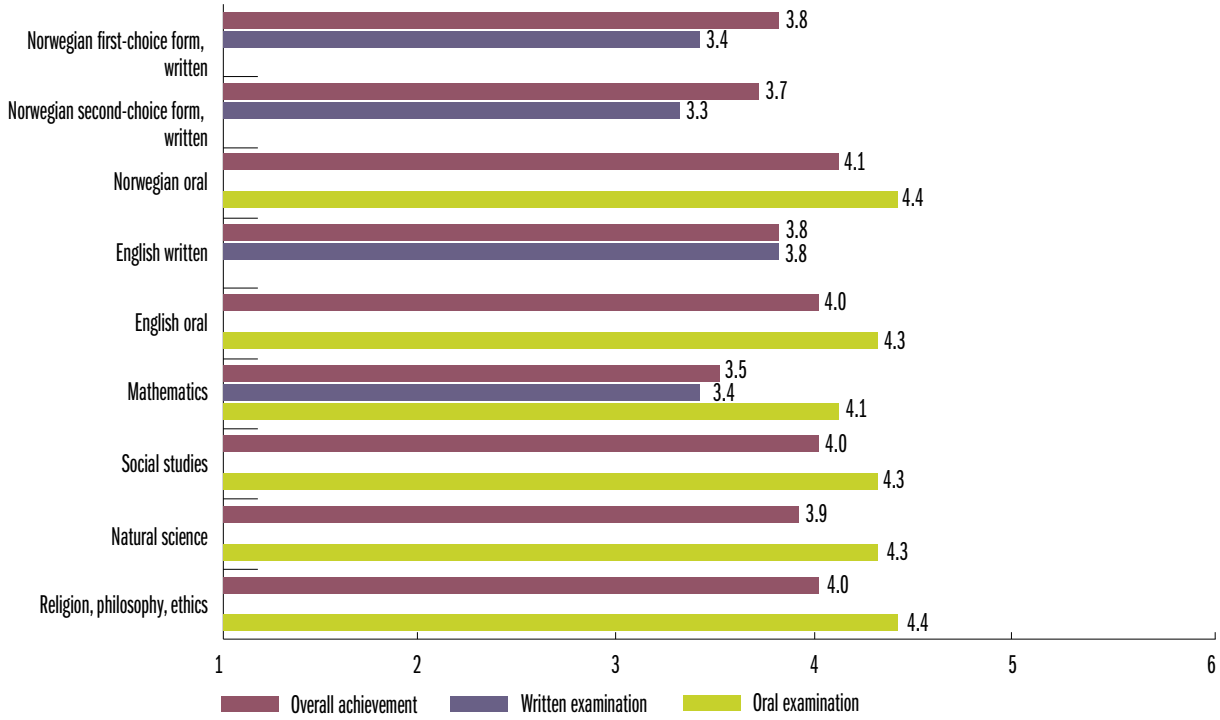
Analyses show that pupils that are selected to take an oral examination consistently receive better marks than they had in overall achievement, whereas pupils who take a written examination consistently achieve poorer results than they had in overall achievement. This is a trend that is equally clear in almost all subjects. It applies to both subjects where the examination candidates number only in double digits and general subjects where many thousand pupils are selected to take the examination (Grøgaard 2010).

Surveys of lower secondary school and upper secondary education and training prior to the introduction of the Knowledge Promotion Reform showed that there were major variations among schools in the grounds for determining overall achievement marks (Dale and Wærness 2006). The curricula for the Knowledge Promotion Reform (LK06) assume goal-oriented or criteria-based assessment principles; i.e. that the teachers shall only assess whether the pupil has achieved the goals that were set for the education and training. The survey of Dale and Wærness showed that many teachers previously combined goal-oriented and individual-related assessment when they determined overall achievement marks, e.g. by letting effort be included in the assessment.

A more recent study (Prøitz and Borgen 2010) shows that the picture is more nuanced now. In an interview study at two upper secondary schools and four lower secondary schools, teachers' practices in determining overall achievement marks in five subjects were studied: *Norwegian, mathematics, natural sciences, arts and crafts / design, arts and crafts*, and *physical education*. The study shows that to a great extent the teachers used results of written tests as the main basis for overall achievement marks, even in the subjects that the teachers themselves characterise as oral subjects, i.e. subjects that do not have a written examination.

Nevertheless, the basis for overall achievement marks varies somewhat from subject to subject. In *mathematics* and *natural sciences,* it is common to base the marks on tests that are marked, and the whole scale of marks from 1 to 6 is used. In *Norwegian* and *arts and crafts / design, arts and crafts,* assessments may be more discretionary. The pupils' achievements or knowledge are assessed there against the competence goals, and the teachers try hard to avoid giving a mark of 1. In *physical education,* it is common to make use of several methods, e.g. tests, documentation of self-training periods and assessment of attendance and effort.

Figure 3.5: Overall achievement marks and examination marks in subjects that have an oral and/or written examination for pupils in Year 10 in the 2008-2009 school year. Average.



Source: The Norwegian Directorate for Education and Training/VIGO

In general, the teachers emphasise the pupils' achievements and knowledge when determining overall achievement marks. However, the importance attached to the pupils' participation varies. Attendance, effort and attitudes are emphasised in all subjects for academically weak pupils, but not for the academically strong pupils. *Physical education* is an exception, where achievement, knowledge and attendance are emphasised for all pupils.

Marks and gender differences

Analyses show that girls receive higher marks than boys in most subjects, from 0.3 to 0.6 points higher (The Norwegian Directorate for Education and Training 2009a). This applies to both overall achievement and examination marks. There are consistently more girls than boys who get high marks (4 or higher) and fewer girls than boys who get low marks (3 or lower). The exception is *physical education,* where the boys average 0.2 points higher than the girls. On average, the girls also get better marks in *mathematics* than the boys, but the gender differences here are not as great as in the other subjects.

The examination marks in *written Norwegian, first-choice form* in figure 3.6 show how the percentage of girls and boys are distributed among the different levels of marks in most of the subjects (except *mathematics* and *physical education*).

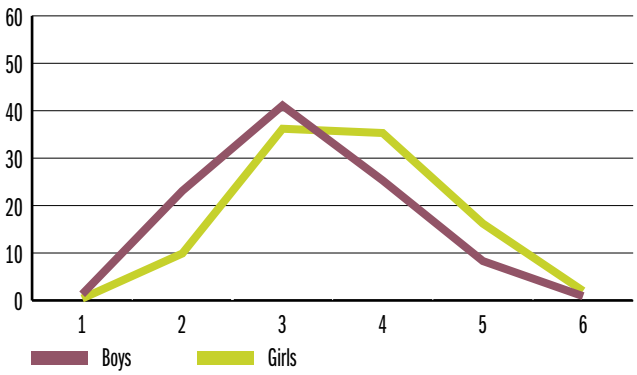
Marks and the parents' level of education

There are big differences in the pupils' examination results according to the parents' highest level of education, as shown in figure 3.7 (Grøgaard 2010). Especially in *written Norwegian, first-choice form*, *mathematics* and *English,* the pupils with the least educated parents had the poorest examination results, whereas the pupils with the best educated parents had the best examination results. Exceptions are the subjects *French, German* and *Spanish*, in which many pupils with poorly educated parents have among the best achievements in primary and lower secondary school.

Lower secondary school points

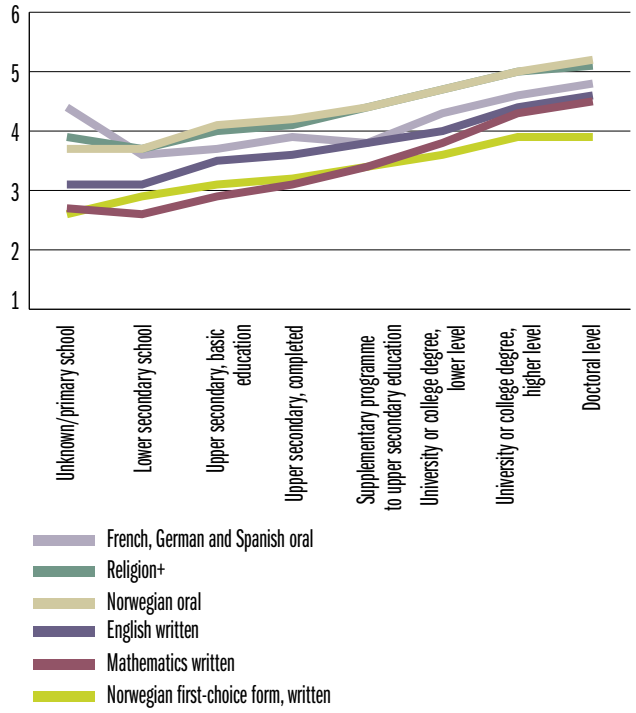
Upon completion of Year 10 in the spring of 2009, about 90 per cent of the pupils had 15 marks or more. The most commonly registered reason why pupils lack marks in certain subjects is that they were exempted from marks in the subject, but for many of the pupils no reason is given. Lower secondary school points are not calculated for pupils with fewer than eight marks. At least 80 per cent of the pupils who have a zero in lower secondary school points lack marks in the subjects with the greatest scope in the primary and lower secondary school, namely *Norwegian, mathematics* and *English* (Grøgaard 2010).

Figure 3.6: Distribution of examination marks in the first-choice form of Norwegian, written examination in Year 10 in the 2008-2009 school year. Boys and girls.



Source: The Norwegian Directorate for Education and Training/VIGO

Figure 3.7: Examination marks in selected subjects in Year 10 in 2009 by the parents' highest level of education. Average.



Source: Grøgaard 2010

Average lower secondary school points for the whole country for 2009 came to 39.5, cf. table 3.2. In 2009, girls had an average of 3.9 more lower secondary school points than boys.

Average lower secondary school points for pupils in private schools were three points higher than for pupils in public schools in 2009, cf. table 3.2. Differences in achievement between private and public schools may be attributed to differences in the composition of pupils with regard to socio-economic background as shown in the analyses of the international studies (Haahr et al. 2005). The differences in lower secondary school points between the genders are also smaller at private primary and lower secondary schools.

There is a significant relationship between the level of achievement as measured by lower secondary school points and the pupils' socio-economic background (Grøgaard 2010). The pupils' results increase fairly smoothly and systematically along the whole scale of the parents' level of education, and both the mother's and father's levels of education are related to the pupil's achievements in Year 10. Pupils with parents who have an unknown level of education or primary school as their highest education have the lowest average lower secondary school points and the largest percentage with 0 points. Pupils with parents who have research training (a doctoral programme) have the highest average number of lower secondary school points.

There is also a relationship between lower secondary school points and the pupils' immigrant background. Figure 3.8 shows average lower secondary school points according to the pupils' immigrant background. Pupils with 0 lower secondary school points are included in the analyses, which gives a slightly lower average than that which is shown in table 3.2. On average, western descendents have the highest lower secondary school points, followed by the majority population, whereas descendents in general achieve better than first generation immigrants, who have the lowest average lower secondary school points.

What are lower secondary school points?

Section 6-15 of the Regulations relating to the Education Act.

Marks from the primary and lower secondary school:
Lower secondary school points are a cumulative measure of the pupils' marks in subjects at the end of Year 10 of primary and lower secondary school. Lower secondary school points are calculated by adding the final numerical marks in all of the subjects, both examination marks and overall achievement marks, a total of 16 marks. This total is then divided by the number of marks. This average, with two decimals, is then multiplied by 10. Lower secondary school points are not calculated for pupils with fewer than eight marks altogether.

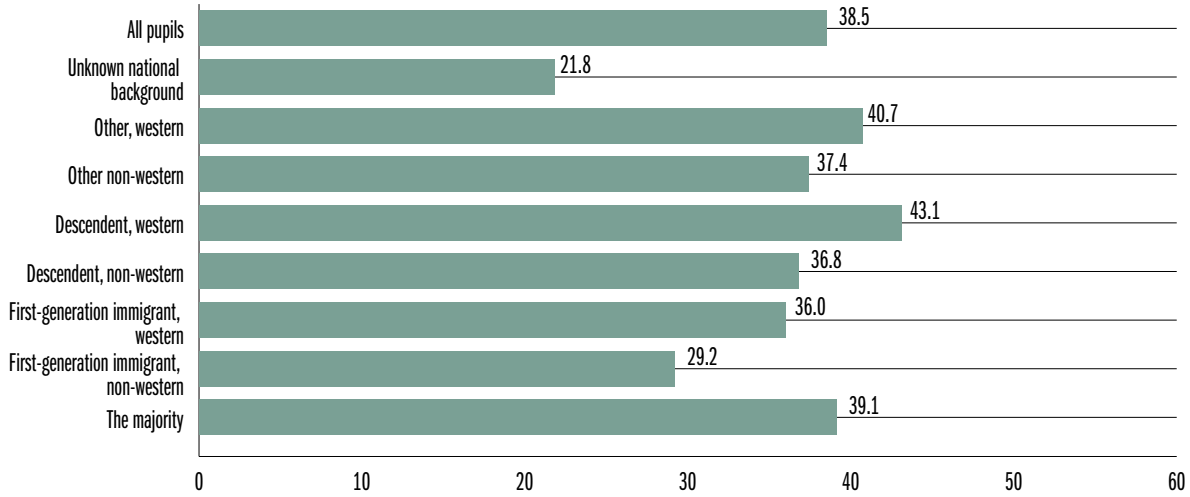
The subjects that the pupils must have marks in are *Norwegian first-choice form written, Norwegian second-choice form written, Norwegian oral, English written, English oral, mathematics, foreign language or in depth language studies, arts and crafts, physical education, food and health, music, natural science, social studies* and *religion, philosophy and ethics* (The Norwegian Directorate for Education and Training, 2009b).

Table 3.2: Lower secondary school points and number of pupils in 2009, by gender and the school's ownership.

	Number of pupils			Average lower secondary school points		
	All	Boys	Girls	All	Boys	Girls
All schools	60 554	30 769	29 785	39.5	37.6	41.5
State	59 226	30 110	29 116	39.5	37.6	41.4
Private	1 328	659	669	42.5	41.1	43.9

Source: The Norwegian Directorate for Education and Training/VIGO

Figure 3.8: Lower secondary school points in 2009 by the pupils' immigrant background. Average.



Source: Grøgaard 2010

3.4 Marks statistics for upper secondary education and training

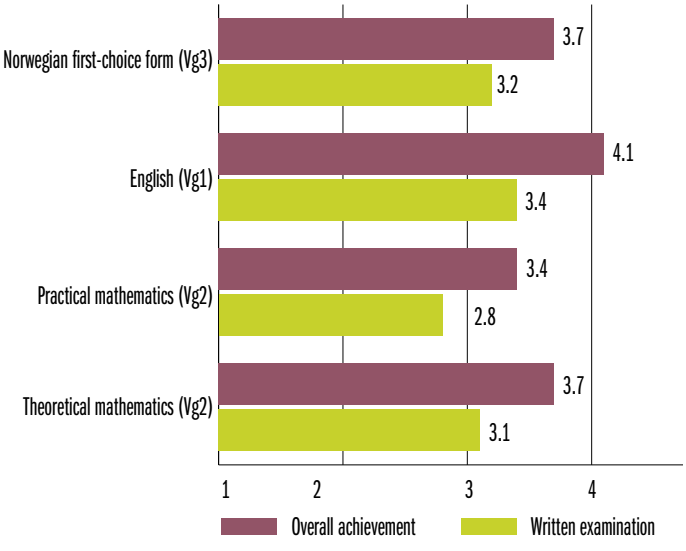
Pupils in upper secondary education and training receive overall achievement marks in final subjects and examination marks in some of the final subjects if they are selected for examination. Different subjects are completed in different Years, and the date for completion also varies for general studies and vocational education programmes. Starting in the spring of 2007, the assessment scale in upper secondary education and training ranges from 1 to 6, with 6 being the highest mark. The marks 2-6 are regarded as passing marks. If the pupils pass an examination in a subject, they pass the subject even if they had not passed with their overall achievement mark.

The mark statistics after the introduction of the Knowledge Promotion Reform (KL06) encompass a large number of subjects from 12 different education programmes. The composition of pupils varies among the different subjects. Due to the broad scope of the data for marks in upper secondary education and training, the mark statistics are only shown here for a few selected subjects with a large scope and a final examination.

Marks in common core subjects

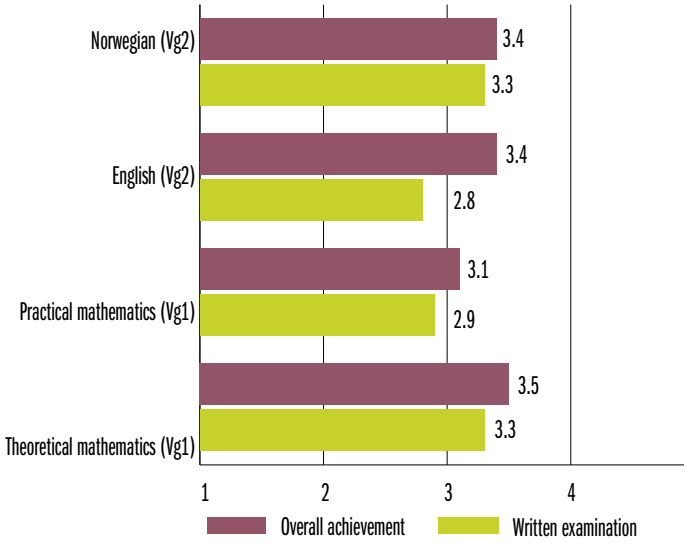
Figures 3.9 and 3.10 show that there is a relatively big difference between overall achievement marks and examination marks in the common core subjects *Norwegian, English* and *mathematics*. The overall achievement marks are consistently higher than the marks in written examinations. The difference is especially big in *English*. We also see that the difference between overall achievement and examination marks is greater in the general studies education programmes than in the vocational programmes: the difference in the general studies programmes is a half point or more in all of the listed subjects.

Figure 3.9: Overall achievement marks and written examination marks at the final level in selected common core subjects from general studies education programmes in the 2008-2009 school year. Average.



Source: The Norwegian Directorate for Education and Training/VIGO

Figure 3.10: Overall achievement marks and written examination marks at the final level in selected common core subjects from vocational education programmes in the 2008-2009 school year. Average.



Source: The Norwegian Directorate for Education and Training/VIGO

What are common core subjects?

Common core subjects are compulsory subjects that are taught at each Year of education and training in school, e.g. *Norwegian, English, mathematics* and *natural sciences*. Most common core subjects are general subjects; i.e. they have a common curriculum in primary and lower secondary school and in upper secondary education and training. The common core subjects are often completed in different Years in the general studies and vocational education programmes.

Source: www.vilbli.no og www.udir.no/grep

The average mark for overall achievement in the selected subjects is consistently higher in the general studies education programmes than in the vocational ones. The difference is not as decisive in the examination marks. The basis for assessment in the common core subjects in the general studies and vocational education programmes is different because the pupils follow different curricula or shall achieve different competence goals in most subjects. *English* common core subjects are the only selected subjects where the pupils in general studies and vocational education programmes follow the same curriculum and have the same written examination and who therefore are directly comparable. The figures also show that the pupils in general studies education programmes have higher average examination marks in this subject than the pupils in vocational education programmes.

Girls get higher overall achievement marks than boys in most of the common core subjects. This applies to both general studies and vocational education programmes. The biggest gender differences are in *Norwegian* and in the foreign languages, whereas there is very little difference in *English*. The gender differences in most of the common core subjects are less for the examination marks than for the overall achievement marks. In *mathematics* (practical variant) in Vg2 general studies education programmes, girls get higher marks than boys in overall achievement, whereas the boys do better than the girls on the examination. The overall achievement marks for boys and girls in a selection of common core subjects is shown in figure 3.11.

Marks in programme subjects

Figure 3.12 shows that there are big differences between overall achievement marks and examination marks for the programme subjects in general studies education programmes as well. In all of the selected subjects, the average overall achievement marks are clearly higher than the examination marks, in several subjects by as much as 0.7 points.

The gender differences manifest themselves for the programme subjects in the same way as for the common core subjects. In the general studies programme subjects, it is particularly in *mathematics* and *biology* that the girls have higher marks than the boys, both in overall achievement and on the examination. The girls also have better results than the boys in *mathematics R2* and *physics 2*. There have traditionally been many more boys than girls who choose these subjects, especially *physics*. On the examination in *chemistry 2* and in *social English,* however, the boys did better than the girls.

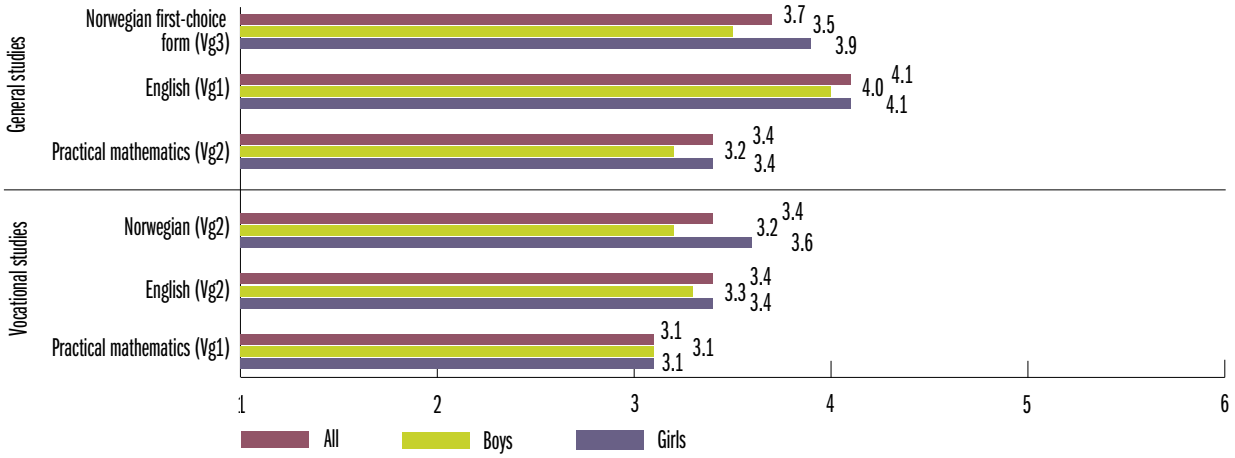
In Vg2 in the vocational education programmes, the pupils in most of the programme areas have two or three common core programme subjects in which they are given overall achievement marks at the end of the school year. In addition, the pupils must take an interdis-

What are programme subjects?

Programme subjects are special subjects for an education programme or a programme area. In vocational education programmes, the programme subjects are common for all pupils in the same programme area. In the education programme for specialisation in general studies, it is required that the pupils take in-depth study in programme subjects within their own programme area, and there are particular requirements for the choice and composition of subjects. In the education programmes for sports and physical education, music, dance and drama and specialisation in general studies with arts, crafts and design studies, certain programme subjects are common to all pupils in Vg1, Vg2 and Vg3.

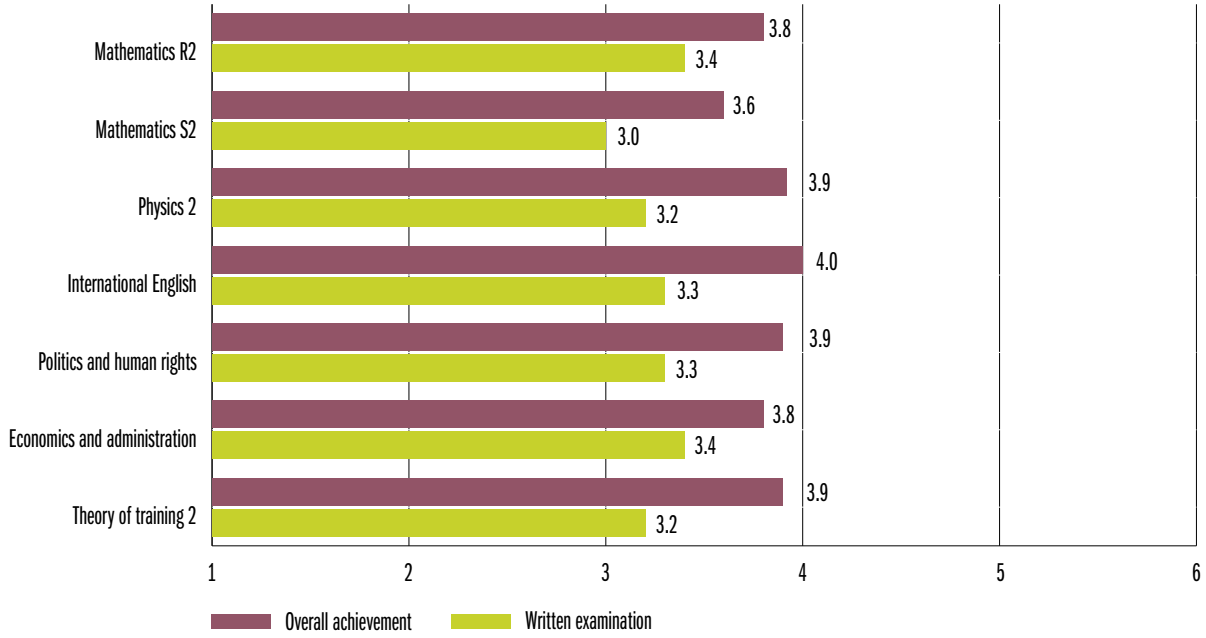
Source: www.vilbli.no og www.udir.no/grep

Figure 3.11: Overall achievement marks in final level in selected common core subjects in the 2008-2009 school year. Boys and Girls.



Source: The Norwegian Directorate for Education and Training/VIGO

Figure 3.12: Overall achievement marks and written examination marks in selected programme subjects from general studies education programmes in the 2008-2009 school year. Average.



Source: The Norwegian Directorate for Education and Training/VIGO

ciplinary examination that tests achieved competence in all of the common core programme subjects in the programme area.

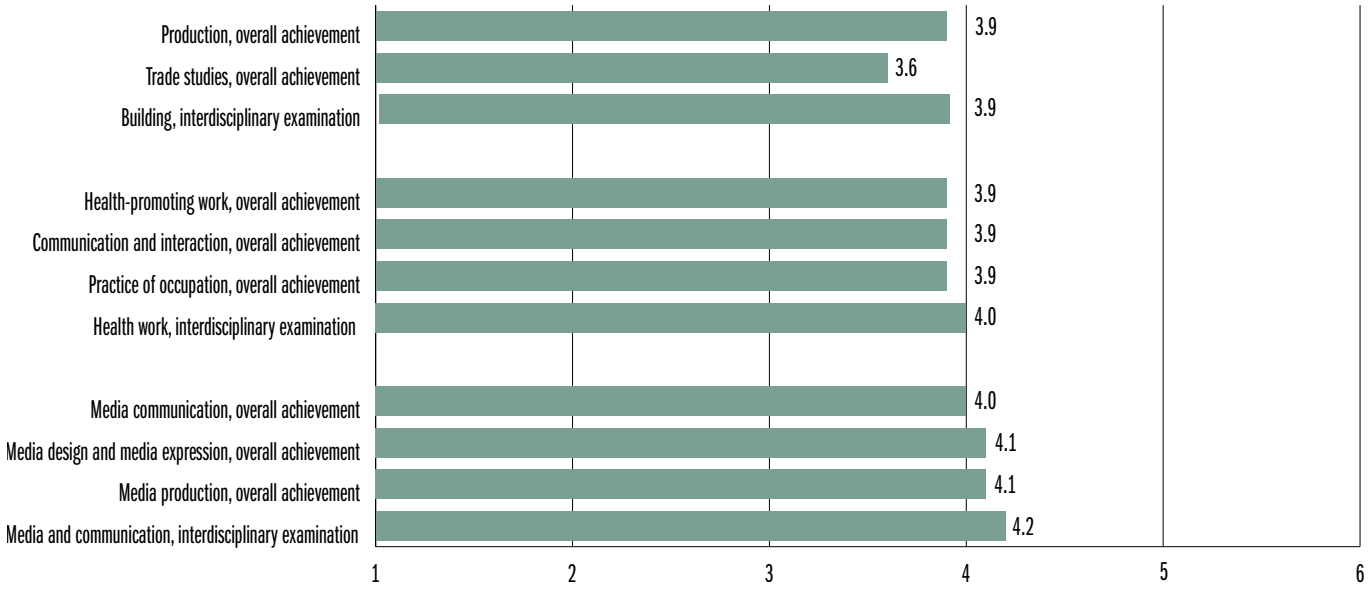
As figure 3.13 shows, we do not find the same difference between overall achievement and examination marks in the vocational programme subjects as we did in the general studies programme subjects. In the selected programme areas *electrical power*, *health work* and *media and communication,* the interdisciplinary examination mark is just as high or higher than the overall achievement mark in each of the programme subjects.

3.5 Results from craft and journeyman's examinations

In the following section, results from completed craft and journeyman's examinations are reviewed. Chapter 5 presents a more detailed discussion of pupils and apprentices' application and admission to and completion of upper secondary education and training.

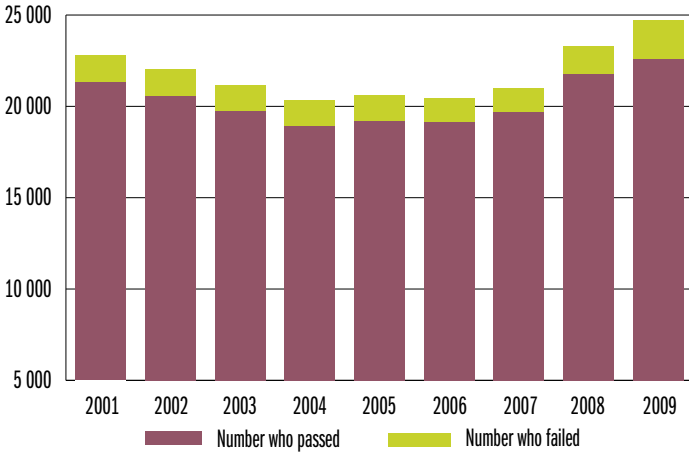
The framework conditions for vocational education and training are determined by the state authorities. The counties are responsible for approval of training establishments and have overall responsibility for

Figure 3.13: Overall achievement marks and interdisciplinary examination marks in common core programme subjects from selected programme areas in vocational education programmes in the 2008-2009 school year. Average.



Source: The Norwegian Directorate for Education and Training/VIGO

Figure 3.14: Apprentices who have taken the craft or journeyman's examination broken down by whether they passed or failed in the period from 2001 to 2009. Number



Source: VIGO/Statistics Norway

ensuring that the education and training are carried out in accordance with the curricula.

The final test in vocational education and training is the craft or journeyman's examination. This is a test where candidates plan their work, choose their methods, carry out, control and document their work and substantiate their choices. The test consists of the following three parts:

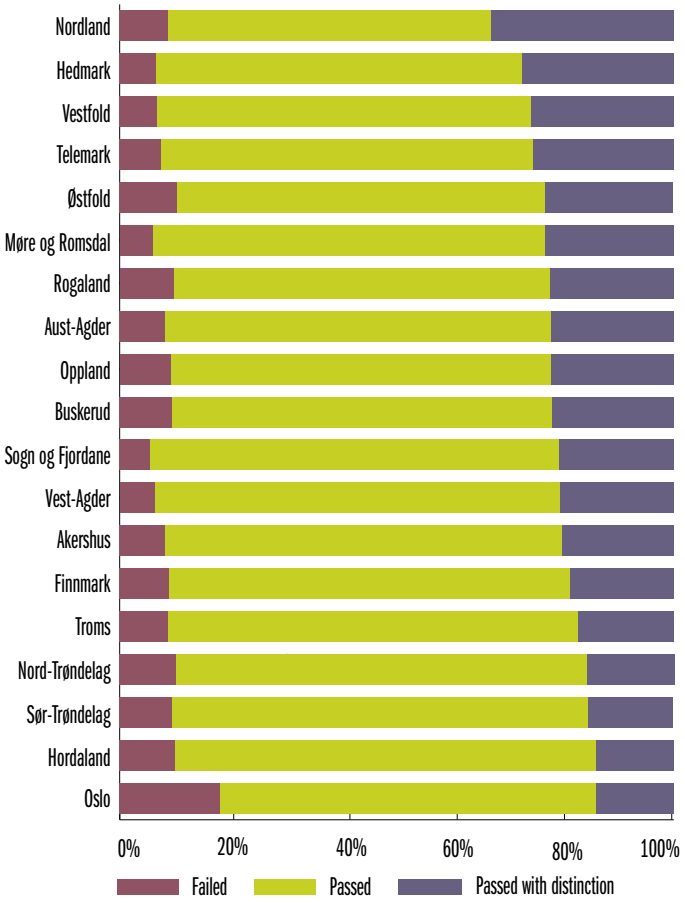
- Planning
- Implementation
- Documentation

All three parts count in the assessment. The duration of the test can be from two to five days, depending on the subject. The assessment is carried out by an examination board with members who have no connection with the training establishment. The test is marked as passed with distinction, passed or failed. (Official Norwegian Report [NOU] 2008: 18 Fagopplæring for framtida [Vocational education and training for the future]).

The first apprentices to complete upper secondary education and training in the set time in the Knowledge Promotion Reform will be finished in the spring of 2010. Already in 2008 and 2009, however, a few of them took examinations pursuant to this scheme because they have an opportunity to take an examination before the whole apprenticeship is completed. However, most of the results from the vocational education are still for pupils who have had their education and training after Reform 94.

In 2009, nearly 21,500 persons took the examination. About 19,500 (91.5 per cent) of them passed the examination. In the period from 2001 up to and including 2009, the number of persons who have taken the examination has varied. The lowest registered number was in 2004 and the highest was in 2009 (cf. figure 3.14). The percentage of those who have passed during the same period varied from a high of about 93 per cent in 2006 and 2007 to a low of about 91 per cent in 2009.

Figure 3.15: Apprentices who have taken the craft or journeyman's examination broken down by the percentage who failed, passed and passed with distinction in 2009



Source: Statistics Norway

The percentage who passed was the same for boys and girls in 2009 (Statistics Norway/VIGO). For the three previous years, the percentage of boys who passed was marginally higher than the percentage of girls. The percentage difference between boys and girls has varied from 0.5 to 1.5 (The Education Mirror 2008).

In recent years, the reporting of pupils who have passed the craft and journeyman's examinations has distinguished between passed and passed with distinction. In 2009, the percentage who passed with distinction was slightly less than 21 per cent of the total, whereas this percentage had been slightly less than 22 per cent the year before.

For 2009, we see that Nordland County had the highest percentage of apprentices who passed with distinction, whereas Oslo and Hordaland County had the lowest percentage of apprentices who passed with distinction (figure 3.15). In 2008, Nordland was also on top with the highest percentage who passed with distinction (nearly 34 per cent), and Oslo was the county with the lowest percentage who passed with distinction (14 per cent). In 2009, Oslo had the highest percentage of pupils who took but failed the craft and journeyman's examinations, 18 per cent. In 2008, Oslo also had poor results for vocational education and training with 19 per cent who did not pass the examination.

3.6 Norwegian pupils' competence in physics and mathematics – TIMSS Advanced 2008

Norway takes part in a number of international studies of the school systems in various countries, where a key element is measuring the pupils' competence in individual subjects or areas. Participation in these studies enables us to compare the Norwegian pupils' competence with that of pupils in other countries.

The most important reason why Norway should take part in the international studies is that these studies are the only ones that measure Norwegian school pupils' competence level over a period of time. Neither marks nor the national tests are designed in such a way that they measure an improvement in or a worsening of the level of Norwegian primary and secondary education and training. For that reason, the international studies are crucial in making it possible to assess whether policy efforts give results in the form of better learning outcomes among the pupils.

It is an express policy goal to educate skilful scientists and technologists at a high academic level (The Ministry of Education and Research 2010). TIMSS Advanced is the only study conducted in Norway that measures Norwegian pupils' competence level in upper secondary education and training in comparison with other countries and over a period of time. Pupils who choose in-depth study in the natural sciences in upper secondary education and training are our nation's potential candidates for higher education in the sciences, technology and medicine.

The results from TIMSS Advanced 2008 cannot be linked to the introduction of the Knowledge Promotion Reform. The Norwegian pupils who took part in TIMSS Advanced 2008 have mainly followed the curricula for L97 in primary and lower secondary school and R94 in upper secondary school, and they have chosen full in-depth study in mathematics 3MX (theoretical) and/or physics 3FY in their last year of upper secondary school. Mathematics and physics problems in TIMSS Advanced 2008 are in good accordance with the content of Norwegian curricula for these subjects after Reform 94.

TIMSS Advanced examines the school systems in the participating countries at three levels. This is illustrated in figure 3.16. First the study describes the various countries' formal curricula (the intended curriculum), then it examines what happens in the instruction (the implemented curriculum) and finally it tests the pupils' competence in mathematics and physics (the attained curriculum).

TIMSS Advanced 2008 (Trends in International Mathematics and Science Study – Advanced) measures competence in mathematics and physics of pupils who have chosen full in-depth study in these subjects in upper secondary school. The study was carried out in 2008 by the International Association for the Evaluation of Educational Achievement (IEA). The Norwegian part of the study was conducted by the Department of Teacher Education and School Development (ILS) at the University of Oslo.

The TIMSS Advanced study measures the trend since 1995, but in 1995 Norway only took part in the physics part of the study. However, Norwegian pupils were tested in mathematics in 1998 with the same testing procedure as in 1995 so that changes in pupils' competence in mathematics were also measured for Norwegian pupils from 1998 to 2008, and this is presented in the Norwegian TIMSS Advanced report (Grønmo et al. 2010).

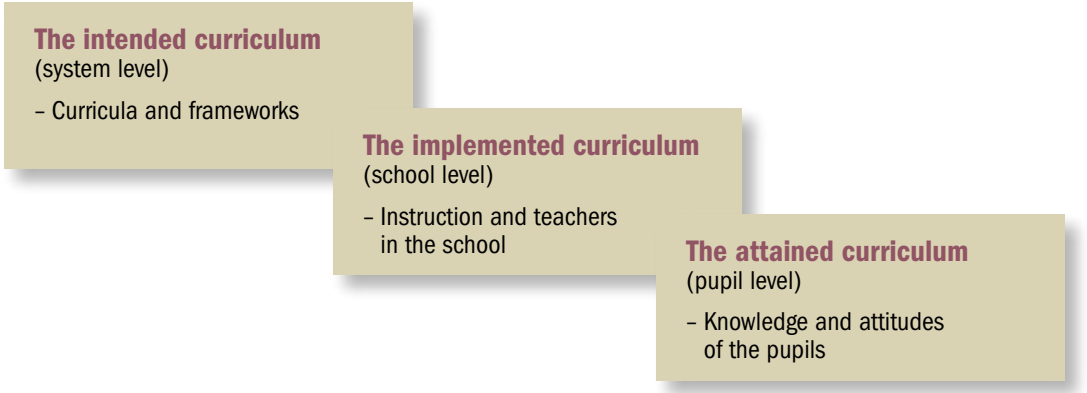
Performance in mathematics in TIMSS Advanced 2008

A total of 10 Asian and European countries took part in TIMSS Advanced 2008. The possibilities for comparison with other countries are rather limited relative to TIMSS for primary and lower secondary school in which 60 countries took part.

The number of years the pupils have attended school, the pupils' age, and the percentage of the relevant age group in each country who take in-depth study in mathematics (coverage index) in upper secondary education and training are significant with regard to the pupils' outcomes. The variations from country to country with regard to these factors are greater in TIMSS Advanced than in equivalent studies from primary and lower secondary school. This must be taken into consideration when we interpret the results.

Table 3.3 shows average scores for the mathematics results for the 10 participating countries in TIMSS Advanced 2008. Norway's average score is 439 and is clearly below the international scaled average of 500 (a standard that was set in 1995). Taking into consideration

Figure 3.16: The three levels in the study of the curriculum in the participating countries in TIMSS Advanced 2008.



Source: Lie et al. 2010, Grønmo et al. 2010

Competence levels in mathematics

Advanced level (625 points)
The pupils show that they have a grasp of concepts and master procedures. They demonstrate an ability to reason in algebra, trigonometry, geometry and differential and integral calculus and use this knowledge to solve problems in complex situations.

High level (550 points)
The pupils can use their knowledge of mathematical concepts and procedures in algebra, calculus, geometry and trigonometry to analyse and solve both routine and non-routine multi-step problems.

Intermediate level (475 points)
The pupils can use their knowledge of concepts and procedures in algebra, calculus and geometry to solve routine problems.

Low level (less than 475 points)
The pupils have not achieved an intermediate level of competence. This may mean, for example, that they cannot perform basic algebraic operations, that they cannot derive simple functions or that they cannot add and subtract vectors in coordinate form.

that only about 11 percent of the age cohort chose full theoretical in-depth study in mathematics in Norway, whereas 40 per cent of the age cohort in Slovenia had done so, the Norwegian results must be regarded as very poor. In Norway, there has been a decline of about one percentage point since 1998 in the percentage of pupils who have chosen full in-depth study in theoretical mathematics.

In most countries, the boys have somewhat better results in mathematics than the girls. As far as Norway is concerned, there are no significant differences between the boys' and the girls' results, but it can be seen in table 3.3 that a lower percentage of girls (38 per cent) than boys take full in-depth study in theoretical mathematics in upper secondary school in Norway.

Figure 3.17 shows the relationship between the coverage index and the countries' mathematics scores. In the Russian Federation, which had the highest average score, only 1.4 per cent of the age cohort in the TIMSS Advanced study had received advanced mathematics education, compared with fully 40.5 per cent in Slovenia. If you take that into consideration, you can argue that Slovenia is the country that does best in mathematics at the end of upper secondary school even though the country lies significantly below the scaled average. Advanced mathematics in the Russian Federation appears to be a subject for a small group of elite students who achieve quite a high level of competence at a young age. In Slovenia, mathematics appears to be more like an important general subject that pupils take in upper secondary school.

Advanced, high and intermediate levels of competence are the three levels that are defined and described in the international TIMSS Advanced report (Mullis et al. 2009). These levels of competence are linked to specific scores, cf. text box. If a pupil scores lower than 475 points, the Norwegian researchers have defined that as a low level of competence (Grønmo et al. 2010). They describe what that level entails more specifically because the majority of the Norwegian pupils scored at that level, cf. text box.

Only one per cent of Norwegian pupils attained an advanced level of competence in *mathematics*, eight per cent scored at a high level, 26 per cent scored at an intermediate level, while fully 65 percent scored at a low level. To a great extent, the poor results are in accordance with the results for Years 4 and 8 for the primary and lower secondary school pupils in TIMSS 2007 (Grønmo and Onstad 2009).

The total length of the horizontal bar graph in figure 3.18 shows the percentage of the age cohort that is included in the population that was tested. The difference between 100 per cent and the length of the bar shows the percentage of the age cohort who did not take advanced mathematics in each individual country.

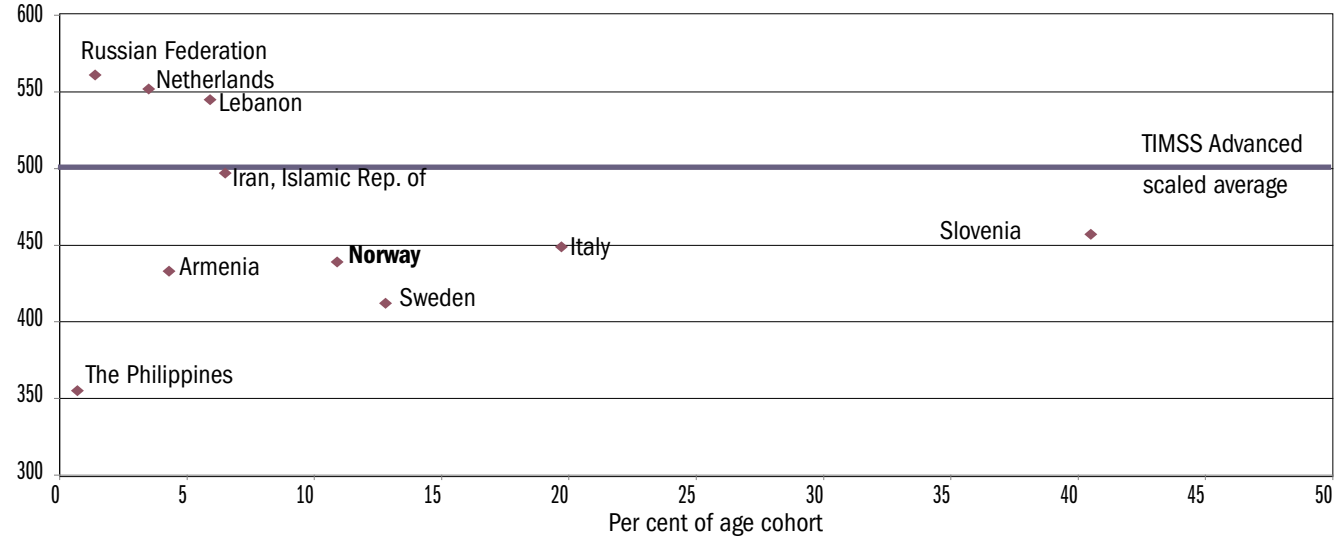
Of all the pupils who take advanced mathematics, the Netherlands has the highest percentage at the advanced level. Since the Nether-

Table 3.3: Average achievement score in mathematics for the countries that took part in TIMSS Advanced 2008 and the percentage of girls who have chosen advanced mathematics.

	Average achievement score	Percentage of age cohort	Age	Years of formal schooling	Percentage of girls
Russian Federation	561	1.4	17.0	10/11	45
Netherlands	552	3.5	18.0	12	23
Lebanon	545	5.9	17.9	12	29
TIMSS Adv. scaled average	**500**				
Iran, Islamic Rep. of	497	6.5	18.1	12	44
Slovenia	457	40.5	18.8	12	60
Italy	449	19.7	19.0	13	34
Norway	**439**	**10.9**	**18.8**	**12**	**38**
Armenia	433	4.3	17.7	10	52
Sweden	412	12.8	18.8	12	40
Philippines	355	0.7	16.4	10	63

Source: Mullis et al. 2009

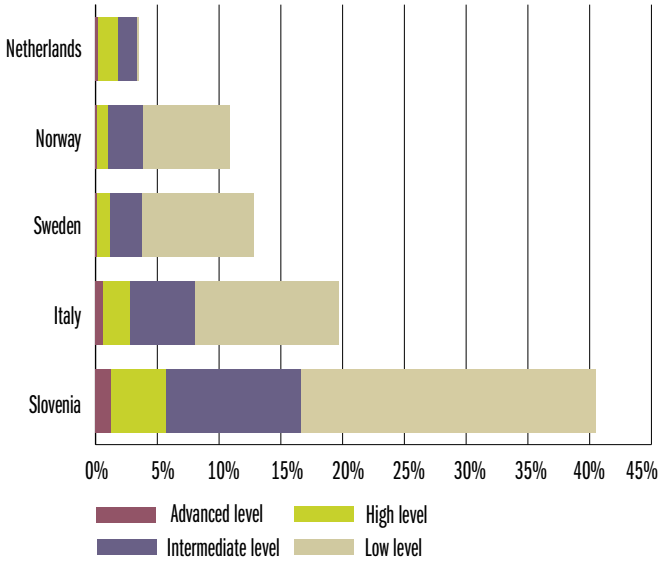
Figure 3.17: Average achievement score in mathematics for the countries that took part in TIMSS Advanced 2008, by the percentage of the age cohort who have chosen advanced mathematics (coverage index).



Source: Mullis et al. 2009

lands has a low coverage index, however, the pupils at the advanced level constitute a very low percentage of their entire age cohort. Slovenia has the highest percentage of the age cohort at the advanced level. We see the same tendencies in the results for pupils with a high level of competence. Of the five countries that are included in figure 3.18, Slovenia is the one that clearly produces the most highly competent mathematicians in upper secondary school, measured relative to the size of the population. It is just as clear that Norway and Sweden do worst among the five countries with the fewest pupils at a high or advanced level relative to the size of the age cohort. Problems are given in three subject areas in TIMSS Advanced: algebra, calculus (mainly differential and integral calculus) and geometry. Norwegian pupils had their best results in geometry and their worst in calculus, but are under the international average in all three areas.

Figure 3.18: The distribution of pupils by competence level in mathematics in TIMSS Advanced 2008. Percentage of the whole age cohort.



Source: Grønmo et al. 2010

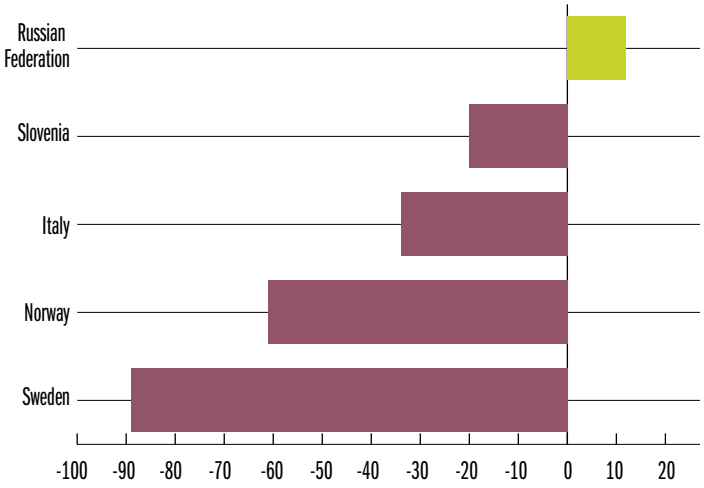
Change in the pupils' competence in mathematics over the last 15 years

Taken in context, there has been a consistent and quite steady decline from the 1990s to the present in all of the international studies (TIMSS, PISA and PIRLS) for all relevant measurements of knowledge that were made with a high level of quality. Regardless of subject or year of schooling, Norwegian pupils had poorer results throughout the 2000s than in previous years, but there are signs of improvement in the results in mathematics from TIMSS 2007, especially for the youngest pupils (Year 4) (Grønmo and Onstad 2009).

Figure 3.19 shows the changes in performance for pupils who have chosen full in-depth study in *mathematics* in Norway and in the other countries where we have data from the previous TIMSS Advanced study from 1998 for Norway and from 1995 for the other countries. Bars to the right indicate improvement in performance from 1995 to 2008, whereas bars to the left indicate a decline during the same period. The margin of error varies somewhat from country to country, but lies for the most part around 10 points for the countries that took part in 1995. Norwegian pupils have undergone a clear decline in mathematics ability from 1998 to 2008. Sweden and Norway are the two countries that have the most marked declines relative to the measurements in mathematics in the TIMSS Advanced study in 1995/1998 (Grønmo et al. 2010).

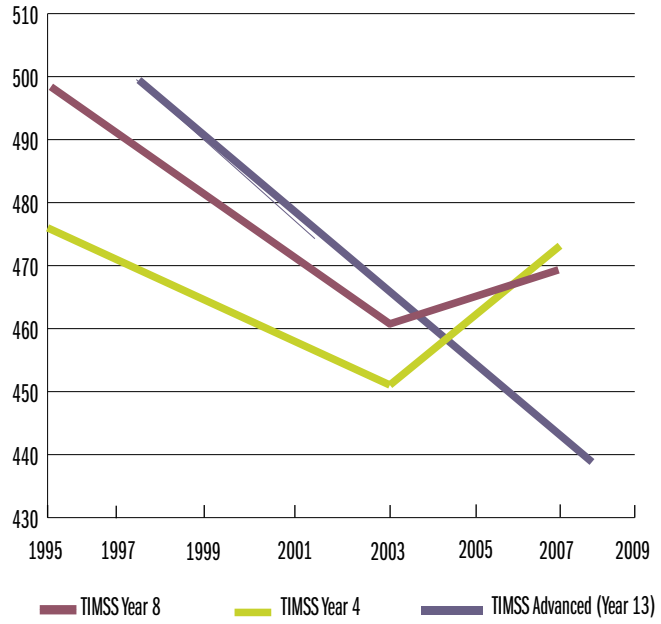
The picture we get of the trend in the pupils' learning outcomes in mathematics in the last 15 years is that there is a general tendency toward poorer knowledge of mathematics among Norwegian pupils in both primary and lower secondary school and upper secondary school, cf. figure 3.20. It is relevant to discuss this clear decline in the Norwegian 3MX pupils' outcomes from 1998 to 2008 in light of the trend in performance in primary and lower secondary school as well. The Norwegian mathematics pupils in 3MX score clearly below the international average of 500, and they generally perform worse than pupils in most of the Asian and European countries. The same is true of Norwegian pupils in Years 4 and 8 of primary and lower

Figure 3.19: Change in mathematics scores for pupils in the last Year of upper secondary school. The period from 1995 (1998 in Norway) to 2008.



Source: Grønmo et al. 2010

Figure 3.20: Change in achievement in mathematics for Norway for Years 4 and 8 and the last Year of upper secondary school in the TIMSS studies 1995-2008.



Source: Grønmo et al. 2010

secondary school. It is worth noting that the age cohort of pupils that was studied in TIMSS in Year 8 in 2003 is the same age cohort that was studied in TIMSS Advanced in 2008.

When the negative trend in the pupils' level of achievement reversed somewhat for the primary and lower secondary school pupils in 2007, it was pointed out (Grønmo and Onstad 2009) that this could be partly explained by the increased attention and efforts to improve the pupils' achievements after the poor results found in TIMSS and PISA 2003 (Grønmo et al. 2004, Kjærnsli et al. 2004). In the Norwegian report from TIMSS 2007, the following possible reasons for a slight improvement from 2003 to 2007 were noted:

- Considerable attention to poor results in both TIMSS and PISA in 2003
- Political agreement about increased efforts to improve knowledge in the schools
- Increased attention to the importance of a sound knowledge of mathematics
- Introduction of national tests with the aim of increasing the pupils' knowledge
- Increased number of periods of mathematics in Years 1-4 of primary and lower secondary school
- A slight increase in continuing education of teachers
- A slight increase in the teachers' follow-up of homework

Performance in physics in TIMSS Advanced 2008

The framework for TIMSS Advanced in physics is built up around two dimensions. One is the content dimension, which deals with academic topics, and the other is a cognitive dimension, which deals with skills and processes.

Table 3.4 shows that the Netherlands has the highest score (582) relative to the scaled average. Norway's result of 534 points is relatively good compared with the other countries, but it is still a decline from 1995, when Norway was the country with the highest score of all of the countries that took part in the study.

The number of years the pupils have attended school, the pupils' age, and the percentage of the relevant age group in each country who take in-depth study in physics in upper secondary education and training are significant with regard to the pupils' results. In all of the participating countries, there is a significantly lower percentage of pupils who have chosen full in-depth study in physics (3FY) than in mathematics. In the Russian Federation, only 2.6 per cent of the age cohort took advanced physics, whereas Sweden had the highest percentage, 11 per cent. In Norway, a little less than seven per cent of the age cohort took the physics course 3FY in the 2007-2008 school year. That is a decline of a little over one percentage point since 1995.

Boys do significantly better than girls in physics. In addition, well over twice as many boys as girls choose the physics course 3FY.

The physics problems in the study are in good accordance with the content of the Norwegian curriculum for the subject that was in effect in 2008 (R94). Problems are given within four subject areas: mechanics, electricity and magnetism, heat and temperature and atomic and nuclear physics. Norwegian pupils have relatively good results in mechanics and electricity and magnetism, but poorer results in atomic and nuclear physics compared with the other countries. Dutch pupils have the best results in all of the topics.

In physics as in mathematics, the same three levels of competence are defined in the international study: an advanced level, a high level and an intermediate level. In addition, the Norwegian researchers have defined a low level, below 475 points.

Table 3.4: Average achievement score in physics for the countries that took part in TIMSS Advanced 2008 and the percentage of girls who have chosen advanced physics.

	Average achievement score	Percentage of age cohort	Age	Years of formal schooling	Percentage of girls
Netherlands	582	3.4	18.1	12	29
Slovenia	535	7.5	18.7	12	27
Norway	**534**	**6.8**	**18.8**	**12**	**29**
Russian Federation	521	2.6	17.1	10-11	45
TIMSS Adv. scaled average	**500**				
Sweden	497	11.0	18.8	12	35
Armenia	495	4.3	17.7	10	53
Iran, Islamic Rep. of	460	6.6	18.0	12	44
Lebanon	444	5.9	17.9	12	29
Italy	422	3.8	18.9	12	40

Source: Mullis et al. 2009

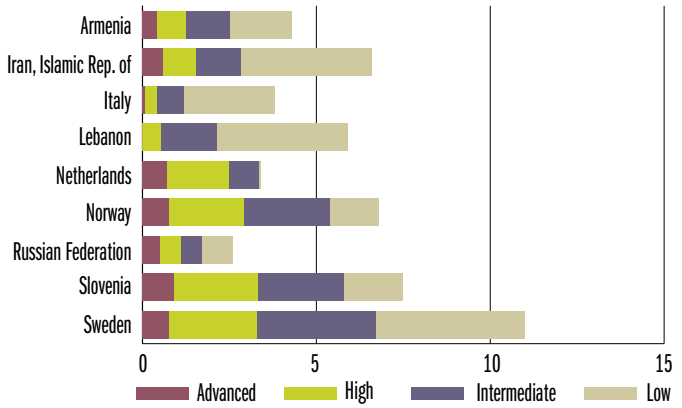
In figure 3.21, consideration has been given to the percentage of the year classes of pupils in the various countries who have chosen full in-depth study in physics, and the percentage distribution of the whole year class of pupils is shown here according to the competence achieved in the various levels of the subject. That means that the percentages will be low, but they still give some idea of the distribution of competence in physics among young people in each country on the whole. The length of each whole bar represents the percentage that are represented here in the selections. In this perspective, for example, the Netherlands is not particularly better than Sweden, Slovenia or Norway. However, we may conclude that, compared with the other participating countries, Norway appears to be among the best, regardless of the level of competence about which we are most concerned.

The relationship between the use of homework and the pupils' results in the TIMSS studies

There is much discussion about homework and its importance for the pupils' learning outcomes in the current school debate. Analyses from TIMSS 2007 and TIMSS Advanced 2008 show that the amount of time spent on homework is very significant, but the efficiency with which the individual utilises his/her time on homework and the way in which homework is followed up by the teacher are very important for the pupils' academic results (Rønning 2010, Grønmo et al. 2010).

In TIMSS Advanced 2008, there is no positive relationship between time spent on homework and the pupils' performance in mathematics and physics when this is measured for the individual pupil, but there is a clear, positive relationship between the amount of time a *school class* spends on homework and their results in mathematics and physics. There is also a clear, positive relationship between the frequency with which homework is reviewed in class and how well the class performs in both physics and mathematics (Lie et al. 2010, Grønmo et al. 2010). This may be interpreted to mean that homework used as a pedagogical tool by the teacher in cooperation with the pupils has a positive effect on the pupils' results. The TIMSS report for primary and lower secondary school concluded that Norwegian pupils were given the same amount of homework as pupils in other countries, but that compared with other countries it was rarely followed up by the teacher (Grønmo and Onstad 2009).

Figure 3.21: The distribution of pupils by competence level in physics in TIMSS Advanced 2008. Percentage of the whole age cohort.



Source: Lie et al. 2010

4 The learning environment

This chapter begins with a summary of some of the results of the analysis of *The Pupil Survey 2009*, with particular emphasis on the pupils' experiences with bullying in their schools. The objective is to give a picture of the pupils' learning environment in the Norwegian school system. Analyses of data from The Pupil Survey are still the most important basis for systematic knowledge about the learning environment. Among other things, the survey gives the pupils an opportunity to state their opinions about their own well-being and participation, about feedback in the academic effort and about the physical learning environment. The feedback from the pupils has been surveyed and analysed starting in the 2002-2003 school year. The data show that the results are stable from year to year at the national level, but that there are large local variations. The analysis of the survey in the spring of 2009 has also provided more knowledge about the relationships between the use of work plans and pupils' experiences as to whether the education and training is adapted to their needs.

Furthermore, some of the results are presented from the survey given by the Directorate for Education and Training every half year to school owners and school leaders regarding the ways in which the schools implement The Pupil Survey and the ways in which the survey is followed up at the school owner and school level.

An interim report from the evaluation of the Knowledge Promotion Reform shows, for example, that under certain conditions the learning environment may have some effect on the pupils' learning outcomes and some potential to reduce social disparities in these learning outcomes.

At the end of the chapter, the national effort, *Bedre læringsmiljø* (Better learning environment), is presented. This effort shall be evaluated starting in 2010, and the results will be published in future editions of the Education Mirror.

4.1 The Pupil Survey 2009

The Pupil Survey has been conducted in the primary and lower secondary school every spring since 2002. In 2009, more than 333,000 pupils from Year 5 up to and including Vg3 responded to the survey.

There are small variations in the results from one year to the next if we look at the survey for the country as a whole. If positive changes are to be made in the pupils' learning environment, it will require long-term cooperation on and prioritisation of the learning environment at several levels, among other things. The cooperation and the follow-up that occur at present have a considerable potential for improvement (Vibe and Evensen 2009).

On the other hand, the survey shows that there are substantial variations in the pupils' learning environment if we consider the long-term development in the various schools and if we consider the differences among schools (Skaar et al. 2008).

Figure 4.1 shows variations in the learning environment measured with indices in Years 7 and 10 and in Vg1. The indices are also presented in Skoleporten (the School Portal) (http://skoleporten.udir.no). The indices *codetermination* and *career guidance* are composed of questions that are only asked to pupils in Year 10 and in Vg1.

Each index is composed of several questions. An index's value is the average of the responses from all of the pupils to the relevant questions. The index is adapted to a scale from 1 to 5. Except for the indicator of bullying, a higher value indicates that more pupils are satisfied. For the indicator for bullying, the value of 1 indicates that no one has responded that they have been bullied. If the value is higher than 1, it means that some of the pupils have responded that they were bullied.

Variable
A variable is a question, or an assertion, about something that varies in the pupil group, e.g. *Do you do your homework?*

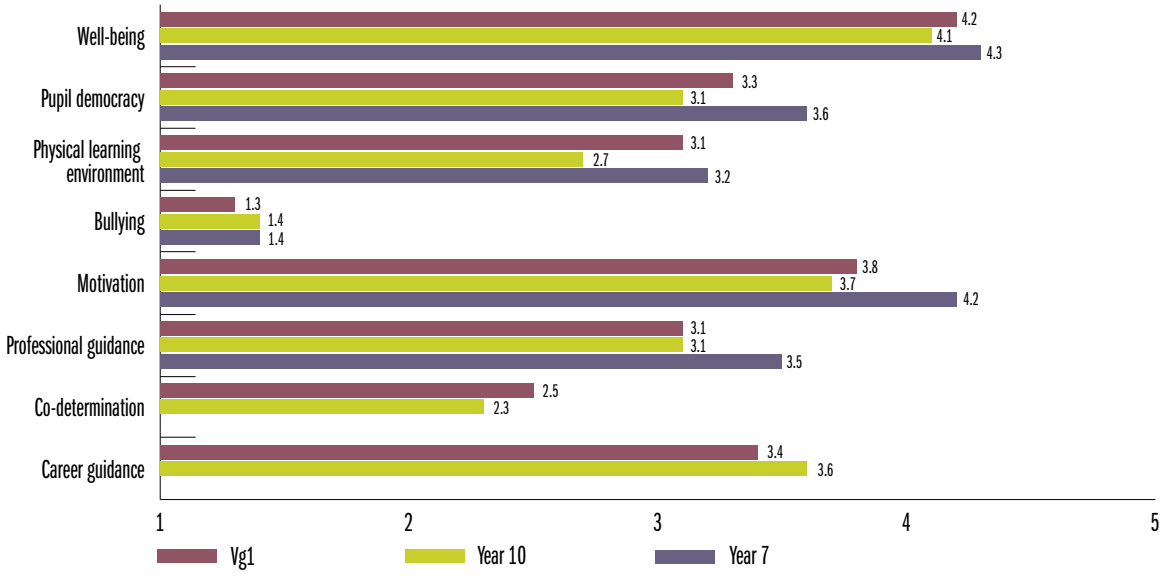
Index
An index is a complex quantity that consists of several variables (questions). For example, the motivation index in the Pupil Survey consists of four questions. One of them is: *Do you do your homework?*, and another is: *How well do you like the schoolwork?*

Indicator
Each individual variable (each question) in an index is called an indicator. That is why *bullying in the school* is described as an indicator in the School Portal rather than as an index. The reason is that *bullying in the school* is only measured by means of an individual question.

The general picture shows that the pupils enjoy school and that relatively little bullying occurs (figure 4.1). Well-being is the index that gives the best score for all three Years, whereas Year 7 also has a high score for motivation. The pupils in Year 10 and Vg1 feel that they have little codetermination. The index *codetermination* had a value that was below the middle of the scale.

Even though the indicator for bullying suggests that relatively little bullying occurs in school, there is still reason to take a closer look at this indicator. The figure presents data at the national level. That means that a small decimal segment on this scale represents many persons. We found that nearly 28,000 of the 330,000 pupils who responded to the survey said that they were bullied two to three times a month or more.

Figure 4.1: The learning environment of the pupils. Indices.



Source: Danielsen et al. 2009

Chapter 9a of the Education Act: The pupils' school environment

In Chapter 9a of the Education Act, it is specified that no pupil shall be subjected to offensive language or acts such as bullying and discrimination. All school employees have a duty to react if they learn or suspect that pupils are being subjected to such language or acts (duty to investigate and notify, Section 9a-3, paragraph 2). The school leadership has a duty to make plans to combat such offences and see that the school makes systematic, long-term efforts to improve the learning environment of the pupils.

In the report *Spørsmål til Skole-Norge høsten 2009 (Questions for the Norwegian School System in the autumn of 2009)* (Vibe and Evensen 2009), it was revealed that under half of the schools in the country have developed written routines for the ways in which they shall follow up the duty to investigate and notify. When it comes to the school owners, 38 per cent of the municipalities and 44 per cent of the counties do not have written routines for assessing whether the requirements in Chapter 9a have been met. About half of the school owners do not have written routines for handling deviations from Chapter 9a.

The publication *School-Based Programs to Reduce Bullying and Victimization* (Campbell Collaboration 2009), gives an overview of the programme to reduce bullying. This overview also discusses the individual measures that have been statistically effective against bullying. Along with the measure of getting the parents involved, cooperation among various professional groups has clearly been effective when it comes to reducing bullying. Serious conversations with the bullies, a meeting with the principal, visible teachers during free time and the loss of privileges also proved to be effective. This was especially true for younger children (Year 4). For somewhat older pupils (Year 6), it appears that non-punitive measures were most effective.

4.2 Use of work plans and adapted education

The national analysis of The Pupil Survey 2009 includes a separate analysis of the use of work plans and adapted education (Danielsen et al. 2009). This analysis is based on data from the whole lower secondary school, but the tendencies are the same for upper secondary school.

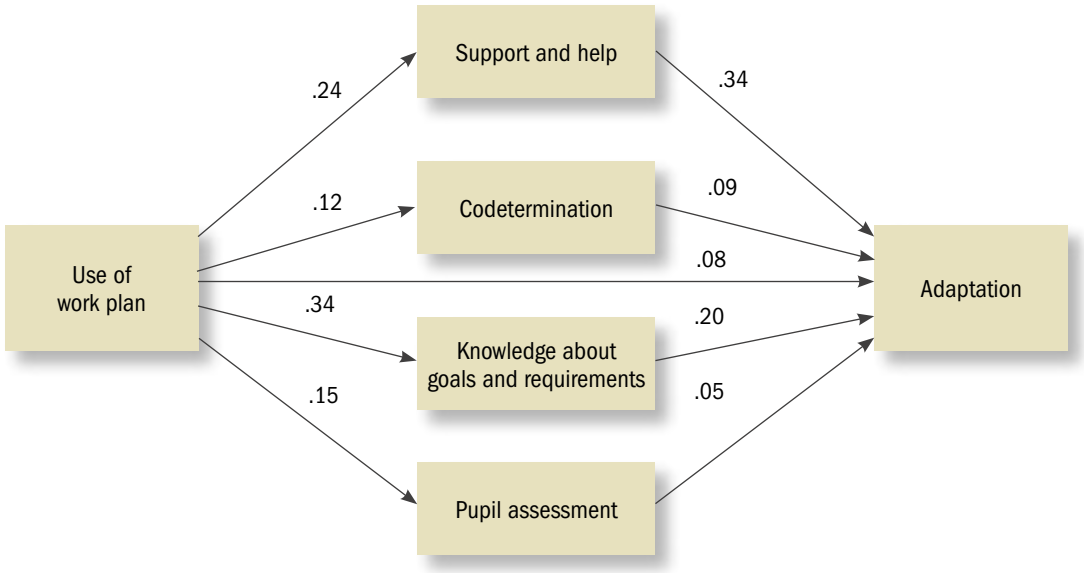
In lower secondary school, about 60 per cent of the pupils responded that they used work plans in many or most of the subjects. The analysis reveals a tendency that pupils who use written work plans find that the instruction is better adapted to their personal abilities. The analysis also reveals that there is an indirect connection between *the use of work plans* and *adaptation*, cf. figure 4.2.

Figure 4.2 illustrates that there is a connection between the experiencing of *support and help, codetermination, knowledge about goals and requirements* and *the frequency of pupil assessment* and *the use of work plans.* When the arrow has a high value, that indicates that there is a strong connection. We see that there is a strong connection between *the use of a work plan* by the pupils and *knowledge about goals and requirements* (.34).

In addition, the figure illustrates the connection between *support and help, codetermination, knowledge about goals and requirements* and *the frequency of pupil assessment* and *the use of work plans* and the experiencing of getting an *adapted* education. It appears that *support and help* has the strongest effect on the pupils' experience of getting an *adapted* education.

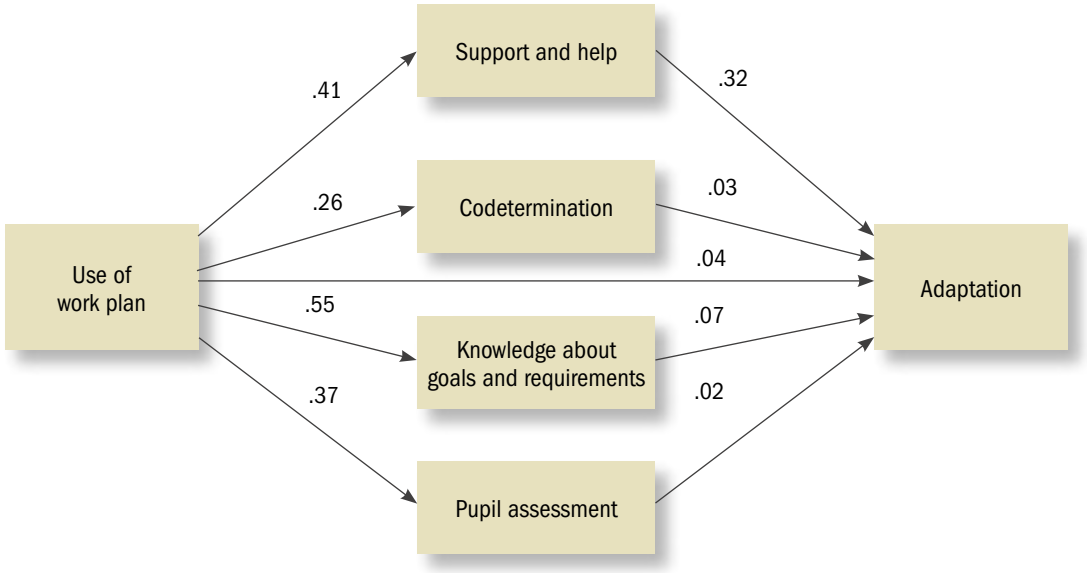
The direct connection between *the use of work plans* and the experience of getting an *adapted* education is weak (.08). If we interpret this as a cause and effect relationship (causal), it implies that the effect of *the use of work plans* on the experience of getting an *adapted* education will be conveyed through other variables, mainly through *a knowledge of goals and requirements* and through *support and help*.

Figure 4.2: Relationship between use of work plans and adaptation of the teaching. Lower secondary school.



Source: Danielsen et al. 2009

Figure 4.3: The relationship between the use of work plans and adaptation of the teaching for the eight per cent of the pupils who have the worst marks.



Source: Danielsen et al. 2009

The criticism of the use of work plans is mainly based on the argument that the pupils have different capabilities of self-regulation so that not all of the pupils have the same benefit from using work plans. Based on this criticism of the use of work plans, the theoretical model illustrated in figure 4.2 was tested on five groups of pupils who had different achievement levels (different average marks). The results show that the use of work plans has a positive effect on pupils at all achievement levels.

In the group of pupils who have the lowest achievement, they found the strongest connection between *the use of a work plan* and *the experiencing of getting help and support* (.41), the experiencing of *codetermination* (.26), *knowledge about goals and requirements* (.55) and the frequency of *assessment* of the pupils' work (.37), cf. figure 4.3. Other than that, the analysis shows that there are not any major differences among pupils at different achievement levels.

If we expand the model, we can look for more connections. Of particular interest is whether *the use of work plans* has any connection to the indices *relation to the teachers, motivation for schoolwork, effort and perseverance, and marks*. Other research shows that a positive relationship to the teachers has a significant impact on the pupils' motivation for schoolwork, the pupils' willingness to seek help with the schoolwork when they need it, their willingness to comply with the rules of the school and the pupils' academic results (Danielsen et al. 2009).

In order to elicit connections, the results are presented in the form of a path analysis, cf. figure 4.4. This analysis is based on national data from the lower secondary school in The Pupil Survey.

There is a strong positive connection between *the use of work plans* and the *relationship the pupils had to the teachers*. For the most part, this connection is indirect, conveyed by the experience the pupils have of getting *support and help*, of gaining *knowledge about learning goals and requirements* and of getting an *adapted education*, cf. figure 4.4. The path analysis only shows statistical relationships, and we have to be careful about interpreting the results causally, but the figure shows that the use of work plans results in a better relationship between the teacher and the pupil because the use increases the experience the pupils have of getting help and support from the teachers, of having knowledge about goals and requirements and that the instruction is better adapted to their own abilities.

The analysis also shows that there is a connection between *adaptation* of education and *the motivation* of the pupils. This connection is conveyed both directly and indirectly through the relationship to the teachers. Furthermore, we see that the use of work plans affects the pupils' motivation, but this connection is conveyed indirectly through the experience the pupils have of getting *support and help* on their schoolwork, of gaining *knowledge about goals and requirements*, of getting *adapted* education and of *their relationship to the teachers*.

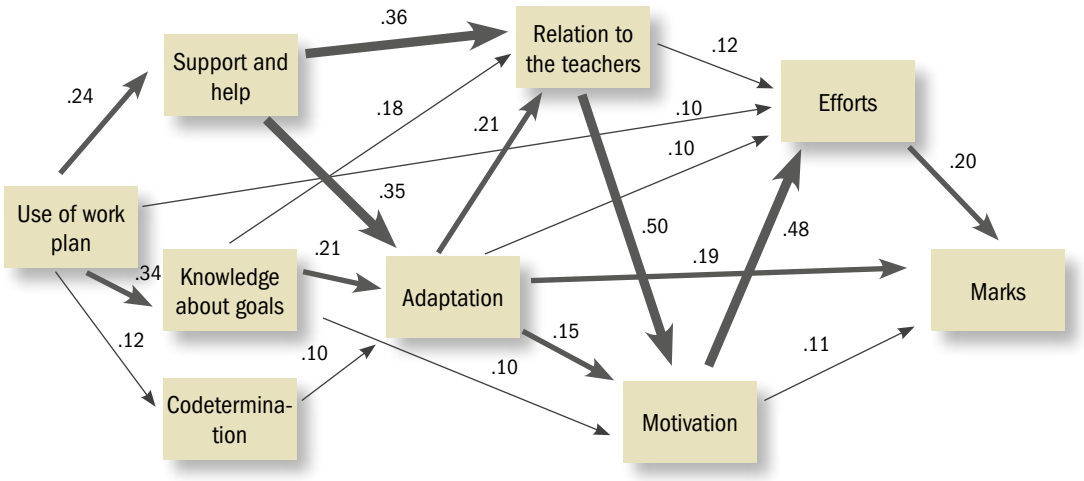
There is also a connection between *the efforts* of the pupils and the use of work plans. This connection manifests itself as both a direct connection and an indirect connection via other indices.

The indices that gave the best explanation of *the marks* were *the motivation* of the pupils (.11), whether the pupils experienced the education as *adapted to* their own abilities (.19), and also *their efforts* and perseverance (.20).

The model that is used can only explain the learning outcomes of the pupils to a relatively small extent when they are measured by means of marks. The reason for this is that the survey does not provide information about the pupils' capabilities for learning, their academic self-concept or the conditions in their homes.

Use of work plans has a positive affect on adaptation and on the relationship to the teachers. This positive effect comes through the effect that the use of work plans has on the knowledge of the goals

Figure 4.4: Direct and indirect relationships among various factors in the learning environment of the pupils.



Source: Danielsen et al. 2009

for the schoolwork and because the teacher gets a better opportunity to provide guidance to pupils who need it (support and help). This in turn has a positive effect on a number of factors; e.g. the motivation and efforts of the pupils.

The analysis shows that work plans can be used deliberately as a tool in order to

- give the pupils a greater degree of codetermination
- give the pupils knowledge about goals and requirements that are related to the schoolwork
- free up time to give the pupils guidance, support and help in the schoolwork
- adapt the work to the pupils' capabilities – i.e. by all means give the pupils challenges, but those challenges should be realistic and of such a nature that the pupils have the experience of mastering them if they make an effort.

We can also use written work plans to maintain good communication with guardians, to inform guardians about the kind of tasks that the pupils are expected to perform, and to organise feedback from parents (Skaalvik and Skaalvik 2009). At the same time, it should be emphasised that the use of written plans requires a certain amount of self-regulation and is a tool for teaching the pupils self-regulation.

Even if analyses show that pupils at all achievement levels benefit from using written plans, some individual pupils may lack the degree of self-regulation that is needed in order to benefit from this way of working. Therefore, the use of written plans in school ought to be combined with systematic training in regulating and assessing their own work (Danielsen et al. 2009).

4.3 Implementation and follow-up of The Pupil Survey

The Directorate has wanted to survey the ways in which the schools implement The Pupil Survey and the ways in which it is followed up at the school and school owner levels. Therefore, in the autumn of 2009, questions were added to The Pupil Survey in the semi-annual survey that the Directorate gives to school leaders and school owners (Vibe and Evensen 2009).

The survey shows that 89 per cent of the schools each year inform the pupils beforehand about the objectives of The Pupil Survey. At 55 per cent of the schools, the pupils are given yearly information about the questions, whereas 25 per cent of the schools do not provide this kind of information at all. Forty-eight per cent of the schools give yearly information about the plans that exist for making use of the results, whereas 21 per cent never give it.

At 61 per cent of the schools, the teachers discuss the results of The Pupil Survey with the pupils each year, whereas this is never done at nine per cent of the schools. At half of the schools, the pupils' council and the Parents' Working Committee (PWC) are involved each year in the follow-up of the results, whereas that never occurs in about 20 per cent of the schools. The results are consistently followed up better at the large schools than at the small ones.

About one-fourth of the principals discussed the results from The Pupil Survey each year in the performance assessment interviews with the teachers, whereas 29 per cent did not specify this as a relevant topic (table 4.1). The results of the survey are more systematically included as a topic in the performance assessment interviews of the upper secondary schools than in primary and lower secondary school, whereas the primary and lower secondary schools are the schools where this is least often an annual topic.

The school owners were asked a question with an additional formulation beside the question asked of the principals. In addition to The Pupil Survey, they were also asked about the learning environment in general. Table 4.2 shows that most school owners (85 per cent) included the pupils' learning environment as a topic in the annual discussions with the individual principals. The percentage of school owners who follow up the pupils' learning environment each year in discussions with their own principals is 80 per cent or higher for all of the school owners.

Table 4.1: ***Are the results from the Pupil Survey included in the performance assessment interview you have with your teachers?*** **By type of school. Per cent.**

	Year				
	Primary school	Primary and lower secondary school	Lower secondary school	Upper secondary school	All
Yes, every year	25	16	27	37	26
Some years	38	48	40	40	41
No	33	30	29	17	29
Do not know	4	0	0	0	5
Total	100	100	100	100	100
Number of schools	341	130	119	115	705

Source: Vibe and Evensen 2009

Table 4.2: ***Is the learning environment of the pupils included in the annual discussions with the individual head teacher?*** **By size of municipality. Per cent.**

	Municipalities: Population divided into three groups				
	Under 3000	3000 to 9999	10,000 and over	County	All
Yes, every year	84	80	93	88	85
Some years	5	15	4	13	9
No	8	3	0	0	3
Do not know	3	3	4	0	2
Total	100	100	100	100	100
Number of school owners	37	40	28	16	121

Source: Vibe and Evensen 2009

Forty-two per cent of the schools and the school owners respond that they use The Pupil Survey to a great extent to analyse and develop the learning environment in the schools, whereas a little over half use the survey to some extent. The counties and the upper secondary schools make more use of the survey than do the municipalities and the primary and lower secondary schools. There is a completely consistent connection between the use of the survey and the number of pupils and the population. The biggest schools clearly use the survey to a greater extent than the smallest ones, and the larger municipalities use the survey more than the smaller municipalities. Two out of three school owners require that the schools conduct the survey by a particular date each year.

Both principals and school owners generally appear to be satisfied with the information they get from the Directorate for Education and Training about the way in which The Pupil Survey ought to be conducted, and there are very small differences between the two groups and among various types of schools and school owners. The schools and school owners are not equally satisfied with the information about the ways in which the survey should be followed up. In the evaluation of the *Bedre læringsmiljø* (Better learning environment) effort (cf. Section 4.6), it should be clarified whether the effort is found to be relevant.

4.4 New learning environment indices in Skoleporten (the School Portal)

Skoleporten is a tool for assessment of quality in primary and secondary education and training. The objective of Skoleporten is to give schools, school owners, parents, pupils and other interested parties access to relevant and reliable key figures for primary and secondary education and training (www.udir.no/skoleporten).

Skoleporten was relaunched in 2007 and since then has presented the pupils' learning environment expressed through six indices for the pupils in Year 7 and eight indices for the pupils in Year 10 and Vg1. In all of these Years, the portal shows data for the pupils' well-being in the school, among other things. For Year 10 and Vg1, you can also see the indices *career guidance* and *codetermination* (cf. figure 4.1).

In Report 31 (2007–2008) to the Storting *Kvalitet i skolen (Quality in the School)*, goals for primary and secondary education and training are presented that are meant to have an effect on the education and training at the individual school and of the individual pupil. In order to assess how far the municipalities and the whole country have come in the work to achieve these goals, they shall be followed up by means of indicators and/or indices. One of the goals is that all pupils and apprentices shall be included and experience a sense of mastery. The Report to the Storting specified the following indicators for registering achievement of goals: *well-being, bullying, challenges in the school, adapted education* and *feedback in subjects*.

In The Pupil Survey, indicators and/or indices have already been developed for the well-being of the pupils, for bullying and for professional guidance. When the work on the survey is completed in the spring of 2010, the indices *mastering* and *academic challenge* will be entered into Skoleporten.

In the efforts to follow up the Report to the Storting, a number of other questions were also developed with the aim of being able to present as many results from The Pupil Survey as possible as advice in the form of indices. Starting in the spring of 2010, school leaders, school owners and national school authorities with access to the report portal for The Pupil Survey will be able to study most of the results of the study in the form of indices.

The further development of The Pupil Survey must otherwise be seen in the context of the *Bedre læringsmiljø* (Better learning environment) effort (cf. Section 4.6) and *National principal programme* (cf. chapter 6).

In connection with the national supervisory body in 2010 and 2011, the Directorate for Education and Training wants to help facilitate a raising of competence in the sector. The *Bedre læringsmiljø* effort, which includes guidance on the regulations and guidance in practical work on the learning environment, plays a central role in this context.

National supervisory body will look at the pupils' working environment in 2010 and 2011:

The psychosocial environment of the pupils is the theme for the national supervisory body in 2010 and 2011. The supervisory body shall primarily deal with the pupils' psychosocial environment pursuant to Chapter 9a of the Education Act: *The pupils' school environment*, but it will also deal with the rules in chapter 11: *School bodies for user participation*. Even though the supervision of Chapter 9a will primarily deal with the system responsibility of the school owner, the supervisory body may also issue orders in the event of a violation of other requirements in the Act when that violation directly affects the pupils' psychosocial environment.

4.5 The ways in which the learning environment affects the learning outcomes of the pupils

Among other things, the evaluation of Reform 97 showed that there were major systematic differences in learning outcomes when they were measured on the basis of the gender of the pupils, minority status and the parents' level of education. The report *Prestasjonsforskjeller i Kunnskapsløftets første år* (Disparities in Performance in the First Year of the Knowledge Promotion Reform) assesses whether the reform helps reduce the social disparities in learning outcomes and the ways in which the learning environment affects the pupils' learning outcomes. This analysis is based on the responses in The Pupil Survey of the pupils in Year 10 in the spring of 2008. The results were linked to the results of the same pupils in national tests in Year 7 in 2005 and their examination marks in the spring of 2008 (Bakken 2010).

The results from The Pupil Survey show that the learning environment varies much more within the individual school than among the schools. In other words, pupils in the same school may experience the school's learning environment quite differently.

Among other things, the researchers examined how much the learning environment varied among the schools and to what extent the learning environment had an impact on the learning outcomes of the pupils in lower secondary school. Among other things, they found that the learning outcomes are better for pupils in schools with a very good learning environment (the 2.5 per cent of the schools with the best outcomes). This was especially evident in that boys, pupils whose parents have little education and pupils from language minorities had relatively better learning outcomes in these schools. The disparities in the learning outcomes are most clear when we compare the outcomes of equivalent groups of pupils with the outcomes they would have achieved at schools with a very poor learning environment (the 2.5 per cent of the schools with the poorest outcomes).

The analysis also shows that boys, pupils whose parents have little education and pupils from language minorities get better learning outcomes as a group if they go to schools where the pupils are interested in learning and like schoolwork, where the pupils feel that the education is adapted to their level and where the pupils are especially interested in the basic subjects: Norwegian, English and mathematics. (Bakken 2010).

4.6 Better learning environment

Bedre læringsmiljø (Better learning environment) (2009-2014) is a five-year state effort to improve the pupils' learning environment. The comprehensive goal of this effort is that all pupils shall feel that they have a good, inclusive learning environment that promotes health, well-being and their learning. Sub-goals for the effort are that all municipalities, counties and school leaders shall have an adequate system that safeguards the rights of the pupils pursuant to Chapter 9a of the Education Act. All school leaders shall see that their schools conduct a systematic, continuous, knowledge-based effort to promote the pupils' health, well-being and learning. The schools shall have good practices with regard to developing and maintaining a good, inclusive learning environment.

In 2009, the Norwegian Directorate for Education and Training allocated project funds to local efforts to develop an inclusive learning environment. Forty school owners received support for projects in a total of 87 schools. This support is supposed to go to project management and the purchase of external guidance. In the spring of 2010, a research-based evaluation was initiated, which included an examination of whether the effort has brought about any improvements in the pupils' learning environment. Together with the summaries from the national supervisory body in the autumn of 2010 and the autumn of 2011, the results of this evaluation will form a good knowledge base for the ongoing efforts to improve the learning environment in Norwegian schools.

The national effort *Better learning environment*

The effort is based on the Education Act and the curriculum (LK06). Internet-based guidance and materials that schools and school owners can use in the efforts to ensure pupil's rights to a good physical and psychosocial learning environment will play a key role; cf. the following link: http://www.udir.no/Tema/Laringsmiljo/. Among other things, the effort includes guidance on the regulations, information and materials for use in the work.
The schools can make use of the materials for the effort to work systematically on improving the learning environment. The materials consist of brief research-based articles about key topics such as classroom management, relations, bullying and cooperation between home and school. In all of the articles, specific advice is given for use in the efforts the school is making to improve the learning environment. Resources such as reflection exercises, checklists, questionnaires, evaluation forms and lectures are also linked to the articles.

5 Recruitment, completion and competence achievement in upper secondary education and training

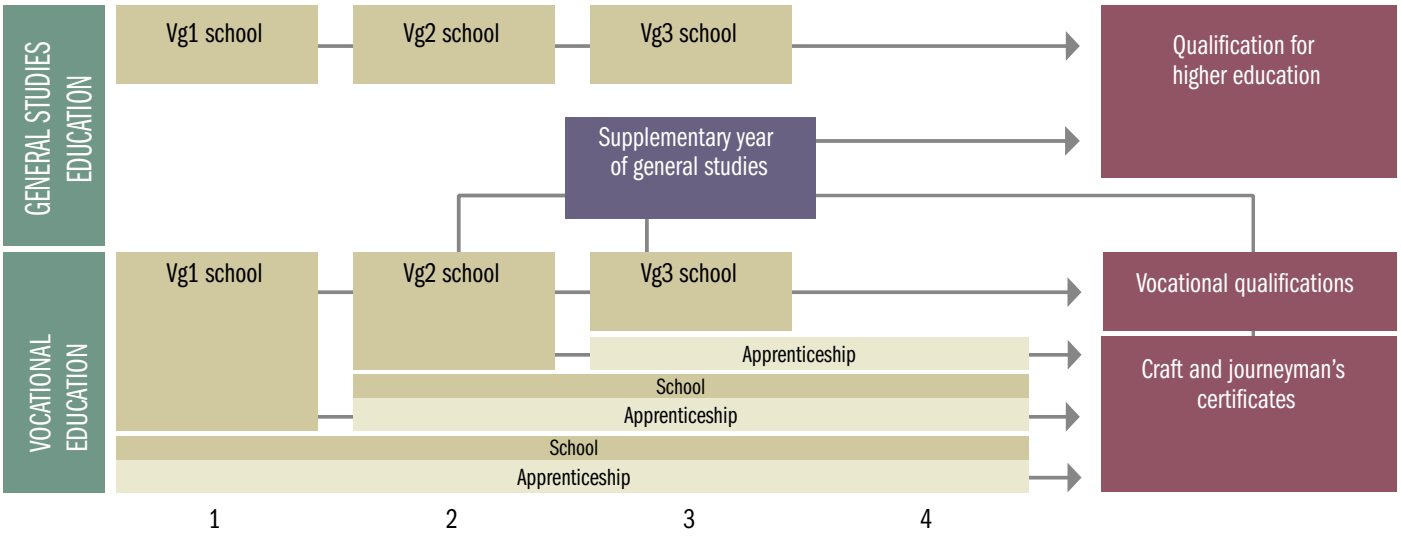
This chapter presents statistics of applicants, admissions, drop-out, completion and achieved competence for pupils, apprentices and training candidates in upper secondary education and training. The chapter is composed of many fragments and is therefore better suited as a reference work for the topics in which you are most interested than for reading in its entirety.

For upper secondary education and training in public schools, new statistics for applications for the 2010-2011 school year have been included. In addition, the preliminary figures for pupils and apprentices from the 2009-2010 school year have been included.

The statistics for completion, transitions between Years, drop-out, level of education and competence achievement still mainly include age cohorts from Reform 94, but some age cohorts from *the Knowledge Promotion Reform* are included in the statistics on transitions and drop-out.

Differences by immigrant background are commented upon in some cases. First generation immigrants are defined as persons who have immigrated to Norway at some time. Second generation immigrants are defined as persons who were born in Norway, but who have two immigrant parents. Where relevant, time series are included to illustrate developments over the past few years.

Figure 5.1: Education paths in upper secondary education and training under the Knowledge Promotion Reform.



Source: The Norwegian Directorate for Education and Training

5.1 Rights and the structure of upper secondary education and training

The county authorities are obligated to provide upper secondary education and training to everyone who comes under Sections 3-1 and 4a-3 of the Education Act. This includes everyone with the *youth right* and *adult right*. In addition, counties provide funding to all training establishments that sign apprenticeship contracts with an apprentice, including apprentices not entitled to upper secondary education and training. There are some persons who do not have the right to upper secondary education and training, but whom the county authorities still offer an education.

County authorities have a follow-up service (OT) for young people who have the youth right and who are not in upper secondary education and training or employed, cf. Section 3-6 of the Education Act and Section 13.1 of the associated regulations. The purpose of the follow-up service is to offer these young people education, training, work or some other occupation, the primary aim of which is to increase their competence. The follow-up service also cooperates closely with the counselling service in schools in order to reduce dropout rates from upper secondary education and training. In addition to educational counselling and career counselling, the counselling service also has social educational tasks.

Figure 5.1 shows the main paths to full competence at the upper secondary education and training level within the structure of the Knowledge Promotion Reform. There are two main paths up to the three competence reforms: the general studies and vocational courses of study. Competence for higher education qualifies the pupil for admission to universities and colleges, and it is mainly achieved in the three general studies education programmes *Specialisation in General Studies, Music, Dance and Drama and Sports and Physical Education*. Competence for higher education can also be achieved after Vg3 within general studies programme areas in *Agriculture, Fishing and Forestry* and *Media and Communication*. In addition, everyone who has completed and passed Vg1 and Vg2 in vocational education programmes in school can qualify for higher education by taking a supplementary year qualifying for higher education in Vg3.

After the Knowledge Promotion Reform, upper secondary education and training has nine vocational education programmes. These lead to craft certificates, journeyman's certificates or vocational qualifications. The main model for the vocational education programmes is two years in school and two years' training in a training establishment, followed by craft or journeyman's examinations. Some education programmes deviate from the main model. In *Electricity and Electronics,* there are other courses of study that consist of three years in school followed by one and a half years or two years in apprenticeship or two years in school followed by two and a half years in apprenticeship, whereas *Building and Construction, Design, Arts and Crafts* and *Technical and Industrial Production* have courses of study with one year in school followed by three years in apprenticeship. In the education programmes *Design, Arts and Crafts, Health and Social Care, Media and Communication, Electricity and Electronics* and *Agriculture, Fishing and Forestry,* vocational qualifications are given after Vg3 without apprenticeship in some programme areas.

In addition to the main paths, there are county-administered models in certain education programmes that provide both competence for higher education and a craft certificate in a four year course of study (the TAF model). There are also some persons who gain planned competence at a lower level as a course of study that does not award a diploma.

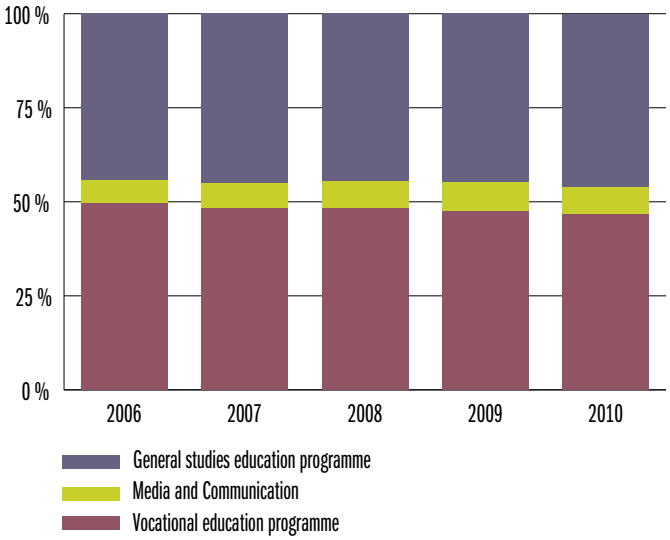
5.2 Applicants to upper secondary education and training in public schools

There are only minor changes in the patterns of application after the introduction of the Knowledge Promotion Reform (KL06). The observed changes are either of a limited nature or represent more prolonged trends that cannot be tied to the reform as such. (Frøseth et al. 2008).

The increasing percentage of applicants for the general studies programmes in Vg1, cf. figure 5.2, is one such trend. This increase applies to all three of the education programmes that lead to competence for higher education (Frøseth et al. 2008). In addition, there is some increase in the applications for the education programme *Media and Communication* (from 6.2 per cent in 2006 to 7.4 per cent in 2010), an education programme that is vocational, but where over 90 per cent of the pupils complete it with university and college admissions certification and thereby qualify for higher education. With the exception of this education programme, there is a clear decline in the percentage of applicants for vocational education programmes since the introduction of the Knowledge Promotion Reform. An increase in applications for *Specialisation in General Studies* is related to the establishment of Arts, Crafts and Design Studies, which replaces Arts and Crafts (Frøseth et al. 2008). Thus, the number of applicants for *Specialisation in General Studies* cannot be interpreted as increasing relative to the figures for the corresponding area of study before the reform.

Another prolonged trend is that the difference between boys and girls is increasing (Frøseth et al. 2008). This is due to the girls increasingly applying to the programmes that give university and college admissions certification while the boys' application pattern has remained more stable. There is also a significant gender gap in applications to the various education programmes. The boys dominate the applications to technical education programmes such as *Building and Construction, Electricity and Electronics* and *Technical and Industrial Production*. The girls dominate the *Design, Arts and Crafts, Health and Social Care* and *Music, Dance and Drama programmes*. There is also a small majority of girls in the largest education programme, *Specialisation in General Studies* (Frøseth et al. 2008).

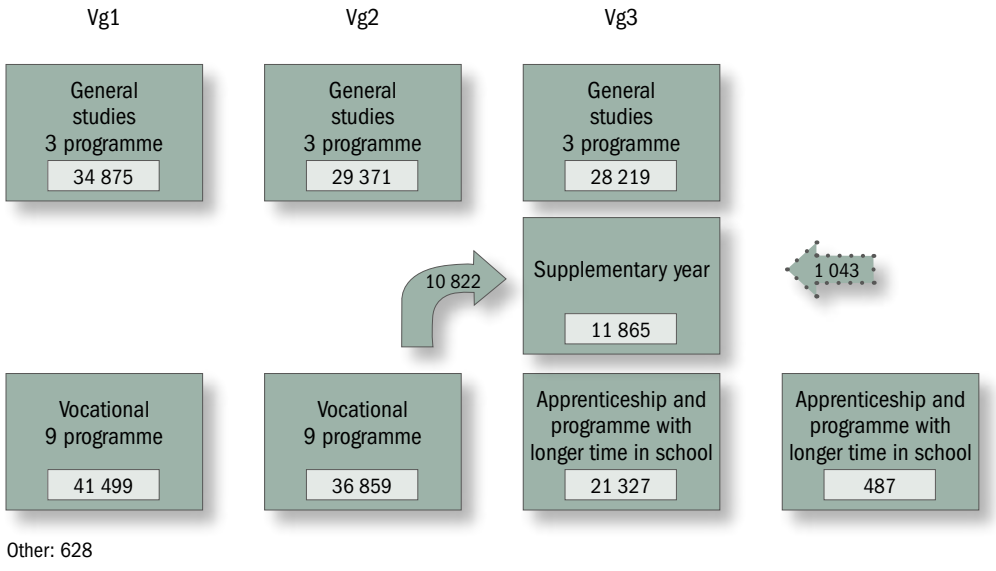
Figure 5.2: Applicants to general studies and vocational education programmes in Vg1. 2006-2010. Per cent.



Sources: The Norwegian Directorate for Education and Training, VIGO 2010

Figure 5.3 gives an overview of the applications to the various Years and courses of study in upper secondary education and training. The applications to the first two Years were greatest in the vocational education programmes. For Vg3, however, the situation is the opposite when we count the supplementary year qualifying for higher education together with the general studies programmes. There were twice as many applicants to general studies and to the supplemen-

Figure 5.3: Applicants to upper secondary education and training as per 1 March 2010, by Year and education path.



Source: Norwegian Directorate for Education and Training 2010

Table 5.1: Applicants to Vg1 (upper secondary level 1) as per 1 March 2010 by education programme. Number and per cent.

	Number	Percentage	Change from 2009 in percentage points
All programmes	74 846	100	
Specialisation in General Studies	25 827	34.5	1.7
Music, Dance and Drama	3 424	4.6	0.4
Sports and Physical Education	4 839	6.5	0.0
Health and Social Care	8 262	11.0	0.6
Agriculture, Fishing and Forestry	1 584	2.1	0.1
Design, Arts and Crafts	3 163	4.2	-0.4
Restaurant and Food Processing	2 187	2.9	-0.2
Building and Construction	4 182	5.6	0.0
Electricity and Electronics	5 589	7.5	0.1
Technical and Industrial Production	6 738	9.0	-0.1
Media and Communication	5 489	7.3	0.1
Service and Transport	2 850	3.8	0.1
Technical General Studies (TAF)	622	0.8	0.0
Alternative education and training	90	0.1	-2.4

Sources: The Norwegian Directorate for Education and Training/VIGO 2010

tary year qualifying for higher education as for applicants to apprenticeships and vocational programme areas in schools. There are also a little over 1,000 pupils who applied for a supplementary year after having passed their vocational qualifications.

The application figures presented in figure 5.3 and tables 5.1 to 5.5 are collected on 1 March each year when the application deadline for admission to upper secondary school expires. Up to the first admission in July, however, applicants may change their primary choice, and some applicants are not qualified for admission. Some new applicants also apply after the closing date for applications. Applicants to private upper secondary schools are not included in the tables, but some applicants to private schools are included in figure 5.3. The tables and the figure in this sub-chapter only include applications to courses offered within the structure of the Knowledge Promotion Reform.

Applicants to Vg1 (upper secondary level 1)

Most pupils graduating from lower secondary school apply for admission to upper secondary education and training, in 2007 as many as 99.6 per cent (Frøseth et al. 2008). In addition, there are applicants who have already been in upper secondary education and training the year before they apply to upper secondary level 1.

Table 5.1 shows that there was a total of 74,846 applicants to upper secondary level 1 in the spring of 2010, and this was about 1,300 more than the number of applicants in 2009. This increase occurred even though there were 300 fewer 16-year-olds on 1 January 2010 than there were on the same date in 2009 (Statistics Norway 2010b).

Forty-six per cent of the applicants have applied for one of the three education programmes giving university and college admissions certification, whereas 54 per cent applied for vocational education programmes (excluding alternative education and training and courses that give both vocational qualifications and university and college admissions certification).

After a declining trend up to 2008, the percentage of applicants to *Health and Social Care* has now increased for the second year in a row and is now at 11 per cent (compared to 10.4 per cent last year). The percentage of applicants to *Building and Construction* is at the same level as last year so that last year's decline of 1.7 percentage points appears to have come to a halt. The increase in the percentage of *Specialisation in General Studies* is probably related to the decline in the applications for alternative education and training. There are only minor changes from last year for the other programmes.

By comparing the number of pupils for the 2009-2010 school year with application figures as of 1 March 2010, it is possible to see which education programmes are over or undersubscribed relative to the number of available study places. That a programme is oversubscribed means that there are more applicants to the programme than the number of study places that are offered to the pupils in the 2009-2010 school year. If it is undersubscribed, that means that there are fewer applicants than available places.

Both in absolute numbers and relative to the number of pupils, the most oversubscribed education programme is *Media and Communication* (1 884 applicants, 50 per cent). There were 1,884 more applicants to Media and Communication than there were pupils in the current school year, which amounts to 52 per cent of the number of pupils in this school year. The programmes *Music, Dance and Drama* (1,063 applicants, 45 per cent) and *Sports and Physical Education* (883 applicants, 22 per cent) were also considerably oversubscribed.

In absolute and relative numbers, the most undersubscribed programme is *Building and Construction* (760 applicants, 15.4 per cent). In absolute numbers, *Specialisation in General Studies* is also considerably undersubscribed (577), but that comes to only two per cent of the number of study places. In relative numbers, *Restaurant and Food Processing* (335, 13 per cent) and *Service and Transport* (345, 11 per cent) are also somewhat undersubscribed.

Applicants to Vg2 (upper secondary level 2)

Table 5.2 shows that there was a total of 64,922 applicants to Vg2 in the spring of 2010, which was fewer applicants than in 2009.

A majority of the applicants, 55.4 per cent, applied for vocational education programmes (applications to alternative education and training and programmes that give qualification for both vocational and higher education are not included in this calculation).

There was a decline of 0.7 percentage points in applications to *Building and Construction*, which is related to last year's decline in Vg1. Likewise, applications to *Health and Social Care* increased on the basis of last year's increase in Vg1. This is in keeping with an analysis that NIFU STEP (the Norwegian Institute for Studies in

Table 5.2: Applicants to Vg2 (upper secondary level 2) as per 1 March 2010 by education programme. Number and per cent.

	Number	Percentage	Change from 2009 in percentage points
All programmes	64 922	100	
Specialisation in General Studies	23 044	35.5	0.7
Sports and Physical Education	3 719	5.7	0.3
Music, Dance and Drama	2 092	3.2	0.3
Building and Construction	4 248	6.5	-0.9
Design, Arts and Crafts	2 591	4.0	0.2
Electricity and Electronics	4 342	6.7	0.3
Health and Social Care	7 809	12.0	0.8
Media and Communication	3 061	4.7	-0.3
Agriculture, Fishing and Forestry	1 228	1.9	-0.1
Restaurant and Food Processing	2 065	3.2	-0.1
Service and Transport	4 288	6.6	-0.4
Technical and Industrial Production	6 213	9.6	0.2
Technical General Studies (TAF)	220	0.3	0.0
Alternative education and training	2	0.0	-1.1

Sources: The Norwegian Directorate for Education and Training/VIGO 2010

Table 5.3: Applicants to Vg3 (upper secondary level 3) as per 1 March 2010 by education programme. Number and per cent.

	Number	Percentage	Change from 2009 in percentage points
All programmes	44 325	100	
Specialisation in General Studies	22 464	50.7	0.4
Sports and Physical Education	3 495	7.9	0.0
Music, Dance and Drama	1 856	4.2	0.1
Supplementary year qualifying for higher education	11 502	26.0	2.2
Design, Arts and Crafts	285	0.6	-0.1
Electricity and Electronics	1 025	2.3	0.1
Health and Social Care	830	1.9	-0.1
Media and Communication	2 211	5.0	0.3
Agriculture, Fishing and Forestry	509	1.1	-0.3
Technical General Studies (TAF)	131	0.3	-0.4
Alternative education and training	13	0.0	-1.9

Sources: The Norwegian Directorate for Education and Training/VIGO 2010

Innovation, Research and Education) conducted, which shows that the changes in the number of applicants in Vg2 reflect changes in the number of pupils in Vg1 the previous year (Frøseth et al. 2008).

Applicants to Vg3 (upper secondary level 3) in school

Starting in the 2008–2009 school year, the Knowledge Promotion Reform was implemented in the third Year of upper secondary education and training. Application figures for Vg3 in school are kept separate from applicants to apprenticeship. In the education programmes *Building and Construction, Restaurant and Food Processing, Service and Transport,* and *Technical and Industrial Production,* Vg3 is not offered in school.

Table 5.3 shows that there were 44,325 applicants to Vg3 in the spring of 2010, just under 2,000 fewer than in 2009. A total of 89 per cent applied to programmes for general studies or the supplementary year that qualifies for higher education (excluding alternative education and training and courses that give both vocational qualifications and university and college admissions certification).

In the vocational programmes, most pupils become apprentices after Vg2. Thus, as the table shows, there are very few applicants for vocational education in school. In some subjects in *Health and Social Care, Media and Communication, Electricity and Electronics* and *Agriculture, Fishing and Forestry,* however, vocational qualifications are achieved after Vg3 without apprenticeship. Slightly less than 94 per cent of the applicants to *Media and Communication* apply to the general studies programme area and only 2.1 per cent apply to *Media Design,* which gives vocational qualifications. Likewise, 42 per cent of those who apply for *Agriculture, Fishing and Forestry* apply to the general studies programme area. Due to an insufficient number of apprenticeships, more pupils take the training part of their apprenticeship in school later than indicated by the application figures.

The biggest change in applications to Vg3 was in the supplementary year qualifying for higher education, which increased by two percentage points to 26 per cent. There were only minor changes for the other programmes. Analyses from NIFU STEP confirm the trend where many who begin with vocational studies switch to the supplementary year in general subjects. About 15 per cent of the pupils who started vocational studies in 2004 are taking the supplementary year in general subjects in the autumn of the third Year (Frøseth et al. 2008). It looks as if this percentage has increased in recent years.

After Vg1 and Vg2, pupils in vocational education programmes can take the Vg3 supplementary year qualifying for higher education. This applies to pupils in all vocational education programmes. In 2010, nearly 11,000 pupils applied for this alternative. In addition, some of those pupils apply for the supplementary year qualifying for higher education after they have completed their apprenticeship. About 1,000 applicants in nine counties applied for this alternative.

Out of all the applicants for the supplementary year qualifying for higher education, a little less than 8,000 pupils were in Vg2 vocational programmes in the current school year, cf. table 5.4. This means that 22 per cent of all of the pupils in Vg2 apply for the supplementary year.

The greatest number of applicants were from *Health and Social Care*, where 2,577 applied for the supplementary year, which amounted to 33 per cent of all those who attended Vg2 *Health and Social Care* in the 2009-2010 school year. In addition, many of the applicants were

Table 5.4: Pupils in vocational Vg2 who apply for a supplementary year qualifying for higher education, by education programme. Number and per cent.

Applicant to the programme was registered in October 2009	Number of pupils in Vg2	Number who have applied for a supplementary year	Percentage who have applied for a supplementary year
Total	35 180	7816	22.2
Service and Transport	3 902	1439	36.9
Health and Social Care	7 789	2577	33.1
Design, Arts and Crafts	2 262	662	29.3
Media and Communication	3 160	601	19.0
Restaurant and Food Processing	2 059	370	18.0
Electricity and Electronics	4 042	646	16.0
Building and Construction	4 790	762	15.9
Agriculture, Fishing and Forestry	1 469	231	15.7
Technical and Industrial Production	5 707	526	9.2

Sources: The Norwegian Directorate for Education and Training/VIGO 2010

Table 5.5: Applicants for apprenticeship as per 1 March 2010 by education programme. Number and per cent.

	Number	Percentage	Change from 2009 in percentage points
Total	16 609	100	
Building and Construction	3 008	18.1	-1.8
Design, Arts and Crafts	844	5.1	-0.6
Electricity and Electronics	2 621	15.8	1.7
Health and Social Care	2 666	16.1	0.5
Media and Communication	93	0.6	-0.1
Agriculture, Fishing and Forestry	375	2.3	-0.1
Restaurant and Food Processing	1 174	7.1	-0.7
Service and Transport	1 737	10.5	-0.8
Technical and Industrial Production	3 954	23.8	1.2
Technical General Studies (TAF)	137	0.8	.

Sources: The Norwegian Directorate for Education and Training/VIGO 2010

from *Service and Transport* (37 per cent) and *Design, Arts and Crafts* (29 per cent).

Most of the applicants were age 20 or younger, and over 6,000 were 18 years old when they applied. This indicates that most of the applicants for the supplementary year go directly from Vg2 to the supplementary year without a pause.

The percentage of applicants for the supplementary year alternative varies from county to county. Whereas one fourth of the applicants to Vg3 in Troms and Finnmark counties applied for a supplementary year, the percentage in Oslo was under 10 per cent.

Applicants to apprenticeship

There are 16,609 applicants to apprenticeship in the 2010–2011 school year, i.e. more than the previous year, cf. table 5.5. Apprentices who have arranged for their own apprenticeship contracts with training establishments without applying are not included. However, they are included as applicants when their apprenticeship contract is approved by their county.

The largest education programmes, *Technical and Industrial Production, Building and Construction, Health and Social Care* and *Electricity and Electronics*, also have the largest number of applicants for apprenticeships, whereas *Media and Communication, Agriculture, Fishing and Forestry* and *Design, Arts and Crafts* have the fewest applicants. For the *Media and Communication* and *Agriculture, Fishing and Forestry* programmes this is probably related to the large number of pupils who achieve vocational qualifications at Vg3 without apprenticeship or who take the general studies course of study. *Design, Arts and Crafts* is a small education programme and only offers vocational qualifications in Vg3 without apprenticeship to a limited extent, but a relatively large percentage of pupils, 29 per cent, apply for the supplementary year qualifying for higher education, see table 5.4.

The decline in the percentage of applicants for apprenticeship in *Building and Construction* continued from last year, and is now down to 18 per cent (compared with about 22 per cent in 2008 and about 20 per cent in 2009). There was also a decline in *Service and Transport, Restaurant and Food Processing* and *Design, Arts and Crafts*. The percentage who applied for apprenticeship in *Electricity and Electronics,* continued to increase and is now slightly less than 16 per cent (compared with 11 per cent in 2008 and 14 per cent in 2009). There was also an increase in *Technical and Industrial Production*.

5.3 Pupils, apprentices and training candidates in upper secondary education and training

Figures for pupils and apprentices are collected as of 1 October. By this date, admissions and the procurement of apprenticeship contracts are largely completed, although contracts are also procured after this date. Some of the pupils who do not get an apprenticeship, take the training part of their apprenticeship in Vg3 in school. Most of these programmes begin after 1 October, so they are not included in these statistics.

The Knowledge Promotion Reform has been implemented at all levels, but there are still some pupils being educated according to the old structure in R94. The main reason for this is that dispensations have been given for some county-administered areas of study. The number of pupils in the tables are non-revised figures from KOSTRA (Municipality-State Reporting) and only include pupils following the Knowledge Promotion Reform structure. The tables with apprentices and training candidates are also non-revised figures from KOSTRA, but both structures (R94 and KL06) are included here because there

Table 5.6: Pupils in Vg1 (upper secondary level 1) as per 1 October 2009, by education programme. Number, percentage and percentage with the youth right. Non-revised figures.

	Number	Percentage	Percentage with the youth right
Total number of pupils	73 423	100	94.0
Sports and Physical Education	3 956	5.4	97.4
Music, Dance and Drama	2 361	3.2	95.2
Specialisation in General Studies	26 404	36.0	92.6
Building and Construction	4 942	6.7	95.5
Design, Arts and Crafts	3 331	4.5	96.0
Electricity and Electronics	4 804	6.5	96.9
Health and Social Care	8 039	10.9	92.5
Media and Communication	3 605	4.9	92.5
Agriculture, Fishing and Forestry	1 687	2.3	88.1
Restaurant and Food Processing	2 522	3.4	95.4
Service and Transport	3 195	4.4	94.1
Technical and Industrial Production	6 767	9.2	96.3
Alternative education and training	1 810	2.5	95.7

Sources: The Norwegian Directorate for Education and Training/VIGO 2010

Table 5.7: Pupils in Vg2 (upper secondary level 2) as per 1 October 2009, by education programme. Number, percentage and percentage with the youth right. Non-revised figures.

	Number	Percentage	Percentage with the youth right
Total number of pupils	65 957	100	93.9
Sports and Physical Education	3 542	5.4	98.7
Music, Dance and Drama	1 975	3.0	98.5
Specialisation in General Studies	24 581	37.3	97.2
Building and Construction	4 790	7.3	95.3
Design, Arts and Crafts	2 262	3.4	91.6
Electricity and Electronics	4 042	6.1	95.2
Health and Social Care	7 789	11.8	78.2
Media and Communication	3 160	4.8	98.6
Agriculture, Fishing and Forestry	1 469	2.2	88.0
Restaurant and Food Processing	2 059	3.1	91.3
Service and Transport	3 902	5.9	93.6
Technical and Industrial Production	5 707	8.7	94.8
Alternative education and training	679	1.0	98.7

Sources: The Norwegian Directorate for Education and Training/VIGO 2010

a considerably more apprentices than pupils who are in educational pathways in the former structure.

Pupils in Vg1 (upper secondary level 1)

73,423 pupils were registered in Vg1 in the autumn of 2009, which was fewer than in 2008, cf. table 5.6. 280 of these pupils are attending a programme that gives both vocational qualifications and competence for higher education (TAF). The most pupils are enrolled in *Specialisation in General Studies* (26,404 pupils), and almost 46 per cent are enrolled in general studies education programmes (pupils in alternative education and training are not included in the calculation). Among the vocational education programmes, the most pupils were in *Health and Social Care* and *Technical and Industrial Production*. The fewest number of pupils were in *Music, Dance and Drama*.

Out of all of the pupils in Vg1, 94 per cent had the youth right in the autumn of 2009. The percentage who had the youth right was lowest in *Agriculture, Fishing and Forestry, Media and Communication* and *Health and Social Care*.

Pupils in Vg2 (upper secondary level 2)

In the 2009-2010 school year, 65,957 pupils were registered in Vg2, cf. table 5.7. 241 of these pupils are attending a programme that gives both vocational qualifications and competence for higher education (TAF). As in Vg1, the most pupils are enrolled in *Specialisation in General Studies*, and 46.1 per cent are enrolled in general studies education programmes (pupils in alternative education and training are not included in the calculation). In 2009-2010, the lowest number of pupils are enrolled in the education programmes *Agriculture, Fishing and Forestry, Music, Dance and Drama and Restaurant and Food Processing*.

Out of all of the pupils in Vg2, 93.9 per cent had the youth right in the autumn of 2009. The percentage who had the youth right was lowest in *Agriculture, Fishing and Forestry and Health and Social Care*.

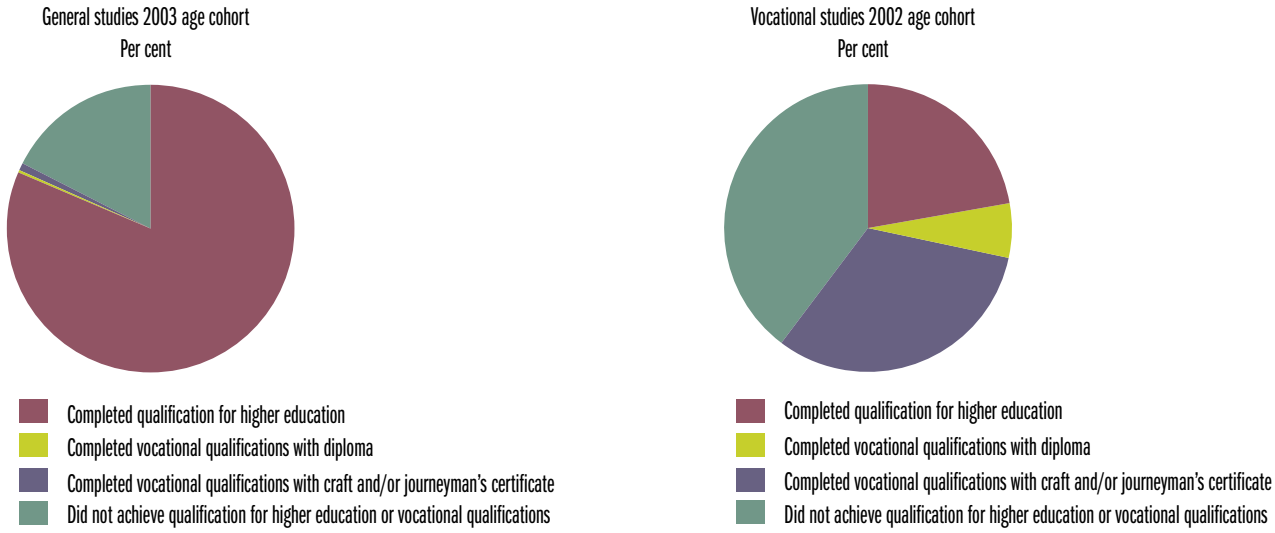
Pupils in Vg3 (upper secondary level 3) in school

There were 50,933 pupils in Vg3 in the autumn of 2009, cf. table 5.8. 348 of these pupils are attending a programme that gives both vocational qualifications and competence for higher education (TAF). The number of pupils in Vg3 is higher than the number of applicants on 1 March 2009 because the number of pupils includes the number of young people who have started upper secondary education and training without having applied in the spring. The reason for this may be that they originally applied for admission to a private school, but started public school instead. There are also some pupils who have applied for admission after the deadline and pupils who applied for apprenticeships but did not receive one and ended up in school instead.

After Vg2, many pupils who take vocational programmes, transfer to training in training establishments, so most of the pupils in Vg3 in school take general studies programmes. This also applies to the vocational education programmes *Media and Communication* and *Agriculture, Fishing and Forestry,* in which 98 and 50 per cent respectively of the pupils in Vg3 are enrolled in the general studies programme area.

There are many pupils who take vocational qualifications in school in *Health and Social Care* and *Agriculture, Fishing and Forestry*. Most of the pupils who take *Electricity and Electronics* in Vg3 are in a course of study that includes three years in school and one and a half to two years in apprenticeship afterward.

Figure 5.4: Achieved competence at the Vg3 level five and six years after pupils began school in general studies and vocational areas of study respectively for the age cohorts 2003 and 2002 (R94). Per cent.



Source: Statistics Norway 2010

Some of the pupils who do not get an apprenticeship after Vg2 take the training part of their apprenticeship in school. All of the pupils who are registered in Vg3 in the education programmes *Restaurant and Food Processing, Service and Transport*, *Building and Construction* and *Technical and Industrial Production* either take the training part of the apprenticeship in school instead of in a training establishment or are registered in courses of study that give both vocational qualifications and competence for higher education (the TAF model).

Table 5.8: Pupils in Vg3 (upper secondary level 3) as per 1 October 2009, by education programme. Number, percentage and percentage with the youth right. Non-revised figures.

	Number	Percentage	Percentage with the youth right
Total number of pupils	50 933	100.0	82.9
Sports and Physical Education	3 789	7.4	94.5
Music, Dance and Drama	1 962	3.9	97.1
Supplementary year qualifying for higher education	11 674	22.9	67.3
Specialisation in General Studies	26 394	51.8	90.6
Design, Arts and Crafts	364	0.7	73.6
Electricity and Electronics	1 040	2.0	85.2
Health and Social Care	966	1.9	64.3
Media and Communication	2 173	4.3	97.1
Agriculture, Fishing and Forestry	913	1.8	65.1
Building and Construction	191	0.4	60.2
Restaurant and Food Processing	35	0.1	60.0
Service and Transport	203	0.4	37.4
Technical and Industrial Production	370	0.7	73.0
Alternative education and training	859	1.7	95.7

Sources: The Norwegian Directorate for Education and Training/VIGO 2010

For *Design, Arts and Crafts,* 102 out of 364 persons in Vg3 take the training part of apprenticeship in school, and the equivalent numbers for the other education programmes are: 102 for *Electricity and Electronics*, 122 for *Health and Social Care*, 17 for *Agriculture, Fishing and Forestry*, and none in *Media and Communication*.

Many pupils who begin in vocational studies apply for a supplementary year qualifying for higher education after the second Year of upper secondary education and training, and there has been a big increase in these applications over a period of time. In the 2009-2010 school year, 11,674 pupils took a supplementary year qualifying for higher education, which comes to about 23 per cent of all the pupils and 18.6 per cent of the pupils with the youth right. Among the pupils who began in vocational studies in the 1994 cohort, 5.6 per cent applied to transfer to the supplementary year. For the 1999 cohort, the equivalent percentage had increased to ten per cent, and for the 2001 cohort it was 12 per cent (Helland and Støren 2004). The figures that Helland and Støren operate with are not directly comparable with the figures in the applicant statistics, but it looks as if the increase has continued after 2001.

Figure 5.4 illustrates how the transition from vocational studies to general studies affects the type of competence that the pupils who complete and pass Vg3 achieve.

Within five years, over 80 per cent of the pupils who begin the basic course in the general studies cohort achieve competence for higher education. Only one per cent of these pupils switch over to vocational qualifications in one of these two forms. Less than 18 per cent have not achieved any competence within five years.

The achievement of competence among the pupils who begin a basic course in vocational studies is somewhat different. A total of 38 per cent of those who begin in vocational studies, achieve vocational qualifications after six years. 32 per cent achieve a craft certificate or a journeyman's certificate, whereas six per cent achieve vocational

Table 5.9: Number of running and new apprenticeship and training contracts as per 1 October 2009, by education programme. Number. Non-revised figures.

	Running apprenticeship contracts	New apprenticeship contracts	Running training contracts	New training contracts
Total	34 419	14 173	1 081	496
The total Knowledge Promotion Reform	26 329	13 553	821	468
Building and Construction	5 587	2 569	167	89
Design, Arts and Crafts	1 739	1 072	33	23
Electricity and Electronics	3 935	2 057	9	4
Health and Social Care	4 078	2 185	177	104
Media and Communication	162	82	6	4
Agriculture, Fishing and Forestry	580	304	43	21
Restaurant and Food Processing	1 833	966	96	49
Service and Transport	2 375	1 306	121	76
Technical and Industrial Production	6 040	3 012	169	98
Total Reform 94	8 090	620	260	**28**
General, Business and Administration Studies	107	22	2	-
Health and Social Care	1 128	44	54	4
Agriculture, Fishing and Forestry	2 955	127	10	-
Arts, Crafts and Design Studies	707	128	10	1
Hotel and Catering	257	27	22	2
Construction and Building	499	47	57	13
Technical Construction and Building	38	3	-	-
Electricity and Electronics	1 101	131	53	4
Mechanical Subjects	88	7	2	-
Chemistry and Processing	132	10	12	-
Woodworking	276	34	17	1
Media and Communication	675	25	15	2
Sales and Service	127	15	6	1

Source: Norwegian Directorate for Education and Training 2010

qualifications with a diploma. Fully 22 per cent of the pupils who began a vocational basic course achieved competence for higher education. Finally, there are twice as many pupils who do not achieve any competence as was the case for pupils in general studies areas of study.

In 2009-2010, 82.9 per cent of the pupils had the youth right. The percentage with the youth right varies considerably among the education programmes, and it is lowest among the pupils in *Service and Transport, Agriculture, Fishing and Forestry* and *Health and Social Care*.

Training in training establishments – apprentices and training candidates

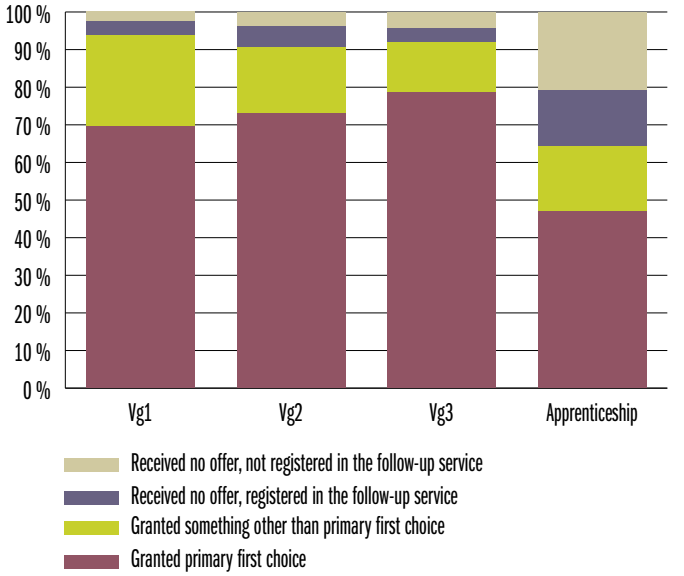
As per 1 October 2009, there was a total of 34,419 apprentices, and 31.4 per cent of all pupils in vocational education programmes in Vg2 in 2008–2009 were apprentices in 2009–2010 (KOSTRA 2009).

Table 5.9 shows running apprenticeship contracts and training contracts as of 1 October 2009 and new apprenticeship and training contracts from 1 October 2008 to 1 October 2009, by education programme. The implementation of the Knowledge Promotion Reform entailed a new structure for recognised trades. This resulted in a break in the series, so this year's figures are not easily comparable to previous years. The new recognised trades from the Knowledge Promotion Reform were implemented in the autumn of 2008, and four per cent of the new apprenticeship contracts were therefore entered into under the R94 structure.

For recognised trades under the Knowledge Promotion Reform, the highest number of new apprenticeship contracts are in *Technical and Industrial Production, Building and Construction* and *Health and Social Care*. The fewest new apprentices are in *Media and Communication* and *Agriculture, Fishing and Forestry*, which is in accordance with the fact that many pupils in these subjects take Vg3 in school.

In addition to ordinary apprentices, training candidates can take a competence examination, which gives them partial competence in the subject. A training candidate signs a training contract with a view to taking a less extensive examination than a craft or journeyman's

Figure 5.5: Applicants as per 1 March 2009, by programme as per 1 October 2009. Per cent.



Source: Norwegian Directorate for Education and Training 2010

examination (cf. Section 4-1 of the Education Act). At the same time, there were a total of 1,081 training contracts, 496 of which were new. The total percentage of new training candidates among new apprentices and training candidates is a little over three per cent. However, the percentage of training candidates varies considerably among the recognised trades from around ten per cent in *Agriculture, Fishing and Forestry* and *Restaurant and Food Processing* to less than one per cent in *Electricity and Electronics*.

The results of the applications in 2009

Everyone who applies to Vg1 for the first time is entitled to admission to one of three choices of an education programme. Research shows that being granted the primary choice of education programme and school has a positive effect on the likelihood that the pupil will remain in the education and training (Markussen et al. 2006) because being granted the primary choice is closely linked to motivation and completion. Therefore, it is interesting to take a closer look at whether the applicant is granted his/her primary choice of both education programme and school, even if the counties are not obligated to grant the primary choice of school.

Figure 5.5 shows the percentage of applicants as of 1 March 2009 who had been granted their primary choice by 1 October 2009, been given a second offer, had received no offer but registered in OT as of 1 January 2009, or had received no offer whatsoever. For applicants to school, being granted the primary choice means that the applicant has been granted his/her primary choice of both school and programme area, whereas, for applicants to an apprenticeship, being granted their primary choice means their choice of programme area.

The percentage of applicants who were granted their primary choice increased from Vg1 to Vg3 in school, which may indicate that the counties are dimensioning admissions to Vg1 according to the capacity farther along in the course of study. In Vg1, 69 per cent of the pupils have been granted their primary choice. This percentage increases to 73 per cent for the applicants to Vg2 and to 76 per cent for the applicants to Vg3.

The percentage of applicants to apprenticeship who have been granted their primary choice is considerably lower this year than in 2009. One of the main reasons for this may be that this year's figures are preliminary, whereas we were looking at final figures in 2009. However, it is not unlikely that the financial crisis has made it more difficult to obtain an apprenticeship this year than it was last year and that the decline is a result of a shortage of apprenticeships.

Many of the pupils who are not granted their primary choice begin in some other education and training, but there are also some who as of 1 October have received no offer. Among the applicants to Vg1, there was a total of six per cent who were not admitted to any upper secondary education and training as of 1 October 2009. The equivalent figures for applicants to Vg2, Vg3 and apprenticeship were 10, 8 and 37 per cent respectively. However, some of the pupils who received no offer will be given an offer at a later point in time.

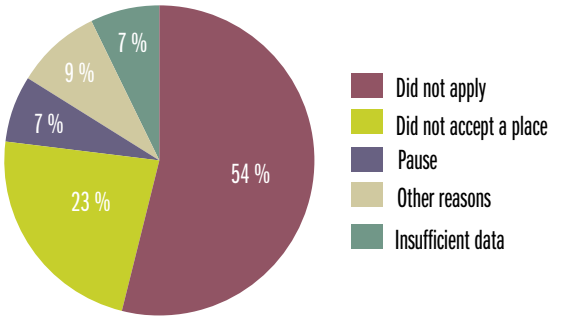
Many of the applicants who on 1 October had not received an offer had been reported to the follow-up service (OT) by January. Some of the pupils who were not reported to OT may have been given an offer of training after 1 October, and many do not have the youth right, so they are not in the follow-up service's target group.

As per 1 January 2010, 45,514 young people were registered in OT, i.e. 21 per cent of all the young people who have the youth right in Norway. Out of all the people who are reported to OT, 30,602 are in OT's target group. That amounts to 14 per cent of everyone who has the youth right. The remaining 15,000 young people were either erroneously registered in OT or the young people are registered in OT because the counties are working to prevent them from dropping out, but without the young people being in OT's target group, cf. Section 3-6 of the Education Act and Section 13-1 of its accompanying regulations. There are differences by county in both the number and the percentage of young people who are reported to OT.

The enrolment and status codes in which the counties report statistics to the Norwegian Directorate for Education and Training were implemented on 1 January 2006. Random samples show that there are certain differences among the counties with regard to how the coding is interpreted and used. On this basis, the coding and the instructions are to be reviewed once again. Despite some uncertainty associated with differing registration routines in the counties, we think that the figures at the national level provide us with useful information about the follow-up service.

Figure 5.6 shows reasons why the young people are reported to OT. 54 per cent of the young people are registered in OT because they have not applied for upper secondary education and training, and 23 per cent have reported to the service because they have refused to accept a school place or an apprenticeship.

Figure 5.6: Reasons why young people are reported to the follow-up service as per 1 January 2010. Per cent.

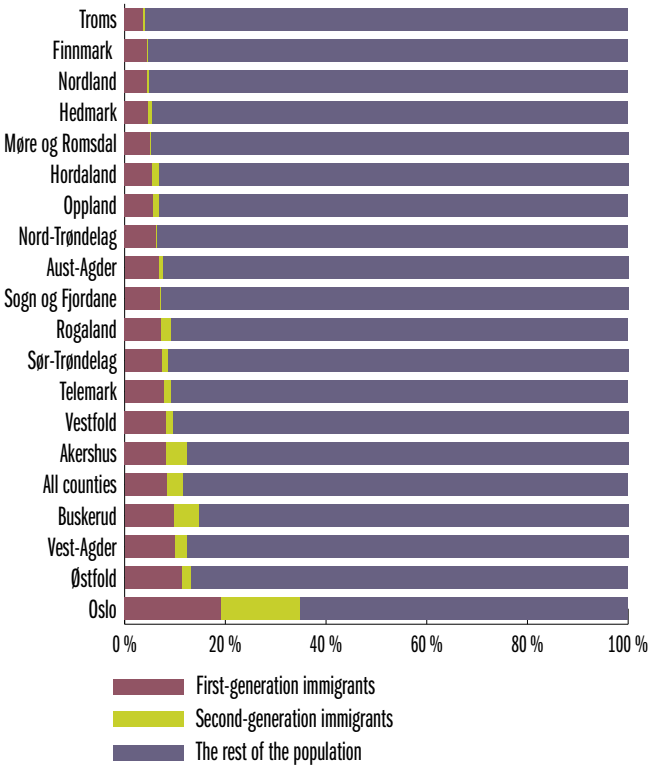


Source: Norwegian Directorate for Education and Training 2010

55 per cent of the young people in OT's target group as of 1 January 2010 were also registered in OT in the 2008-2009 school year. The young people who were registered in OT in 2008-2009 and as of 1 January 2010 do not distinguish themselves very much on the basis of the average of OT's target group in 2008-2009 with regard to the status code.

Figure 5.7 shows the percentage of young people reported to OT as per 1 January 2009 broken down among first-generation immigrants, second-generation immigrants and the remainder of the population by county. There are clear differences among counties.

Figure 5.7: Percentage of young people reported to the follow-up service as per 1 January 2009, broken down among first-generation immigrants, second-generation immigrants and the rest of the population, by county. Per cent.

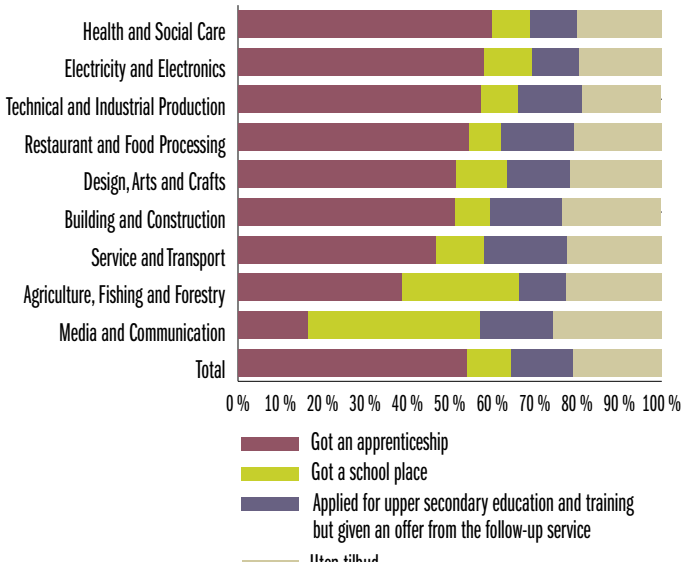


Source: The Norwegian Directorate for Education and Training 2009/Statistics Norway

Oslo differs in that 35 per cent of the young people who are reported to the services are first-generation immigrants or second-generation immigrants. The national average is 11 per cent. Another special feature in Oslo is that 16 per cent of the young people who are reported to OT are second-generation immigrants - the average for the rest of the country is three per cent. The percentage of first-generation immigrants and second-generation immigrants who are reported to OT in Oslo must be considered in the context that these groups are largest by far in Oslo. 25 per cent of the population of Oslo is first-generation immigrants or second-generation immigrants, whereas the national average is around 10 per cent (Statistics Norway 2008).

All in all, 54 per cent of the applicants for an apprenticeship had an approved apprenticeship contract by 1 October 2009, cf. figure 5.8. However, many of them were given an apprenticeship contract in the subsequent months, so the actual percentage of pupils who received an offer of an apprenticeship is greater than indicated in the figure. The percentage who did not receive an offer and the percentage in OT may therefore decrease somewhat. Ten per cent of the applicants for an apprenticeship are registered in some sort of programme in school.

Figure 5.8: Applicants for apprenticeship as per 1 March 2009, by programme as per 1 October 2009, by education programme. Per cent. Non-revised figures.



Source: Norwegian Directorate for Education and Training 2010

5.4 Completion, drop-out and level of education

In the public debate, there is considerable focus on completion of and drop-out from upper secondary education and training. Many of these discussions involve differences in the use of concepts and definitions. This may be unfortunate given the need to specify the extent of the challenge. Differences in the use of concepts may be related to the issues people consider to be the most important in their work. For example, the schools have a strong focus on drop-out from their particular school (institutional drop-out), whereas central government authorities focus most on the drop-out from the educational system in its entirety (system drop-out).

In the discussion about completion and drop-out, it is first of all important to specify the goal. For central government authorities, the main goal is that as many people as possible begin, complete and pass upper secondary education and training. Thus, the central authorities may initially disregard problems that may arise when pupils and apprentices switch from vocational studies to general studies, switch between or within educational programmes, or switch institutions, even though this can be perceived as a challenge for the individual education programmes and institutions.

After having specified the goal, something ought to be said about how long it is acceptable for pupils and apprentices to take to achieve the desired competence. This is what is defined as completion, and this is what is measured by Statistics Norway's school completion indicators.

Causes and consequences of failing to complete school and dropping out

Much research has been conducted on the factors that are the most significant for failing to complete and dropping out, and the importance of those factors varies with the type of drop-out that is being focused on, the way in which completion and drop-out are defined, and last but not least the factors that are included in the analyses. In general, however, it is possible to say that individual school achievements and the parents' educational background and earned income are the factors that have the greatest impact on completion and drop-outs.

Individual school achievements are the individual factor that has the greatest impact on the probability of completing upper secondary education and training (Markussen et al. 2006). High average marks increase the probability of completing school. In other words, pupils who succeed in school at one age level have better prospects of succeeding in the following years.

There are a number of studies of completion and drop-out that do not include information about marks. In these studies, factors that affect skills at the start of upper secondary school will have much more importance than they have in studies that include marks.

Both the parents' educational background and their earned income affect the young people's probability of remaining longer in education (Bratsberg et al. 2010). The higher the income and the longer the parents' education, the better the chances of completion of upper secondary school (Bratsberg et al. 2010). In addition, children of employed parents who have a positive attitude to the importance of education have a higher probability of completing upper secondary education and training than children of unemployed parents who have little education and less positive attitudes to the importance of education (Markussen et al. 2006).

For some individuals, failure to complete school may have a number of consequences. With regard to the further choice of education and work after upper secondary school, research shows that the individual factor that clearly has the greatest effect on what a pupil does in the period after upper secondary school is the competence they have when they leave upper secondary education and training (Frøseth 2008).

Those who drop out of the educational system are at risk of also dropping out of or ending up in marginal positions in the labour force. However, some of them find jobs without completing upper secondary education and training, especially in periods with low unemployment (Raaum et al. 2009). Thus, a lack of formal competence does not necessarily exclude the person from access to the labour market, but it may give access to uncertain and less attractive jobs (Larsen and Hompland 1999).

The seriousness of failing to complete school depends on whether the young people get jobs and remain in gainful employment. A report from the Ragnar Frisch Centre for Economic Research (Bratsberg et al. 2010) points out that the third of the pupils who do not complete upper secondary education and training in five years are overrepresented among the unemployed and that the percentage of unemployed persons decreases with the length of education. The same pattern repeats in a report from the Centre for Economic Research at NTNU (SØF) (Falch and Nyhus 2009). Bratsberg et al. also found that many of the pupils who quit school quickly found jobs. Many of them may have already had a job or very good prospects for employment when they quit school. At the same time, the study does not find that low unemployment in the municipality in which the young person resides tends to induce pupils to leave school early.

Many reports show that those who are employed without having completed upper secondary education and training have lower earned income than those who have completed upper secondary education and training (Bratsberg et al. 2010, Falch and Nyhus 2009, Opheim 2009). However, Bratsberg et al. also find that the level of income is higher for young people with partial competence from upper secondary school than for young people with only a lower secondary education. However, they caution not to draw the conclusion that the partial competence is the factor that results in the higher pay. Young people who almost complete upper secondary education and training probably have other abilities that directly affect their level of income, and they would have a higher income regardless of their partial competence than would those who have not achieved anything beyond primary and lower secondary school.

Those who did not complete upper secondary education and training also have a higher probability of being a job applicant and receiving a disability benefit than those who completed upper secondary education and training. They end up more often on social assistance, social security and in jail. It is uncertain, however, whether such effects can be attributed to education as opposed to other factors. In other words, it is not possible to say whether it is insufficient upper secondary education and training that results in these conditions or whether there are underlying factors that both affect the probability of completing upper secondary education and training and the probability of ending up in these conditions.

The social consequences of low completion of upper secondary education and training are considerable. Persons without upper secondary education and training have lower income, more tentative employment, a greater probability of making use of national insurance and social protection schemes and a greater probability of crime and poor health. Calculations performed by SØF (Falch et

al. 2010) show that if completion of upper secondary education and training is increased from 70 to 80 per cent, it will entail a cost reduction for the society of between NOK 5.4 and 8.8 billion for each cohort. That is equivalent to about 6,000 more pupils who complete upper secondary education and training in each Year class of pupils. Delayed completion is also a substantial expense. If everyone who completes school in a cohort had done so in the stipulated time, that would entail a savings of about NOK two billion. In other words, from an economic perspective, large savings can be attained by increasing the efficiency of the education system.

Completion

In 2009, the vast majority of pupils, about 97 per cent, started directly in upper secondary education and training after completing lower secondary school (KOSTRA 2009). This percentage has been relatively stable since the measurements commenced in 2004. Though we are unable to quantify it, we know that some of the pupils who do not have a direct transition to upper secondary education and training begin at a later date.

Available completion statistics from Statistics Norway mainly show that there are formidable challenges associated with getting pupils and apprentices through the education system in the stipulated time. One out of four pupils who began in general studies areas of study spends more than three years, and three out of five who began in vocational areas of study spend longer than four years completing and passing upper secondary education and training. The school completion percentage has been relatively stable since the introduction of Reform 94, so this is not a new challenge, cf. figure 5.9.

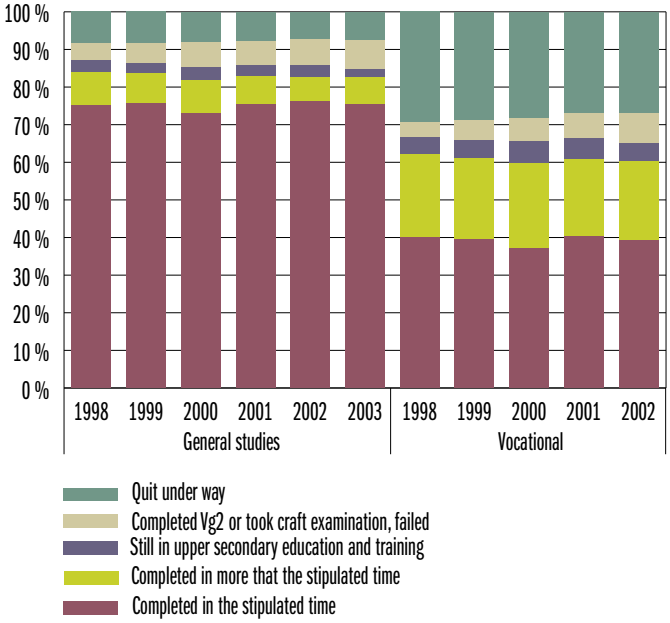
Figure 5.9 shows the completion when the youth right expires for the cohorts that began general studies areas of study from 1998 to 2003 and vocational areas of study from 1998 to 2002 (R94 cohorts).

There are small differences among the age cohorts with regard to the percentage who achieve university and college admissions certification or vocational qualifications in the stipulated time or during the time allotted to the youth right. The percentage who complete school in the stipulated time among pupils in general studies areas of study in 2003 is roughly equivalent to the previous age cohorts. The percentage of pupils in general studies who have quit school is somewhat lower for the 2003 cohort than for previous cohorts, but at the same time the percentage who complete without passing has increased somewhat.

The percentage of pupils in vocational areas of study who completed school in the stipulated time are at about the same level for the 2002 cohort as for previous cohorts. Although the percentage who quit school is somewhat lower, the percentage who completed without passing increased.

There are big differences in completion and progression between pupils in general studies and pupils in vocational areas of study. The figure shows that pupils in vocational studies spend more time completing school than pupils in general studies. More than 70 per cent of the pupils in programmes for general studies completed their

Figure 5.9: Achieved competence at the Vg2 level five and six years after pupils began school in general studies and vocational areas of study respectively for the age cohorts 1998-2003 and 1998-2002 (R94). Per cent.



Source: Statistics Norway 2010

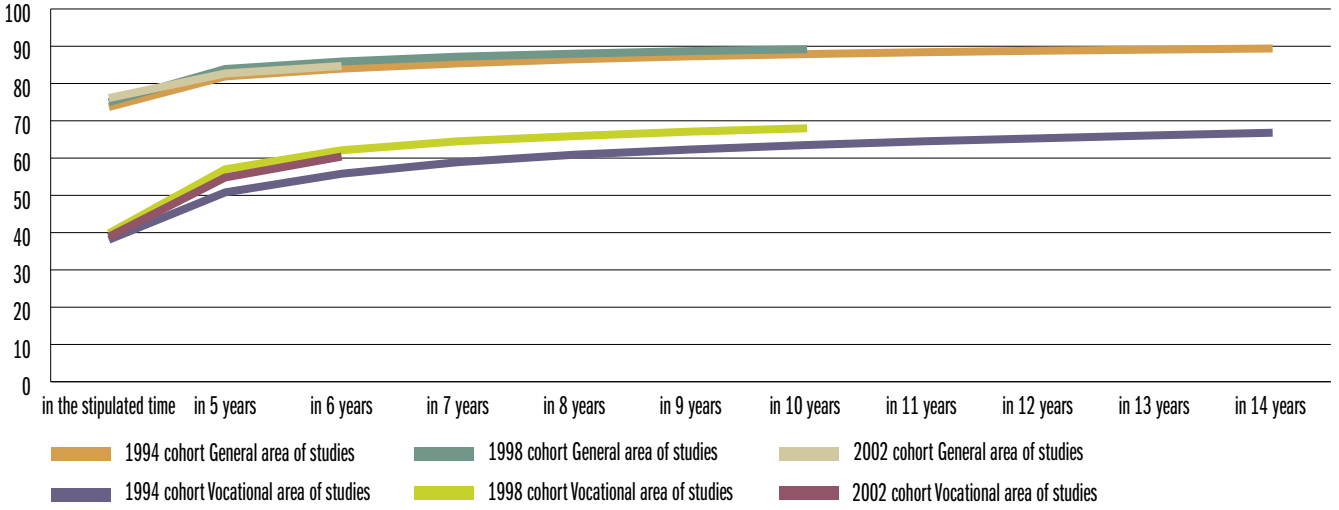
studies in the stipulated time, and more than 80 per cent completed upper secondary education during the youth right period. By comparison, around 40 per cent of the pupils in vocational programmes completed school within the stipulated time and around 60 per cent completed their education during the youth right period.

Another major difference between pupils in programmes for general studies and those in vocational programmes is evident from the percentage who quit under way. The percentage of pupils who quit vocational programmes varies from 27 to 29 per cent among the five age cohorts. The corresponding figures for pupils in programmes for general studies are seven to eight per cent for all six age cohorts.

The national figures mask major geographical differences (cf. table 5.8 of the appendix). For the pupils who began in the general studies areas of study in 2003, the two northernmost counties and Hedmark County have the lowest percentage of pupils who completed their education in the stipulated time. However, these counties, and especially Finnmark County, have a high percentage of pupils who complete school in more than the stipulated time. Thus, the percentage who quit school is not very far from the average for all of the counties combined.

For pupils who began in vocational areas of study in 2002, Finnmark County stands out with a very low percentage who complete school in the stipulated time, just a little over half of the average. Nordland and Troms counties are the two counties that have the next highest percentage after Finnmark of pupils who quit in the vocational areas of study. There are small differences among the counties in the percentage who complete school in more than the stipulated time. Sogn og Fjordane, Nordland and Finnmark have the highest percentage of pupils still in upper secondary education and training.

Figure 5.10: Pupils and apprentices who have completed and passed upper secondary education and training, by age cohort, number of years since commencing upper secondary education and training and area of study. Per cent.



Source: Statistics Norway 2010

Oslo has a high percentage who complete without passing. Østfold, Nordland and Finnmark are the three counties with the highest percentage of quitters.

The percentage of pupils in the age cohorts who complete upper secondary education and training is lowest in the northernmost counties. All three counties have low percentages who complete with general university and college admissions certification or vocational qualifications and high percentages who are still in upper secondary education and training. A report from SØF shows that this can probably not be attributed to the characteristics of the pupils because the picture does not change when the parents level of education and the results from primary and lower secondary school are compensated for (Byrhagen et al. 2006). Another SØF report shows that the differences can also not be explained by a lack of educational programmes in the vicinity of the pupil's home or by regional labour market conditions (Falch et al. 2010b).

Figure 5.10 shows first and foremost that there are many pupils who complete and pass upper secondary education and training after the end of the youth right period. All in all, the percentage of pupils who had completed and passed upper secondary education and training ten years after they began was around 80 for the 1998 age cohort, i.e. considerably higher than the percentage who had passed after five years.

As shown in figure 5.9, the percentage who completed and passed was higher for the general studies areas of study than for the vocational ones. From the end of the youth right period until ten years later, the percentage who had completed and passed general studies areas of study increased from 82 to 90 per cent of the beginning cohort. For vocational studies, the percentage increased from 56 to 67 per cent.

For general studies education programmes, there were small changes in the percentage who completed and passed from the 1994 to the 2002 cohort. For vocational studies, there was an increase in the percentage of pupils who completed and passed from the 1994 cohort to later cohorts. For the 1998 cohort, the percentage who had completed and passed after ten years was 68 per cent, six per cent higher than for the 1994 cohort.

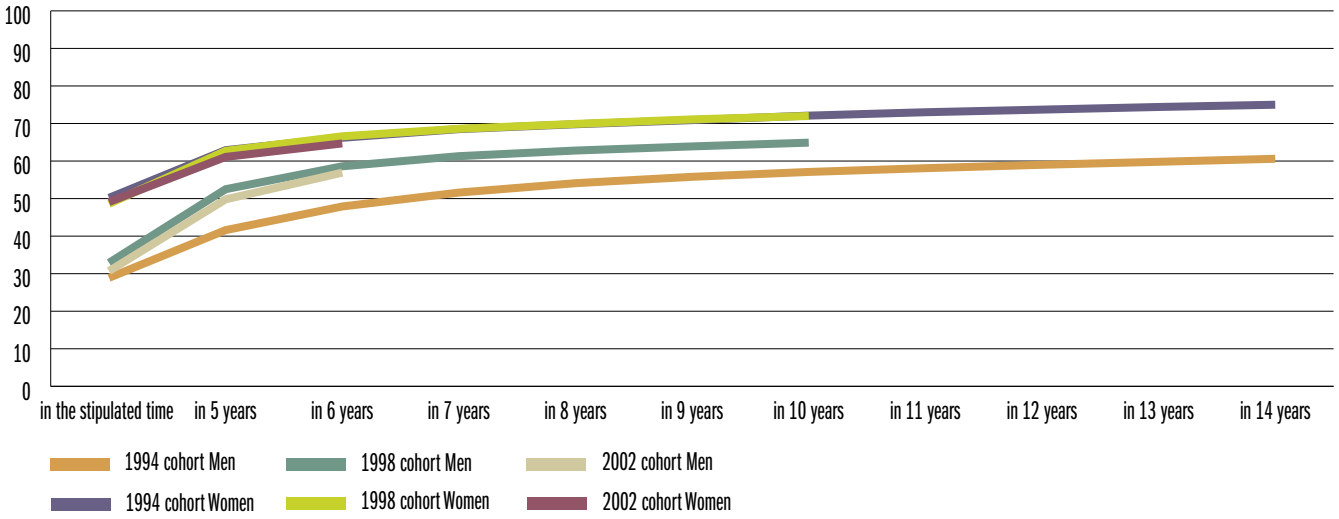
The improvement in completion from the 1994 to the 1998 cohort can mostly be ascribed to higher completion for men in vocational studies, cf. figure 5.11. The figure shows that the completion for girls in vocational studies was higher and more stable than the completion for boys.

Despite the low completion percentage, there are currently more pupils who complete and pass upper secondary education and training than at any time before. Figure 5.12 shows the percentage of the whole population who had completed and passed upper secondary education and training or even higher education in 2008 compared with previous years.

The general picture is that the population has a higher level of education in 2008 than in previous years. Since 1970, a much greater percentage of each youth cohort has achieved competence at the upper secondary level.

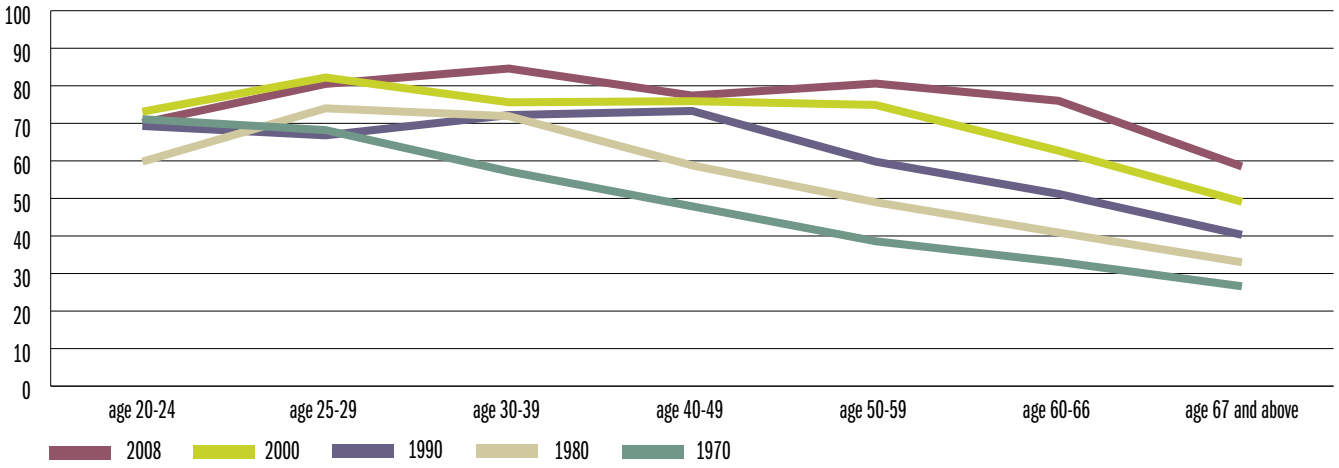
The increase in the percentage who have upper secondary education and training or more from the 20-24 year-old age cohort to the 30-39 year-old age cohort in 2008 indicates that many adults take advantage of the opportunity to formalise their competence at the upper secondary level after the end of the youth right period. This applies to both those who are entitled by their statutory rights as an adult to complete upper secondary education and training and those who take and pass craft or journeyman's examinations as candidates for experience-based trade certification. In 2008, we see that the percentage who had not completed and passed upper secondary education and training was halved from 30 to 15 per cent from the end of the youth right period up to the 30-39 year-old age group.

Figure 5.11: Pupils and apprentices who have completed and passed upper secondary education and training, by the number of years since vocational education and training commenced. Age cohort and gender. Per cent.



Source: Statistics Norway 2010

Figure 5.12: Percentage of the population with at least upper secondary education and training by age group. Per cent.



Source: Statistics Norway 2010

A significant percentage quit upper secondary education and training before they have completed and passed. However, many achieve partial competence, and figure 5.13 shows the highest achieved competence five and six years after the first Year was begun.

The figure shows that most of the pupils, 83 per cent, who began in general studies areas of study completed and passed Vg3. Another ten per cent passed Vg2, and three per cent passed their first Year. Only three per cent of those who began in general studies areas of study quit without having passed their first Year.

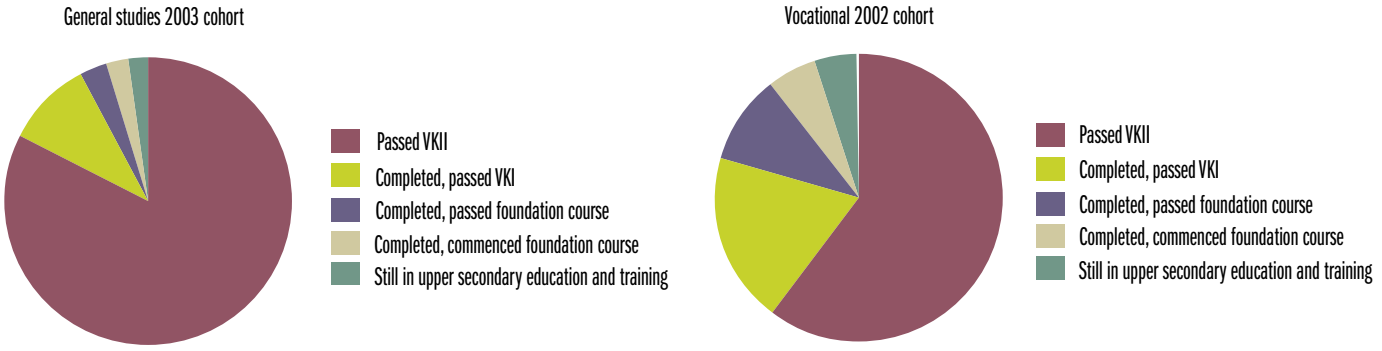
For vocational areas of study, the picture is slightly different because only 60 per cent had completed and passed Vg3 and/or a craft certificate within six years after the commencement of study. Another 19 per cent had passed Vg2 and ten per cent had passed their first Year. Six per cent of those who began in vocational areas of study quit without having passed their first Year.

The low completion is often interpreted to mean that the drop-out rate is high. However, the close relationship between the percentage who have completed and passed and time means that we have to be careful about defining those who have not completed and passed after five years, for example, as drop-outs. Many of the pupils whom the completion indicator at Statistics Norway defines as having quit are in a course of study working toward competence at the upper secondary level or have planned to achieve competence at a lower level. The rate of completion should rather be regarded as an indicator of the effectiveness of the educational system – how high a percentage of the pupils and apprentices complete and pass in the course of the desired period of time?

Transitions and drop-out

The majority of those who begin in upper secondary education and training complete and pass upper secondary education and training. These pupils achieve either competence for higher education, vocational qualifications or a craft or journeyman's certificate. However,

Figure 5.13: Highest achieved competence five and six years after commencement of upper secondary education and training for the age cohorts 2003 and 2002 (R94) by area of study. Percentages.



Source: Statistics Norway 2010

it is relatively common that pupils and apprentices drop out of their education and disappear from the educational system at times. Some of them quickly return to their education, while others are gone for a long time. As a theoretical concept, drop-out is generally used to describe phenomena that suggest that there is a more serious reason for a pause in a pupil's education.

There can be many good reasons why someone chooses to drop out of the educational pathway for a short period of time (lack of motivation, travel, a stay abroad, pregnancy, illness), but there are often more serious reasons for longer drop-out. Research shows that

> "many pupils take a one-year break from school without any risk of serious consequences, such as marginalisation and social exclusion, but for those who do not return after one year, the probability of returning to education is low." (Raaum et al. 2009).

In order to get a correct idea of the magnitude of this problem, we should distinguish between short breaks (a pause) and longer breaks (drop-out). In order to identify the magnitude of the problem, it is also necessary to identify when the drop-out occurs in the educational pathway.

Statistics Norway (KOSTRA) annually publishes indicators of transitions in upper secondary education and training. These analyses look at the status of an age cohort at a certain Year from one year to the next. Most pupils continue on to the next Year, but many change their course of study in the same Year, repeat a Year, or quit upper secondary education and training. In order to get a picture of the drop-out rate, additional calculations have been made of the percentage of pupils who were not in education and training two years in a row and who had not passed their education and training. The numbers show that many of the quitters return to their education after two years.

Table 5.10 shows transitions and drop-outs for the first three Vg1 age cohorts after the introduction of the Knowledge Promotion Reform. For general studies education programmes, we can observe a decline in the percentage who made a direct transition from Vg1 to Vg2 and an equivalent increase in the percentage who were not in education one year later. However, over half of these pupils returned to their education after two years.

For vocational education programmes, there is an increasing percentage of pupils who make a direct transition from Vg1 to Vg2 and a corresponding decline in the percentage who are not in any education and training one year later. About one third of the latter return to education and training the year after that.

The overall picture is relatively stable, but there has been a slight increase in direct transitions from Vg1 to Vg2 the following year and a corresponding decline in the percentage of pupils who repeat Vg1. The percentage of pupils who are not in any education or training the following year remains stable, but the percentage who return to education and training two years later increased from the 2006 to the 2007 age cohort. All in all, about half of the pupils who quit their education and training from one year to the next return to their education and training two years later.

Table 5.11 shows transitions and drop-out for the first two Vg2 age cohorts after the introduction of the Knowledge Promotion Reform. For general studies education programmes, the two age cohorts are relatively similar, but there is a slight decline in the percentage of pupils who made a direct transition from Vg2 to Vg3 and an equivalent increase in the percentage who were not in education one year later. About half of the pupils who quit their education and training between Vg2 and Vg3 return one year later.

For vocational education programmes, there is a clear decrease in the percentage of pupils who go over to apprenticeship from Vg2. One possible explanation for this may be that there are only preliminary figures for the 2008-2009 age cohort, and the preliminary apprenticeship figures are considerably lower that the final figures because the approval of contracts is far behind schedule. As a result of this decrease, there is a higher percentage who are not in education and training the following year. About one third of those who are not in education and training the following year return to education and training the year after that. Otherwise, the percentage of pupils who go from Vg2 vocational studies to Vg3 competence for higher education increased slightly.

Table 5.10: Transitions and drop-out from Vg1 2006-2007, 2007-2008, 2008-2009. Per cent.

	General studies			*Vocational studies*			*Total*		
	2006-2007	2007-2008	2008-2009*	2006-2007	2007-2008	2008-2009*	2006-2007	2007-2008	2008-2009*
In Vg2 the following year	88.2	86.7	86.5	73.0	74.3	76.2	79.8	80.0	80.9
Change of course in Vg1 the following year	3.7	3.8	3.1	7.2	7.3	7.4	5.6	5.7	5.4
Repeating Vg1 without changing course the following year	0.9	1.0	1.0	3.9	3.4	3.5	2.6	2.3	2.3
In other education the following year	1.3	1.6	0.8	3.0	2.7	2.1	2.3	2.2	1.5
Not in upper secondary education and training in Norway the following year	5.9	6.8	8.7	12.8	12.3	10.8	9.7	9.8	9.8
Not in upper secondary education and training in Norway two years later	2.7	2.1	.	9.3	8.3	.	6.3	5.5	.

* Preliminary figures
Source: Statistics Norway 2010

Table 5.11: Transitions and drop-out from Vg2. 2007-2008, 2008-2009. Per cent.

	General studies		Vocational studies		Total	
	2007-2008	2008-2009*	2007-2008	2008-2009*	2007-2008	2008-2009*
In Vg3 the following year	94.3	93.7	.	.	44.5	44.1
In apprenticeship the following year	.	.	37.6	31.4	19.9	16.6
In Vg3 vocational qualifications the following year	.	.	3.6	3.7	1.9	1.9
In Vg3 competence for higher education the following year	.	.	26.4	27.6	14.0	14.6
Change of course in Vg2 the following year	1.2	0.7	3.2	3.7	2.2	2.3
In other education the following year	1.5	1.9	5.7	5.9	3.7	4.1
Not in upper secondary education and training in Norway the following year	3.0	3.7	23.4	27.7	13.8	16.4
Not in upper secondary education and training in Norway two years later	1.7		16.0	.	9.3	.

* Preliminary figures
Source: Statistics Norway 2010

The total picture is that the percentage who continue in education and training the following year is lower, and the percentage who are not in education and training the following year is increasing, but, as mentioned, this may be due to preliminary apprenticeship figures. One third of those who are not in education and training the following year return to education and training the year after that.

Completion, drop-out and level of education

In conclusion, it is important to emphasise that indicators of completion, level of education and drop-out must not be confused, but that they may be regarded as different indicators in related problems.

Completion tells us the most about the effectiveness of the educational system at getting pupils and apprentices to achieve competence at the upper secondary level. The level of education tells us the most about how well-equipped the population is to tackle the challenge of increasing competence requirements. Finally, drop-out tell us the most about how many pupils are experiencing major problems adapting to upper secondary education and training so that they have an increased risk of experiencing social exclusion. All three indicators are necessary in order to document the status of upper secondary education and training.

6 Quality improvement

The theme of the chapter on quality improvement this year is teachers and school leaders – recruitment and competence.

The chapter first takes a look at international developments in the fields of school leadership and teacher competence. Among other things, the summaries consider selected results from the OECD reports *Improving School Leadership, Teaching and Learning International Survey* (TALIS) and *Trends in International Mathematics and Science Study – Advanced* (TIMSS Advanced). That is followed by a presentation of some important national measures and target areas that are especially focused on the teaching profession. These are measures to increase recruitment and to improve teacher training, the follow-up of newly qualified teachers and continuing and further education. Finally, there is a presentation of the newly established education programme for head teachers, which comes under the *Nasjonalt rektorprogram* (National Training Programme for Head Teachers).

The pupils' learning environment and learning outcomes are dependent on teachers with a high level of professional competence and school leaders with good leadership qualifications. Therefore, recruitment of teachers and school leaders with the right qualifications is one of the most important policy instruments for meeting the quality challenges in the school.

The Reports to the Storting *Kvalitet i skolen* (Quality in schools) (2007–2008) and *Læreren – Rollen og utdanningen* (The Teacher – Role and Training) (2008–2009) promote several measures that have the objective of improving recruitment to the teaching profession and that focus directly on competence and the roles of teachers and school leaders. Some of the measures are currently under research-based evaluation, and the results of the research will be presented in future editions of *The Education Mirror*.

6.1 International trends - school leadership

The report *Improving School Leadership* (OECD 2008) deals with school leadership in 22 member countries, including Norway. The report sheds light on important factors that affect this field, e.g. historical, political, demographic, social and cultural factors. In this kind of international, comparative perspective, there are numerous common features. In many countries, school leadership is given high priority, but the recruitment to leadership positions is weak. This increases the relevance of topics related to the school system, such as organisation, leadership qualifications, leadership roles and responsibility.

The OECD report concludes with four recommendations to all participating countries about how they can improve the conditions for school leadership:

1. *Redefine roles and responsibilities for the school leaders*
   The role of school leader has changed in recent years, not least as a result of the introduction of the scheme with so-called dual-level municipalities. In many places, the school leaders have been delegated much greater responsibility than previously without strengthening the support for the leader. As a result, the leadership tasks entail a great deal of administration, a certain amount of personnel management and less academic leadership. There are good reasons why the reverse ought to be the case.

2. *Let many people take part in the leadership tasks*
   Leadership can be described through particular functions and tasks. Someone must perform these functions and tasks, but it does not have to be the leader him/herself. The leader is the responsible, but many tasks can be delegated, and many persons ought to be mobilised to take part in the leadership tasks.

3. *Develop knowledge about and skills in school leadership (Effective School Leadership)*
   Very many school leaders want and need to improve their competence. They need management education, management training and management development. It is challenging to establish better, more relevant and more beneficial programmes than those that exist at present.

4. *Make school leadership an attractive career path*
   At present it is difficult to recruit school leaders. That is true of Norway, and likewise most other OECD countries. It is a major challenge to make it so attractive to become a school leader that the best candidates can be recruited.

In England, the *National College for Leadership of Schools and Children's Services* has addressed many of the leadership challenges that the OECD report calls attention to. Systematic management education has been implemented for the whole school sector, with a high academic level, with the focus on skills training and with differentiated and individual solutions for each individual leader. The goal for the National College is to recruit, develop and keep school leaders and to give them follow-up, guidance and good leadership tools. The latter of these goals is especially channelled through the institution's website, which has been developed over a number of years and has extensive programmes and schemes for support to school leaders.

In Sweden, they have had Rektorskolan (a school for educating Swedish school leaders) since 1976, an educational programme that was compulsory in the first fifteen years for head teachers who were already employed. In 2009, the education underwent a major revision in both content and structure and was given a certain number of new programmes and actors. At the same time, a website for school leadership was developed, which offers a broad selection of literature and tools for supporting and offering guidance to school leaders.

The experiences and advice from England and Sweden are unanimous: the central government ought to keep the management education going, closely follow-up the actors and make sure that they have sufficient academic competence.

In Norway, the efforts to train head teachers (cf. Section 6.5) are inspired in part by the results and recommendations from the OECD survey (OECD 2008), partly by a recently initiated collaboration with the National College in England and with the Swedish Education System, which is in charge of the new *Rektorsprogrammet* (National School Leadership Training Programme) 2009.

6.2 The international OECD survey of teaching and learning (TALIS)

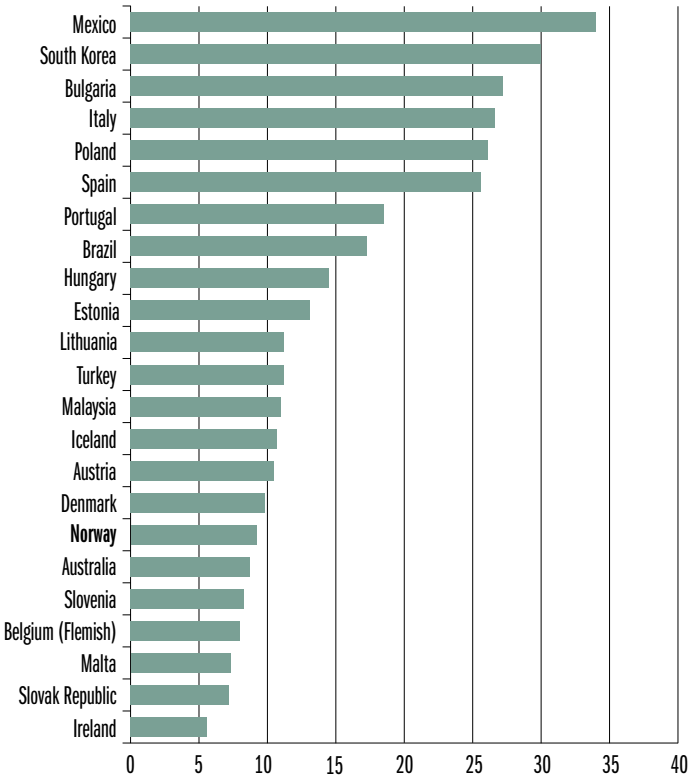
The TALIS survey is based on an international awareness of the school's role as a social institution, of the teacher as the school's most important resource and of the relationships between the quality of the teaching and the quality of the learning. Inherent in this is also an awareness that both the teaching profession and the role of the school leader must be regarded as attractive.

Many national and international surveys show that the Norwegian school faces challenges with regard to both the quality of the teach-

Teaching and Learning International Survey (TALIS)

TALIS is an international, comparative study conducted for the OECD that covers teaching and learning in 23 countries. The study focuses on the roles of teachers and school leaders in lower secondary school. The background for the study was enhanced requirements for quality in the schools, which in turn resulted in enhanced requirements and expectations as to how key actors perform their profession. Competence, experience and attitudes to the performance of the role of the teacher and the role of the school leader are some of the main themes in the study, which is a major survey of teachers and head teachers. The name of the OECD report from the study is *Creating Effective Teaching and Learning Environments* (OECD 2009). In Norway, the study was conduced by NIFU STEP, and the results are presented in the report *Å være ungdomsskolelærer i Norge* (Being a lower secondary school teacher in Norway) (Vibe et al. 2009).

Figure 6.1: Academic and professional development. Course days for teachers in 23 countries. Average.



Source: Vibe et al. 2009

ing and the learning of the pupils; cf. the results of international surveys such as PISA and TIMSS. Taking this into account, we shall present a few selected findings here from the TALIS survey, as a contribution to the knowledge base for quality improvement in primary and secondary education and training. These findings shed light on conditions that are challenging to the Norwegian school system, related to teacher competence and school leadership, feedback and assessment, teaching practices, interaction and cooperation. TALIS provides no direct information about consequences for the learning outcomes of the pupils.

The teacher and the school leader in Norwegian lower secondary schools

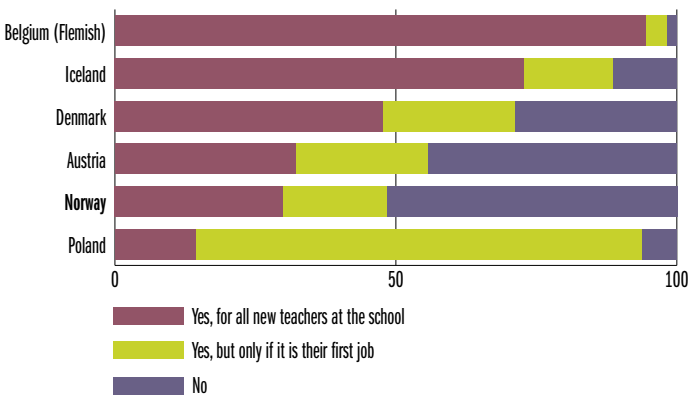
Quality improvement in the school system is related to professional development. Norwegian lower secondary school pupils have experienced teachers who enjoy their work, are secure in their role as a teacher and are satisfied with their job. One of the special characteristics of the age distribution among teachers is that many are over age 50 and few are in the 40-49 age group (cf. chapter 1 on the age distribution of the teaching staff in primary and lower secondary school as well.) When it comes to formal qualifications, there are roughly just as many teachers with general teacher training as there are teachers with higher education at either the undergraduate level or the graduate or masters degree level.

Figure 6.1 shows considerable variation among the TALIS countries when it comes to participation in continuing and further education. Norwegian teachers are among those who participate the least in organised academic and professional development. Norway is one of the countries where teachers had fewer than 10 course days in the last 18 months, whereas the average for all of the TALIS countries is 15 days. On average, the course participation is greatest in the 40-49 year-old age group. The low participation is especially clear when we keep in mind that the teachers themselves have expressed a strong interest in participating in more activities to improve their qualifications. Other research (Hagen et al. 2006, Desimone 2009) shows that brief courses do not have the perceived usefulness and the desired effect on teaching practices. Norwegian teachers' needs for more competence are especially related to teaching pupils with special needs, ICT skills for teaching and pupil assessment practices. The teachers experience a lack of support and facilitation from the school leader and/or the employer as barriers to increased participation.

In Norwegian schools, very few specific and formal measures are taken offering support, guidance and facilitation to newly employed teachers. Figure 6.2 shows that formal integration processes for Norwegian teachers have been incorporated or arranged much less frequently than in six other countries with which Norway is compared. However, there are a number of obvious regional differences in the Norwegian material. Schools in Oslo and Akershus counties are clearly distinguished with more systematic follow-up of newly employed teachers from schools in the rest of the country.

In the TALIS survey, a distinction is drawn between administrative leadership and instructional leadership. Norwegian school leaders perform their leadership roles by attaching greater importance to administrative than to instructional leadership. The school leadership in lower secondary school gives priority to accountability and management by rules. Less importance is clearly attached to management for school goals, instructional management and direct supervision of instruction in the school. This is especially true of the control dimension, and is apparent, for example, in that the teachers report that school leaders are not very active when it comes to observation of the teaching and advice about follow-up.

Figure 6.2: *When a teacher begins to teach at this school, he/she is given an offer to take part in a formal introductory process.* Selected countries.



Source: Vibe et al. 2009

The two forms of leadership are not in opposition to each other, but Norwegian school leaders practice a relatively passive form of instructional leadership. This can be seen in connection with the findings that show inadequate facilitation of competence building and guidance of newly employed teachers. Otherwise, the survey shows that it is important to have clear leadership in the school, whether the leadership is mainly instructional or administrative.

One necessary condition for a common school culture is common awareness that a good dialogue, interaction and cooperation are necessary among the participants in the various arenas in the school; i.e. between pupils and teachers, between teachers and school leaders and between school leaders and school owners. The findings in the TALIS survey indicate several main challenges for teachers, school leaders and school owners, and they are related to both attitudes and competence.

TALIS suggests that many Norwegian teachers follow up their pupils less than teachers in most other participating countries. They rarely correct homework and the pupil's workbooks, rarely set clear learning goals and are less likely to follow up the pupils' learning. The teachers leave a lot up to the pupils, but not very many pupil-oriented practices are conducted either, and the pupils are not very often included in the planning of the teaching. Activities such as project work are not very often used either. That suggests that many Norwegian teachers have an unclear way of teaching (Vibe et al. 2009).

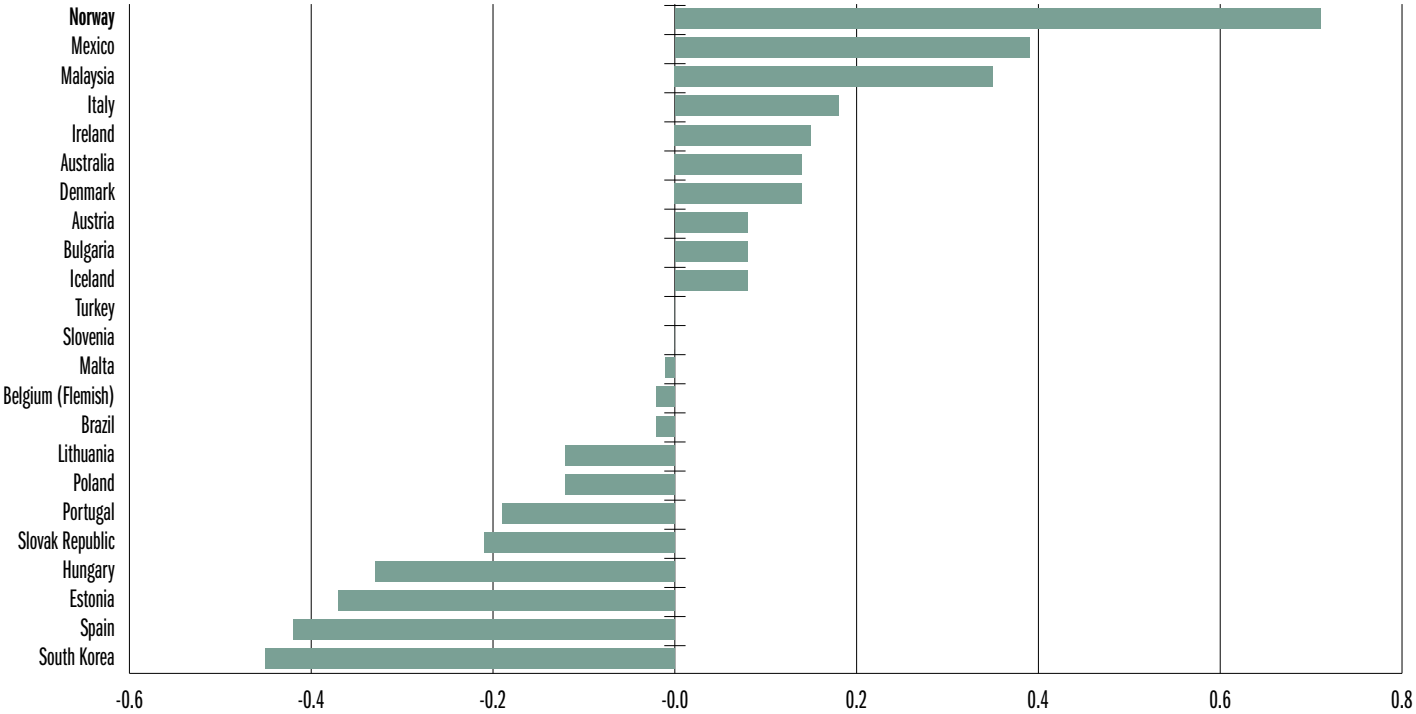
The poor feedback culture is also evident in the relations between the school owner and the school and between the school leader and the teachers. One disturbing finding is that Norwegian teachers agree to a greater extent than teachers in other TALIS countries that substandard work is tolerated by the collegium at the school. Among the Norwegian teachers, 60 per cent say that they agree with this statement, whereas the average for all of the countries is one third.

Norwegian teachers cooperate with each other to a relatively great extent, but this cooperation mainly involves the practical coordination and allocation of tasks. The work in the classroom is by and large an individual responsibility, and there is little professional cooperation aimed at promoting academic improvement, as a reflection and improvement of practices. TALIS shows that the cultures of evaluation and cooperation are related. Instructional leadership is related to a culture of cooperation, and clear leadership is related to a good classroom climate and good relations between teachers and pupils. It is the latter in turn that creates a good classroom environment.

In connection with quality improvement in the school, role comprehension, school leadership, classroom management and cultures of evaluation and cooperation are important factors. These topics must also take a key place in a comprehensive perspective of competence. Knowledge about the use of various tools for local external and internal assessment and about their utility is relatively weak in the Norwegian school system (Allerup et al. 2009), but ought to be included in a systematic and comprehensive improvement effort.

It appears that the school leaders put the most emphasis on classroom management, pupil discipline, pupil conduct and the relationship between teachers and pupils as criteria for assessment. In addition, teachers point out that it is important to have good cooperation with colleagues. The fact that teachers report that there is tolerance of poorly executed work over a period of time and that on the whole they experience appraisals and feedback as irrelevant and not spe-

Figure 6.3: Confidence in their own teaching (Self-efficacy). All 23 countries.



Source: Vibe et al. 2009

cific enough becomes apparent as a clear challenge for Norwegian school leadership when it comes to the pedagogical practicing of the leadership role and the professional practicing of the teacher role.

The findings from TALIS show that there is a need for objective, continuous, experience-based, varied competence building for teachers and leaders in order to be able to increase their competence in key areas in the Norwegian primary and lower secondary school. In these efforts, the school owner plays a key role in both a recruitment and a follow-up perspective.

The TALIS survey also points out certain aspects where the Norwegian school system does stand out positively. The relations between teachers and pupils are good, Norwegian teachers enjoy their work, and they have considerable confidence in their own teaching (self-efficacy).

Figure 6.3 shows how the teachers in each country did in the *self-efficacy* index. This index is designed and based on the extent to which the teachers are in agreement with four different statements. The average for all of the participating countries is set equal to 0 so that the scores are positive and negative relative to this average. The figure shows that the Norwegian teachers are the ones who have the highest self-efficacy (Vibe et al. 2009). Together with high satisfaction in their job and good classroom climate, this index provides a good basis for further improvement of the Norwegian teacher's role.

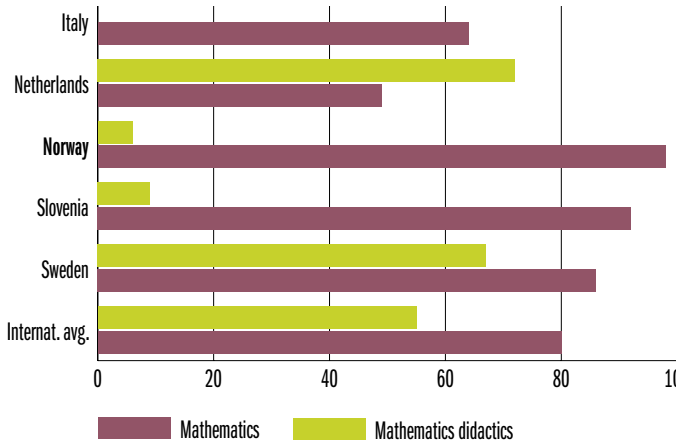
6.3 Teacher competence and the role of the teacher in teaching science – TIMSS Advanced 2008

The results for the pupils in mathematics and physics in the study TIMSS Advance 2008 are discussed in chapter 3. The study also covers the competence of the teachers and how the role of the teacher is practiced with regard to the pupils who take full in-depth study in theoretical mathematics (3MX) and physics (3FY) in upper secondary education and training. This is also related to teacher competence in the natural sciences in primary and lower secondary school. Teachers who instruct pupils with in-depth study in mathematics and physics in upper secondary education and training in Norway have a high level of academic competence in mathematics and physics, cf. figure 6.4 for competence in mathematics.

The picture of teachers' education is completely different for teachers who teach mathematics in the Norwegian primary and lower secondary schools compared to teachers in upper secondary schools. The TIMSS studies in 2003 and 2007 clearly showed that there were considerably fewer Norwegian mathematics teachers in Year 8 who had specialisation in mathematics than, for example, in Sweden (Grønmo and Onstad 2009, Grønmo et al. 2004). The question of specialisation was not asked of the teachers in Year 4 in TIMSS, but national data shows that insufficient specialisation in mathematics is an even bigger problem in the primary schools (Lagerstrøm 2007).

In the spring of 2008, the teachers of pupils who have in-depth study in mathematics (3MX) and physics (3FY) were asked whether they had taken part in continuing education during the last two years.

Figure 6.4: The percentage of mathematics teachers in TIMSS Advanced who state that they have specialisation in mathematics and mathematics didactics. Five selected countries.



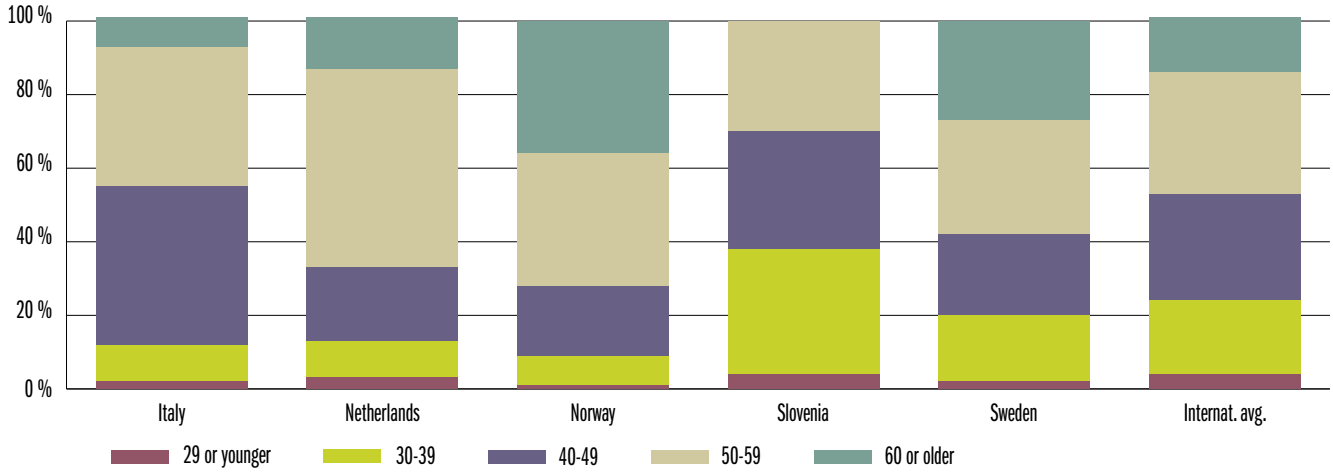
Source: Grønmo et al. 2010

Their responses show that Norwegian teachers take part less often in professionally relevant continuing education than teachers in other countries. Their participation was below the international average associated with continuing education in three of the areas in mathematics: *teaching methods, problem solving, and assessment*, and it was equal to the international average for participation in continuing education in *the curriculum in mathematics*. The only area where Norwegian teachers participate more than the international average is in the *use of ICT* in mathematics teaching.

Norwegian physics teachers participate relatively often in continuing education in academic physics topics; 59 per cent have taken part in this kind of pure academic physics continuing education in the last two years. The physics teachers also have a relatively high degree of participation in continuing education with regard to *the curriculum in physics* (46 per cent) and in the *use of ICT* (40 per cent). In areas that have a considerable effect on the pupils' performance in physics, it looks as if Norwegian physics teachers have a very low degree of participation. Only two per cent of Norwegian physics teachers have taken part in continuing education that deals with *improving the pupils' critical thinking* or in *problem solving*, and around 12 per cent have attended courses about individual *assessment* of the pupils in physics.

If we look at the number of years that the teachers have taught, the Norwegian mathematics teachers are highly experienced. Figure 6.5 shows the age distribution of the 3MX teachers in Norway and the equivalent teachers in other selected countries that took part in TIMSS Advanced. Norway clearly has the oldest teachers of the countries in the survey. 73 per cent of the Norwegian teachers have turned 50, and they are evenly distributed between the 50–59 and over 60 year-old age groups. The physics teachers in Norway also have a high age; 60 per cent of them are age 50 or more. Thus, in Norway there is a great need to recruit well-educated physics and mathematics teachers to replace all of those who will be retiring in the coming years.

Figure 6.5: The mathematics teachers in TIMSS Advanced by age group. Per cent.



Source: Grønmo et al. 2010

In the report from TIMSS 2003 (Grønmo et al. 2004) and PISA 2003 (Kjærnsli et al. 2004), it was pointed out that a modification of the teaching and a change in the role of the teacher might appear to be contributing causes of the big decline in pupil performance that began in the 1990s and has continued on into the 2000s.

"We see a marked accentuation of *responsibility for own learning*, pupilcentred forms of teaching, independent learning efforts, project work and self-assessment. As a result, the altered pupil roles have resulted in a new teacher role. In keeping with the focus on the pupils' independent learning efforts, the teacher's task has been to facilitate matters so that learning can occur. Simply stated, we can say that the role of the teacher has changed from teacher/presenter to advisor." (Kjærnsli et al. 2004).

The international results of TIMSS Advanced indicate that the role of the teacher is much more that just being a facilitator and advisor. They appear to indicate that the role of the teacher entails being a clear leader of the class to a greater extent by giving and following up homework and varying the methods of working in the periods of instruction.

6.4 Measures for increasing recruitment and strengthening the role of the teacher

Recruitment of new teachers

The Danish School of Education and *the Danish Evaluation Institute* wrote a report in 2009 for the Nordic Council of Ministers concerning the problem of recruiting student teachers in the Nordic countries. The report shows that the declining status of teachers in society makes it more difficult to attract young people to education. The report is based on interviews and on a survey of pupils in upper secondary school and student teachers from all five of the Nordic countries. The respondents emphasise that the teaching profession is very important for the society. Especially in Denmark, Norway and Sweden, however, the lack of good role models and much negative media publicity have combined to make it seem less attractive to be a teacher, according to the respondents.

The only country that distinguished itself in the survey was Finland, and the reason is that people there have great respect for both teacher training and the teaching profession. Among other things, that means that there are twice as many applicants as study places in the teaching programme of study. The number of applicants in the other Nordic countries has fluctuated, but the main trend is that it has been declining.

In Norway, there was a substantial increase in the number of applicants for teacher training in 2009, which can probably be seen in connection with the launching of the GNIST campaign (see below). Pay stands out as the most important reason why young people do not choose teacher training. The pay in the five countries is at about the same starting level, but although teacher's pay is not any higher in Finland than in the other countries, the status associated with being a teacher there is sufficient that the vocation is still regarded as attractive (Nordic Council of Ministers 2010).

GNIST – partnership for a coherent and comprehensive effort for teachers is a broad effort to improve the quality of teacher training and to further develop the teaching profession. The partnership works to increase the status of teachers and to recruit more good teachers for the future. (http://www.gnistweb.no/).

A survey that was conducted in connection with the GNIST effort indicates that teacher training programmes and the teaching profession are headed in the right direction. Data from the *Universities and Colleges Admission Service* in 2009 show that there was an increase at that time in the applications for general teacher training with nearly 20 per cent more qualified applicants than in 2008. If we compare a GNIST survey with an equivalent survey from the year before, young people who are headed for higher education in 2009 respond that they think the teaching profession is both less boring and more important. The teaching profession is regarded as more attractive than it was a year ago, both by those who are planning to get a higher education and in the society in general. The survey indicates that men in particular have a more positive opinion of the teaching profession. This is in accordance with the number of applicants in 2009, where the biggest increase came among male applicants.

Those who answered that they think the teaching profession has increasing status were also asked why they think that this is the case. One of the responses to that question, is that the media have focused more attention on the teaching profession and that people thereby realise that teachers must have competence and schooling (MediaCom/TNS 2010).

Improvement of the role of the teacher

Report no. 11 (2008-2009) to the Storting Læreren. Rollen og utdanningen (The teacher. *Role and Training)* (Ministry of Education and Research 2008–2009) launches a new teacher training programme with new content and a new structure. Greater specialisation has been planned with regard to both the subject and the Year. The general teacher training that we have at present will thereby be modified to a new primary and lower secondary education and training with two main programmes, one for Years 1-7 and one for Years 5-10.

In addition to the Report to the Storting's presentation of a new teacher training programme, it also mentions how guidance and follow-up of newly qualified teachers can help make the teachers better equipped for their job in the classroom. The transition from education to employment entails many challenges for newly qualified teachers. Many of them find it challenging to have responsibility for the pupil's learning and for leading pupils through the school day. The newly qualified teachers are often motivated and ambitious. However, they do not have as large a repertoire based on former teaching experience on which to base their choices. It is necessary to provide systematic guidance and follow-up to the teachers in their first years of employment. This is important so that the new teachers shall develop good competence and master their profession (Frøseth et al. 2008).

A research summary that was written by UNESCO indicates that we must regard the first year of the teaching profession as a learning year and an extension of the education (Cooper and Alvaredo 2006). Many teachers quit in one of their first years because they feel that they are unable to master the teaching profession. American research shows that a mentoring and introduction programme, especially one that involves collegial support, reduces the number of newly qualified teachers who quit the profession (Guarino et al. 2006). This is also a measure that can help meet the increasing demand for teachers in the coming years. The UNESCO report points out that the guidance must focus on pedagogical strategies that promote the pupils' learning, not just short-term problem solving. Time must be set aside for both the mentor and the participants to plan and to observe how the others in the group teach, and incentives ought to be found that make it easier to recruit capable mentors.

The first effort to provide guidance to newly qualified teachers came with a pilot project in 1998. Various models for the follow-up of newly qualified teachers were tested. The efforts were expanded, and in 2003 the Norwegian Directorate for Education and Training established the scheme *Rettleiing av nyutdanna lærarar* (Guidance of newly qualified teachers). SINTEF (The Foundation for Scientific and Industrial Research at the Norwegian Institute of Technology) evaluated the testing of the scheme in 2006 (Dahl et al. 2006). In the evaluation, it is noted that two out of three of the teachers who participated in the project were very satisfied or satisfied with the guidance. Therefore, an offer of further training in guidance for mentors has been established in all of the teacher training regions in Norway. This training shall help the mentors to support the professional development and training of the newly qualified teachers.

An agreement between the Ministry of Education and Research and the Norwegian Association of Local Authorities (KS) (5 February 2009) establishes that starting in the autumn of 2010 all newly qualified teachers shall be offered a mentor, an experienced and qualified colleague who shall help facilitate the professional development and training of newly qualified teachers. Starting in the autumn of 2011, this will also apply to pre-school teachers.

6.5 Competence development for teachers

Kompetanse for utvikling. Strategi for kompetanseutvikling i grunnopplæringen 2005–2008 (Competence for development. Strategy for competence development in primary and secondary education and training 2005-2008) (The Norwegian Directorate for Education and Training 2005) was a major central government effort to promote competence development related to the introduction of the Knowledge Promotion Reform. The experience gained from this effort emphasises that competence development for teachers and instructors must be long-term and predictable and have a good organisational framework (Hagen et al. 2009).

On the basis of various surveys of teachers' competence and amendments to the competence regulations (Aamodt et al. 2007 and Lagerstrøm 2007), it is desirable to put more emphasis on further education that gives ECTS credits. The competence development strategy has the objective of improving the learning and motivation of the pupils by increasing the academic, subject didactic and pedagogical competence of the teachers.

Continuing education in vocational education and training

The competence improvement strategy does not encompass instructors and technical managers, but the central government will strengthen the improvement of competence for these groups with other measures. Materials have been developed that are meant for use in the continuing education of vocational teachers, technical managers and instructors in training establishments and examination boards and appeals boards for craft and journeyman's examinations. The continuing education materials are a composite of booklets on specialised topics, booklets for course leaders, educational films, trigger films, memory cards, audio files and links to relevant resources.
The materials are accessible at http://www.skolenettet.no/yrkesfag.

There were 1,328 teachers who accepted the offer of further education in the 2009-2010 school year. There are great differences in the degree of participation in different subjects. The highest level of participation is in the programmes in reading, counselling and mathematics. The lowest level of participation was in the programmes in Sami and in practical-aesthetic subjects (The Norwegian Directorate for Education and Training 2009c).

In connection with the competence development strategy, a close collaboration was developed between the university and university college institutions and the school owners. Through the project *Utvikling av samarbeidsformer mellom lærerutdanning og skole-/barnehageeier* (Development of forms of cooperation between teacher training and school and/or kindergartner owner), this cooperation has been improved (The Norwegian Directorate for Education and Training 2009c).

For several years, the central government has transferred funds to school owners for continuing education in areas that are given national priority. These funds come in addition to the investment in further education. Continuing education is education that does not give formal qualifications through ECTS credits, but involves measures such as brief courses, seminars, participation in development work and colleague-based guidance.

Another central government programme is the scheme with a *Corps of Advisors*, which was established in the autumn of 2009. The scheme is not aimed directly at teachers, but at schools and school owners that face special challenges and need guidance in order to get started improving the teaching processes in the school. The scheme is discussed in greater detail in the chapter *Some glimpses into the Education Mirror*. Cf. http://www.udir.no/Artikler/Veilederkorps-for-skoleutvikling/ as well.

6.6 National Training Programme for Head Teachers

School leadership has a strong, albeit indirect, influence on the pupils' results (cf. for example Waters et al. 2003, Leithwood et al. 2006 and National College 2007).

The national training programme for head teachers started up in the autumn of 2009. The programme is an education and training programme for all newly hired head teachers and head teachers who do not have formal management qualifications. It shall be controlled and targeted, have a practical aim and be based on the real needs of head teachers and other school leaders. A national standard for good school leadership has been developed, which is incorporated in five areas of competence (The Norwegian Directorate for Education and Training 2008):

- The pupils' learning outcomes and learning environment
- Management and administration
- Cooperation and organisational development, supervision of teachers
- Development and change
- The relationship to the role of leader

For each of these areas of competence, expectations of and requirements to the individual head teacher have been formulated with regard to *knowledge* (what the head teacher should know, be aware of and understand), skills (what the head teacher should be able to do and master) and *attitudes* (what the head teacher should stand for, identify with, be committed to and signal) (The Norwegian Directorate for Education and Training 2008).

An extension of the programme is planned to other target groups beside head teachers; i.e. other school leaders. In that case, there shall also be a focus on the leadership capacity of the school owner, e.g. through clearer accountability, better organisation and competence building.

There are limits on the inherent effect that education has on the behaviour and performance of leaders. General leadership research shows that other forms of learning are more effective when the goal is better leadership (Mintzberg 2004). Therefore, the management training ought to be improved through other measures that can supplement the head teacher training and that are closely integrated into the context and the challenges of the individual leader. The most important training arena is the job of the leader itself. Leaders who are learning their job prefer *mentoring, coaching*, training, reflection and discussions with others in similar situations and in similar roles. In order to achieve this kind of training, the competence and capacity must be considerably upgraded in a dialogue with the institutions that offer management training.

Over a slightly longer period of time, there will be a need to broaden the definition of the role of the head teacher through clearer responsibility, a greater emphasis on academic leadership and the development of the school as an organisation. The role of the head teacher can also be strengthened a great deal by seeing that a better support system is developed for head teachers (cf. the scheme involving the corps of advisors). The intention is that these measures shall help facilitate better recruitment both to teaching positions and school leader positions.

An extensive evaluation of the national training programme for head teachers shall be conducted starting in the autumn of 2010 and lasting for a period of four years.

References

Author/publisher	Year	Title	Published
Allerup, Peter, Velibor Kovac, Gro Kvåle, Gjert Langfeldt and Poul Skov	2009	Evaluering av det Nasjonale kvalitetsvurderingssystemet for grunnopplæringen. (Evaluation of the national quality assessment system for primary and secondary education and training.) FoU-rapport nr. (R&D report no.) 8/2009	Agderforskning, Kristiansand, Norway
Bakken, Anders	2010	Prestasjonsforskjeller i Kunnskapsløftets første år - kjønn, minoritetsstatus og foreldres utdanning. (Disparities in Performance in the First Year of the Knowledge Promotion Reform - Gender, Minority Status and Parents' Education). Report 9/2010	Norwegian Social Research (NOVA), Oslo, Norway
Berliner, D.C.	2001	Learning About and Learning From Expert Teachers. In *International Journal of Educational Research*	Pittsburgh, Pennsylvania, USA
Bonesrønning, Hans and Jon Marius Vaag Iversen	2010	Prestasjonsforskjeller mellom skoler og kommuner: Analyse av nasjonale prøver 2008. (Differences in achievement among schools and municipalities: Analysis of national tests 2008. Report no.) 01/10	The Centre for Economic Research at NTNU (SØF), Trondheim, Norway
Bonesrønning, Hans, Lars-Erik Borge, Marianne Haraldsvik and Bjarne Strøm	2008	Ressurser og resultater i grunnopplæringen: Forprosjekt. (Resources and results in primary and lower secondary education and training: Preliminary project.) Report no. 4/08	The Centre for Economic Research at NTNU (SØF), Trondheim, Norway
Borge, Lars-Erik, Ole Henning Nyhus, Bjarne Strøm and Per Tovmo	2009	Ressurser og tidsbruk i grunnskolen i Norge og andre land. (Resources and the way time is spent in primary and lower secondary school in Norway and other countries.) Report 02/09	The Centre for Economic Research at NTNU (SØF), Trondheim, Norway
Borge, Lars-Erik and Linn Rene Naper	2006	Ressursbruk i grunnopplæringen. (Resources in primary and lower secondary education and training: Preliminary project.) Report no. 4/08	The Centre for Economic Research at NTNU (SØF), Trondheim, Norway
Bratsberg, Bernt, Oddbjørn Raaum, Knut Røed and Hege Marie Gjefsen	2010	Utdannings- og arbeidskarrierer hos unge voksne: Hvor havner ungdom som slutter skolen i ung alder? (Educational and vocational careers for young adults. Where do young people who quit school at an early age end up?)	The Ragnar Frisch Centre for Economic Research, Oslo, Norway
Byrhagen, Karen N., Torberg Falch and Bjarne Strøm	2006	Frafall i videregående opplæring: Betydningen av grunnskolekarakterer, studieretningar og fylke (Drop-out in upper secondary education and training: the importance of primary and lower secondary school marks, areas of study and county)	The Centre for Economic Research at NTNU (SØF), Trondheim, Norway
Cooper, J and A. Alvaredo	2006	Preparation, recruitment and retention of teachers	UNESCO, Paris, France
Dahl, Thomas, Håkon Finne, Trond Buland and Vidar Havn	2006	Hjelp til praksisspranget (Assistance in the transition from school to employment)	SINTEF Technology and Society, Trondheim, Norway
Dale, Erling Lars and Jarl Inge Wærness	2006	Vurdering og læring i en elevaktiv skole (Assessment and learning in a school where the pupils are active)	Universitetsforlaget, Oslo, Norway

Author/publisher	Year	Title	Published
Danielsen, Inger-Johanne, Einar M. Skaalvik, Per E. Garmannslund and Tor Egil Viblemo	2009	Elevene svarer! Analyse av Elevundersøkelsen 2009 (The pupils respond! Analysis of the Pupil Survey 2009)	Oxford Research, Kristiansand, Norway
Desimone, L. M.	2009	Improving Impact Studies of Professional Development: Toward Better Conceptualizations and Measures. In *Educational Researcher 38 (3)*	Washington, DC, USA
Daal, Victor van, Ragnar Gees Solheim, Nina Nøttaasen Gabrielsen and Anne Charlotte Begum	2007	Norske elevers leseinnsats og leseferdigheter. Resultater fra fjerde og femte trinn i den internasjonale studien PIRLS 2006 (Norwegian pupils' reading efforts and reading skills. Results from Years four and five in the international study PIRLS 2006)	The Reading Centre, The University of Stavanger
Falch, Torberg and Ole Henning Nyhus	2009	Frafall fra videregående opplæring og arbeidsmarkeds-tilknytning for unge voksne. (Drop-out from upper secondary education and training and the labour market status of young adults.) Report 07/09	The Centre for Economic Research at NTNU (SØF), Trondheim, Norway
Falch, Torberg and Per Tovmo	2007	Ressurssituasjonen i grunnopplæringen. (The resource situation in primary and secondary education and training.) Report 01/07.	The Centre for Economic Research at NTNU (SØF), Trondheim, Norway
Falch, Torberg, Anne Borge Johannesen and Bjarne Strøm	2010	Kostnader av frafall i videregående opplæring (Costs of drop-out in upper secondary education and training)	The Centre for Economic Research at NTNU (SØF), Trondheim, Norway
Falch, Torberg, Päivi Lujala, Ole Henning Nyhus and Bjarne Strøm	2010b	Årsaker til og konsekvenser av manglende fullføring av videregående opplæring (Causes and consequences of failure to complete upper secondary education and training)	The Centre for Economic Research at NTNU (SØF), Trondheim, Norway
Farrington, David P. and Maria M. Ttofi	2009	School-Based Programs to Reduce Bullying and Victimization	Campbell Collaboration
Frøseth, Mari Wigum	2008	Tre år etter videregående opplæring: Kartlegging av overgangen til videre utdanning og arbeidsliv blant personer som avsluttet videregående opplæring i Østfold våren 2003 (Three years after upper secondary education and training: Survey of the transition to further education and employment among persons who completed upper secondary education and training in Østfold County in the spring of 2003)	NIFU STEP, Oslo, Norway
Frøseth, Mari Wigum, Elisabeth Hovdhaugen, Håkon Høst and Nils Vibe		Tilbudsstruktur og gjennomføring i videregående opplæring (Structure of programmes and completion in upper secondary education and training)	NIFU STEP, Oslo, Norway
Grøgaard, Jens B.	2010	Tabeller og figurer til Utdanningsspeilet, del 3. Analyser av grunnskolens avgangselever (10. trinn) våren 2009. Notat til første rapport fra prosjektet "Ressursbruk og læringsresultater i grunnopplæringen". (Tables and figures in The Education Mirror, part 3. Analyses of graduating pupils from lower secondary school [Year 10] in the spring of 2009. Memo to the first report from the project, "Spending and learning outcomes in primary and secondary education and training"). Unpublished	NIFU STEP, Oslo, Norway

Author/publisher	Year	Title	Published
Grøgaard, Jens B., Håvard Helland and Jon Lauglo	2008	Elevenes læringsutbytte: Hvor stor betydning har skolen? En analyse av ulikhet i elevers prestasjonsnivå i fjerde, syvende og tiende trinn i grunnskolen og i grunnkurset i videregående. (The pupils' learning outcomes: how important is school? An analysis of inequality in pupils' achievement level in Years four, seven and ten in primary and lower secondary school and in the first Year of upper secondary school.) Report 45/2008	NIFU STEP, Oslo, Norway
Grønmo, Liv Sissel and Torgeir Onstad, eds.	2009	TIMSS 2007. Tegn til bedring? Norske elevers prestasjoner i matematikk og naturfag (TIMSS 2007. Signs of improvement? Norwegian pupils' performance in mathematics and the natural sciences)	Unipub, Oslo, Norway
Grønmo, Liv Sissel, Ole Kristian Bergem, Marit Kjærnsli, Svein Lie and Are Turmo	2004	Hva i all verden har skjedd i realfagene? Norske elevers prestasjoner i matematikk og naturfag i TIMSS 2003. (What in the world has happened in the natural sciences? Norwegian pupils' performance in mathematics and the natural sciences in TIMSS 2003.) Acta Didactica 5/2004	Department of Teacher Education and School Development at the University of Oslo, Oslo, Norway
Grønmo, Liv Sissel, Torgeir Onstad & Ida Friestad Pedersen	2010	Matematikk i motvind. TIMSS Advanced 2008 i videregående skole (Uphill struggle for mathematics. TIMSS Advanced 2008 in upper secondary school)	Unipub, Oslo, Norway
Grønmo, Liv Sissel, Torgeir Onstad, Ida Friestad Pedersen, Svein Lie, Carl Angell and Anubha Rohatgi	2009 2007-2008	Matematikk og fysikk i videregående skole. Et skritt tilbake - Kortrapport om hovedresultater fra TIMSS Advanced (Mathematics and physics in upper secondary school. A step in the wrong direction - Short report on the main results from TIMSS Advanced)	Department of Teacher Education and School Development at the University of Oslo, Oslo, Norway
Guarino, Cassandra, Lucrecia Santibañez and Glenn A. D.	2006 2008-2009	Teacher Recruitment and Retention: A Review of the Recent Empirical Literature. in *Review* and *International Journal of Educational Research*, 76 (2)	Pittsburgh, Pennsylvania, USA
Hagen, Anna, Torgeir Nyen and Dagfinn Hertzberg	2006	Evaluering av Kompetanse for utvikling. Strategi for kompetanseutvikling i grunnopplæringen 2005-2008. Delrapport 1 (Strategy for development of competence in primary and secondary education and training 2005-2008. Sub-report 1)	Institute of Applied Social Science (FAFO), Oslo, Norway
Hagen, Anna, Torgeir Nyen and Dagfinn Hertzberg	2008	Evaluering av Kompetanse for utvikling. Strategi for kompetanseutvikling i grunnopplæringen 2005-2008. Delrapport 3 (Evaluation of competence for development. Strategy for development of competence in primary and secondary education and training 2005-2008. Sub-report 3)	Institute of Applied Social Science (FAFO), Oslo, Norway
Hagen, Anna and Torgeir Nyen	2009	Kompetanse for hvem? Sluttrapport fra evalueringen av Kompetanse for utvikling. Strategi for kompetanseutvikling i grunnopplæringen 2005-2008. (Competence for whom? Final report of the evaluation of competence for development. Strategy for development of competence in primary and secondary education and training 2005-2008.)	Institute of Applied Social Science (FAFO), Oslo, Norway
Hattie, John A. C.	2009	Visible Learning. A synthesis of over 800 meta-analyses relating to achievement	Routledge, New York, USA

Author/publisher	Year	Title	Published
Haugsbakken, Halvdan and Siri Mordal	2009	Rapportering fra kvalitative studier i kartleggingen av tidsbruk og organisering i grunnskolen (Reporting from qualitatives studies in the survey of time spent and organisation in primary and lower secondary school)	SINTEF (The Foundation for Scientific and Industrial Research at the Norwegian Institute of Technology), Trondheim, Norway
Helland, Håvard and Liv Anne Støren	2004	Videregående opplæring – progresjon, gjennomføring og tilgang til læreplasser. Forskjeller etter studieretning, fylke og kjønn og mellom elever med minoritets- og majoritets-bakgrunn (Upper secondary education and training - progression, completion and access to apprenticeships. Differences by area of study, county and gender and between pupils with a minority or majority background)	NIFU STEP, Oslo, Norway
Hægeland, Torbjørn, Lars J. Kirkebøen, Oddbjørn Raaum and Kjell G. Salvanes	2005	Skolebidragsindikatorer. Bregnet for avgangskarakterer fra grunnskolen for skoleårene 2002-2003 og 2003-2004. (School performance indicators. Based on diplomas from lower secondary schools in 2002-2003 and 2003-2004) Reports 2005/33	Statistics Norway, Oslo, Norway
Hægeland, Torbjørn, Lars J. Kirkebøen and Oddbjørn Raaum	2009	Ressurser i grunnskole og videregående opplæring i Norge 2003–2008. (Resources in primary and lower secondary school and upper secondary education and training in Norway 2003-2008.) Report 2/2009	The Ragnar Frisch Centre for Economic Research, Oslo, Norway
Høst, Håkon and Miriam Evensen	2009	Ny struktur - tradisjonelle mønstre? Om Kunnskapsløftets strukturendringer i det videregående opplæringssystemet, og utforming av tilbud og dimensjonering i fylkeskommunene (New structure - traditional patterns? The Knowledge Promotion Reform's structural changes in the upper secondary education and training system and the design of programmes and dimensioning in the county administrations)	NIFU STEP, Oslo, Norway
Haahr, Jens Henrik, Thomas Kibak Nielsen, Martin Eggert Hansen and Søren Teglgaard Jakobsen	2005	Explaining Student Performance. Evidence from the international PISA, TIMSS and PIRLS surveys. http://ec.europa.eu/education/pdf/doc282_en.pdf	Danish Technological Institute, Copenhagen, Denmark
Kjærnsli, Marit, Svein Lie, Rolf Vegar Olsen and Astrid Roe	2007	Tid for tunge løft. Norske elevers kompetanse i naturfag, lesing og matematikk i PISA 2006. (Time for a big improvement. Norwegian pupils' competence in the natural sciences, reading and mathematics in PISA 2006.)	Universitetsforlaget, Oslo, Norway
Kjærnsli, Marit, Svein Lie, Rolf Vegar Olsen, Astrid Roe and Are Turmo	2004	Rett spor eller ville veier? Norske elevers kompetanse i matematikk, naturfag og lesing i PISA 2003. (On the right track or way wrong. Norwegian pupils' performance in mathematics, the natural sciences, and reading in PISA 2003.)	Universitetsforlaget, Oslo, Norway
The Ministry of Education and Research	2007-2008	Report no. 31 (2007-2008) to the Storting Kvalitet i skolen (Quality in the Schools)	Oslo, Norway

Author/publisher	Year	Title	Published
The Ministry of Education and Research	2010	Realfag for framtida. Strategi for styrking av realfag og teknologi 2010-2014 (Natural sciences for the future. Strategy for improvement of the natural sciences and technology 2010-2014)	Oslo, Norway
The Ministry of Education and Research	2008-2009	Report no. 11 (2008-2009) to the Storting Læreren - rollen og utdanningen (The Teacher - Role and Education)	Oslo, Norway
The Ministry of Education and Research and the Norwegian Association of Local Authorities (KS)	2009	Avtale mellom Kunnskapsdepartementet og KS om veiledning av nytilsatte nyutdannede pedagoger i barnehagen og skolen, datert 05.02.09 (Agreement between the Ministry of Education and Research and KS on guidance for newly hired, newly qualified teachers in the kindergartens and schools, dated 5 February 2009)	Oslo, Norway
Lagerstrøm, Bengt Oscar	2007	Kompetanse i grunnskolen. Hovedresultater 2005–2006 (Competence in primary and lower secondary school. Main results 2005-2006)	Statistics Norway, Oslo – Kongsvinger, Norway
Larsen, K.A. and A. Hompland	1999	Trender i arbeidslivet (Trends in employment)	ECON, Oslo, Norway
Leithwood, Louis, Seashore, Anderson and Wahlström	2004	How Leadership Influences Student Learning	New York, New York, USA
Lie, Svein, Carl Angell and Anubha Rohatgi	2010	Fysikk i fritt fall? TIMSS Advanced 2008 i videregående skole (Physics in free fall? TIMSS Advanced 2008 in upper secondary school)	Unipub, Oslo, Norway
Markussen, Eifred, Berit Lødding, Nina Sandberg and Nils Vibe	2006	Forskjell på folk – hva gjør skolen? (Differences among people - what is the school doing about it?) Report 3/2006	NIFU STEP, Oslo, Norway
MediaCom/TNS Gallup	2010	Læreryrkets status i Norge (The teaching profession's status in Norway)	Oslo, Norway
Mintzberg, Henry	2004	Managers not MBAs	San Fransisco, California, USA
Mullis, Ina V.S., Michael O. Martin, David F. Robitaille and Pierre Foy	2009	TIMSS Advanced 2008. International report. Findings from IEA's Study of Achievement in Advanced Matematics and Physics in the Final Year of Secondary School	IEA, Boston College, Boston, Massachusetts, USA
National College	2007	What We Know About School Leadership	Nottingham/London, UK
Nordenbo, Sven Erik, Michael Søgaard Larsen, Neriman Tifticki, Rikke Eline Wendt and Susan Østergaard	2008	Lærerkompetanse og elevers læring i førskole og skole - Et systematisk review (Teacher competence and pupils' learning in pre-school and school - A systematic review)	Danish Clearinghouse for Educational Research at Århus University, Århus, Denmark
Nordic Council of Ministers	2010	Rekrutteringsproblematikken på de nordiske læreruddannelser. (The recruitment problem in Nordic teacher training.) Tema Nord. Report 2010:533	Copenhagen, Denmark

Author/publisher	Year	Title	Published
Official Norwegian Report (NOU) 2008: 18	2008	Fagopplæring for framtida (Vocational education for the future)	Oslo, Norway
Næss, Terje	2010	Tabeller og figurer til Utdanningsspeilet, del 2. Analyser av Nasjonale prøver for 5. og 8. trinn årene 2007, 2008 og 2009. Notat til første rapport fra prosjektet Ressursbruk og læringsresultater i grunnopplæringen. (Tables and figures in The Education Mirror, part 2. Analyses of national tests for Years 5 and 8 in the years 2007, 2008 and 2009. Memo to the first report from the project, "Spending and learning outcomes in primary and secondary education and training"). Unpublished	NIFU STEP, Oslo, Norway
OECD	2008	Improving School Leadership	OECD, Paris, France
OECD	2009a	Education at a Glance. Volumes 1 and 2.	OECD, Paris, France
OECD	2009b	Creative Effective Teaching and Learning Environments. First results from TALIS	OECD, Paris, France
Opheim, Vibeke	2010	Tabeller og figurer til Utdanningsspeilet, del 1. Analyser av Nasjonale prøver for 5. og 8. trinn årene 2007, 2008 og 2009. Notat til første rapport fra prosjektet Ressursbruk og læringsresultater i grunnopplæringen. (Tables and figures in The Education Mirror, part 1. Analyses of national tests for Years 5 and 8 in the years 2007, 2008 and 2009. Memo to the first report from the project, "Spending and learning outcomes in primary and secondary education and training"). Unpublished.	NIFU STEP, Oslo, Norway
Opheim, Vibeke	2009	Kostnader ved frafall: Hva betyr frafall i videregående opplæring for inntekt blant ulike grupper yrkesaktiv ungdom? (Costs of drop-out: What effect does drop-out from upper secondary education and training have on income among various groups of gainfully employed young people?) In *Søkelys på arbeidslivet. (a scientific journal with a focus on research on employment).*	Institute for Social Research, Oslo, Norway
Prøitz, Tine Sophie and Jorunn Spord Borgen	2010	Rettferdig standpunktvurdering - det (u)muliges kunst? Læreres setting av standpunktkarakter i fem fag i grunnopplæringen. (Fair overall achievement marks - the art of the (im)possible? Teachers' determination of overall achievement marks in five subjects in primary and secondary education and training.) Report 16/2010	NIFU STEP, Oslo, Norway
Ravlo, Grethe, Ole Harald Johansen, Olav Dalsegg Tokle, Tor Andersen and Bård Vinje	2010	Nasjonal prøve i regning 8. trinn 2009 (National test in mathematics, Year 8, 2009)	Norwegian Centre for Mathematics Education (NSMO)/Norwegian University of Science and Technology (NTNU), Trondheim, Norway

Author/publisher	Year	Title	Published
Rønning, Marthe	2010	Homework and pupil achievement in Norway. Evidence from TIMSS. Reports 1/2010	Statistics Norway, Oslo – Kongsvinger, Norway
Raaum, Oddbjørn, Jon Rogstad, Knut Røed and Lars Westlie	2009	Young and out: An application of a prospects-based concept of social exclusion. In *The Journal of Socio-Economics*	The Journal of Socio-Economics
Skolverket (The Swedish Education System)	2009	Vad påverkar resultaten i svensk grunnskola? (What factors affect the results in Swedish primary and lower secondary school?)	Skolverket, Stockholm, Sweden
Skaar, Karl, Tor Egil Viblemo and Einar M. Skaalvik	2008	Se den enkelte. Analyse av Elevundersøkelsen 2008 (See the individual. Analysis of the Pupil Survey 2008)	Oxford Research, Kristiansand, Norway
Statistics Norway	2010b	Folkemengde etter alder, kjønn, sivilstand og statsborgerskap, 2010. (Population by age, gender, marital status and nationality, 2010.) http://www.ssb.no/folkemengde/tab-2010-03-11-34.html	Oslo - Kongsvinger, Norway
Statistics Norway	2008	Innvandring og innvandrere 2008 (Immigration and immigrants 2008)	Oslo - Kongsvinger, Norway
Statistics Norway	2010a	Videregående opplæring og annen videregående utdanning, 2009. (Upper secondary education and training and other upper secondary education, 2009.) http://www.ssb.no/emner/04/02/30/vgu/	Oslo - Kongsvinger, Norway
Statistics Norway	2006	Nye definisjoner av utdanningsnivåer: (New definitions of levels of education:) http://www.ssbw.no/vis/magasinet/slik_lever_vi/	Oslo - Kongsvinger, Norway
Strøm, Bjarne, Lars-Erik Borge and Halvdan Haugsbakken	2009	Tidsbruk og organisering i grunnskolen: (Time spent and organisation in primary and lower secondary school:) Report 04/09	The Centre for Economic Research at NTNU (SØF), Trondheim, Norway
Støren, Liv Anne	2008	Høyere utdanning og arbeidsmarked – i Norge og Europa. Norsk rapportering fra EU-prosjektet REFLEX. (Higher education and the labour market – in Norway and Europe. Norwegian reporting from the EU project, REFLEX.) Report 6	NIFU STEP, Oslo, Norway
Turmo, Are and Svein Lie	2006	Vurdering av naturfagkompetanse på PC - Norske resultater fra generalprøven i PISA CBAS. (Computer-based assessment of science - Norwegian results from the general test in PISA CBAS (Programme for International Student Assessment. Computer-based Assessment of Science). NORDINA, 2(4):3-15	University of Oslo, Oslo, Norway, NTNU (Norwegian University of Science and Technology), Trondheim, Norway, University of Gothenburg, Gothenburg, Sweden
The Norwegian Directorate for Education and Training	2005	Competence for development. Strategi for kompetanse-utvikling i grunnopplæringen 2005-2008. (Competence for whom? Final report of the evaluation of Competence for development. Strategy for development of competence in primary and secondary education and training 2005-2008.)	Oslo, Norway

Author/publisher	Year	Title	Published
The Norwegian Directorate for Education and Training	2006	Forebyggende innsatser i skolen (Preventive efforts in the school system)	Oslo, Norway
The Norwegian Directorate for Education and Training	2008	Kompetanse for en rektor – forventninger og krav. Vedlegg 2 til Konkurranse om nasjonalt utdanningstilbud for rektorer (Qualifications for a head teacher – expectations and requirements. Appendix 2 to Competition on national education programmes for head teachers.)	Oslo, Norway
The Norwegian Directorate for Education and Training	2009a	Analyser - karakterstatistikk for grunnskolen 2009. (Analyses - marks statistics for primary and lower secondary school 2009.) http://www.udir.no/upload/Statistikk/AnalysekaraktererGS09.pdf	Oslo, Norway
The Norwegian Directorate for Education and Training	2009b	Rundskriv Udir-08-2009 Kunnskapsløftet - om fag- og timefordeling for grunnopplæringen og tilbudsstrukturen i videregående opplæring. (Circular Udir-08-2009 The Knowledge Promotion Reform - the distribution of subjects and class periods for primary and secondary education and training and the structure of programmes in upper secondary education and training.) http://www.udir.no/upload/Rundskriv/2009/udir-8-2009_Kunnskapsloftet.pdf	Oslo, Norway
The Norwegian Directorate for Education and Training	2009c	Årsrapport 2009 (Annual Report 2009)	Oslo, Norway
The Norwegian Directorate for Education and Training	2009d	Karakterstatistikk for videregående opplæring skoleåret 2008-2009. (Marks statistics for upper secondary education and training in the 2008-2009 school year.) http://www.udir.no/upload/Statistikk/Karakterer/Karakterstatistikk_vgo_09_analyse.pdf	Oslo, Norway
The Norwegian Directorate for Education and Training	2009e	Spesialundervisning - veileder til opplæringsloven om spesialpedagogisk hjelp og spesialundervisning (Special needs education - guide to the Education Act concerning special education assistance and special needs education)	Oslo, Norway
The Norwegian Directorate for Education and Training	2010	Sammendrag av analyserapporter nasjonale prøver. (Summary of analytical reports on national tests.) http://www.udir.no/upload/Rapporter/nasjonale_prover/Oppsummering_rapporter_np_2009.pdf	Oslo, Norway
Vibe, Nils and Miriam Evensen	2009	Spørsmål til Skole-Norge høsten 2009. Resultater og analyser fra Utdanningsdirektoratets spørreundersøkelse blant skoler og skoleeiere (Questions for the Norwegian school system in the autumn of 2009. Results and analyses from the Norwegian Directorate for Education and Training's survey of schools and school owners)	NIFU STEP, Oslo, Norway

Author/publisher	Year	Title	Published
Vibe, Nils, Miriam Evensen and Elisabeth Hovdhaugen	2009	Spørsmål til Skole-Norge. Tabellrapport fra Utdanningsdirektoratets spørreundersøkelse blant skoler og skoleeiere våren 2009 (Questions for the Norwegian school system. Table report from the Norwegian Directorate for Education and Training's survey of schools and school owners in the spring of 2009)	NIFU STEP, Oslo, Norway
Vibe, Nils, Per Olaf Aamodt and Tone Cecilie Carlsten	2009	Å være ungdomsskolelærer i Norge. Resultater fra OECDs internasjonale studie av undervisning og læring (TALIS). (Being a lower secondary school teacher in Norway. Results from the OECD's Teaching and Learning International Survey [TALIS]). Report no. 23/09	NIFU STEP, Oslo, Norway
Vox	2006	Basis! Voksnes læring 2006 – tilstand, utfordringer, anbefalinger (Adult learning in 2006 - status, challenges, recommendations)	Oslo, Norway
Waters, Tim, Robert J. Marzano and Brian McNulty	2003	Balanced Leadership: What 30 years of research tells us about the effect of leadership on student achievement	Denver, Colorado, USA
Aamodt, Per Olaf and Are Turmo	2007	Faglig og pedagogisk kompetanse blant lærere i videregående skole. (Academic and teaching qualifications of teachers in upper secondary school.) Report 29/07.	NIFU STEP, Oslo, Norway

Figures and tables

1 Facts about primary and secondary education and training

Figures:

Tables:

2 Resources

Figures:

3 Learning outcomes

Figures:

Tables:

4 The learning environment

Figures:

Tables:

5 Recruitment, completion and competence achievement in upper secondary education and training

Figures:

Tables:

6 Quality improvement

Figures:

Supplementary tables

Supplementary table 1.1 to figure 1.1: Distribution of small, medium-sized and large mainstream primary and lower secondary schools, 1997-1998 to 2009-2010. Per cent.

	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010
Less than 100 pupils	40	38	38	37	36	36	35	35	36	35	34	33	32
100-299 pupils	42	42	41	41	41	40	40	39	39	40	39	40	41
300 pupils or more	19	20	21	22	23	24	25	26	26	26	26	27	27

Source: The Primary and Lower Secondary School Information System (GSI)

Supplementary table 1.2 to figure 1.2: Distribution of pupils in small, medium-sized and large mainstream primary and lower secondary schools, 1997-1998 to 2009-2010. Per cent.

	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010
Less than 100 pupils	11	10	10	10	9	9	9	9	9	8	8	8	8
100-299 pupils	46	46	44	43	42	41	39	38	38	39	38	38	38
300 pupils or more	43	44	46	48	49	50	52	53	53	53	54	54	54

Source: The Primary and Lower Secondary School Information System (GSI)

Supplementary table 1.3 to figure 1.3: School closings in the period from 2007-2008 to 2009-2010. By county. Number.

	Number of school closings
Nordland	22
Møre og Romsdal	17
Oppland	14
Hedmark	13
Hordaland	13
Telemark	12
Sogn og Fjordane	11
Troms	11
Finnmark	10
Rogaland	7
Buskerud	5
Vestfold	4
Sør-Trøndelag	4
Østfold	3
Vest-Agder	3
Akershus	2
Nord-Trøndelag	2
Oslo	0
Aust-Agder	0

Source: The Norwegian Directorate for Education and Training

Supplementary table 1.4 to figure 1.4: Pupils who were affected by school closings in the period from 2007-2008 to 2009-2010.. By county. Number.

	Number of pupils
Oppland	815
Telemark	689
Hedmark	660
Vest-Agder	487
Møre og Romsdal	479
Troms	469
Østfold	402
Hordaland	380
Nordland	278
Rogaland	255
Finnmark	248
Akershus	216
Sogn og Fjordane	215
Vestfold	197
Buskerud	165
Sør-Trøndelag	84
Nord-Trøndelag	4
Oslo	0
Aust-Agder	0

Source: The Norwegian Directorate for Education and Training

Supplementary table 1.5 to figure 1.5: Breakdown by where pupils were transferred after a school closing in the period from 2007-2008 to 2009-2010. Per cent.

New public schools	New private schools	Merged schools/transferred to existing school
1383	172	3 066

Source: The Norwegian Directorate for Education and Training

Supplementary table 1.6 to figure 1.6: Adult education institutions, 2003-2004 to 2009-2010. Number.

Year	Number of adult education institutions
2003-2004	262
2004-2005	255
2005-2006	252
2006-2007	242
2007-2008	241
2008-2009	256
2009-2010	249

Source: The Primary and Lower Secondary School Information System (GSI)

Supplementary table 1.7 to figure 1.7: Trend in the number of pupils in the period from 1997-1998 to 2009-2010 for mainstream primary and lower secondary schools. Mainstream primary and lower secondary schools. Number.

	Mainstream primary and lower secondary school	Primary school	Lower secondary school
1997-1998	55 8247	40 1640	15 5112
1998-1999	56 8666	41 1500	15 5387
1999-2000	58 0261	41 9805	15 8279
2000-2001	59 0471	42 6475	16 2040
2001-2002	59 9468	42 9445	16 8095
2002-2003	61 0297	43 2618	17 5121
2003-2004	61 7577	43 2345	18 1934
2004-2005	61 8250	42 9652	18 5866
2005-2006	61 9640	42 9207	18 7856
2006-2007	61 9038	43 0737	18 8301
2007-2008	61 6388	42 8650	18 7537
2008-2009	61 4033	42 5756	18 8262
2009-2010	61 3928	42 3194	19 0711

Source: The Primary and Lower Secondary School Information System (GSI)

Supplementary table 1.8 to figure 1.8: Apprentices and new apprentices by gender. 2003 to 2009. Number. Revised data.

	Men	Women
2003-2004	19 931	8 559
2004-2005	20 365	8 654
2005-2006	22 343	8 973
2006-2007	25 097	9 342
2007-2008	27 566	9 656
2008-2009	27 935	10 233
2009-2010	25 469	10 542

Source: Statistics Norway

Supplementary table 1.9 to figure 1.9: Pupils with individual decisions on special needs education by Year and gender in the period 2006-2007 to 2009-2010. Mainstream primary and lower secondary schools. Per cent.

School year	1 Year 1	2.Year 2	3. Year 3	4. Year 4	5. Year 5	6. Year 6	7. Year 7	8. Year 8	9. Year 9	10. Year 10
2009-2010	3.9	4.5	5.4	6.6	7.8	8.7	9.1	9.6	10.1	10.1
2008-2009	3.8	4.2	4.8	6.0	7.1	7.7	8.4	9.1	9.0	9.7
2007-2008	3.3	3.7	4.4	5.2	6.1	7.0	7.6	8.2	8.7	8.9
2006-2007	3.0	3.4	3.9	4.8	5.7	6.6	7.2	7.9	8.0	8.3

Source: The Primary and Lower Secondary School Information System (GSI)

Supplementary table 1.10 to figure 1.10: Percentage of pupils in mainstream primary and lower secondary school with Bokmål or Nynorsk as first-choice form of Norwegian or Sami or some other language as a first language, by county 2009-2010. Per cent.

	Bokmål	Nynorsk	Sami	Other
The whole country	86.4	13.2	0.2	0.2
Østfold	100.0	0.0	0.0	0.0
Akershus	99.4	0.0	0.0	0.6
Oslo	98.8	0.0	0.0	1.2
Hedmark	100.0	0.0	0.0	0.0
Oppland	80.5	19.5	0.0	0.0
Buskerud	97.1	2.9	0.0	0.0
Vestfold	100.0	0.0	0.0	0.0
Telemark	87.5	12.0	0.0	0.6
Aust-Agder	93.4	6.0	0.0	0.6
Vest-Agder	96.6	3.4	0.0	0.0
Rogaland	75.1	24.9	0.0	0.0
Hordaland	59.6	40.2	0.0	0.2
Sogn og Fjordane	2.8	97.2	0.0	0.0
Møre og Romsdal	46.7	53.3	0.0	0.0
Sør-Trøndelag	99.9	0.1	0.0	0.0
Nord-Trøndelag	99.8	0.2	0.0	0.0
Nordland	99.9	0.0	0.1	0.0
Troms	99.5	0.1	0.3	0.0
Finnmark	91.7	0.0	8.2	0.1

Source: The Primary and Lower Secondary School Information System (GSI)

Supplementary table 1.11 to figure 1.11: Highest level of education in the population of OECD countries in the 25-64 age group. 2007. Per cent.

	University or university college	Upper secondary school	Lower than upper secondary school
Canada	49	38	13
New Zealand	41	30	29
Japan	41	59	..
USA	40	48	12
Finland	36	44	20
Norway	34	44	21
South Korea	34	43	23
Australia	34	34	32
Denmark	33	43	25
Belgium	33	36	32
UK	32	37	32
Switzerland	32	55	13
Sweden	32	53	16
Ireland	32	36	32
Netherlands	31	42	27
Iceland	30	34	36
Spain	29	22	49
Luxembourg	27	40	34
France	27	42	31
Germany	24	60	16
Greece	22	37	40
Poland	19	68	14
Hungary	17	61	20
Austria	17	62	19
Mexico	15	18	67
Slovakia	14	73	13
Portugal	14	14	72
Italy	14	38	48
Czech Republic	14	76	9
Turkey	11	18	71
OECD average	27	44	30

Source: OECD 2009a

Supplementary table 1.12 to figure 1.12: Age distribution of teachers and leaders in primary and lower secondary school, fourth quarter 2008. Number.

Age	Number
age 23 and under	1193
age 24	668
age 25	961
age 26	1 208
age 27	1 279
age 28	1 354
age 29	1 451
age 30	1 561
age 31	1 671
age 32	1 819
age 33	1 988
age 34	2 222
age 35	2 299
age 36	2 395
age 37	2 311
age 38	2 208
age 39	2 226
age 40	2 054
age 41	1 869
age 42	1 659
age 43	1 524
age 44	1 445
age 45	1 395
age 46	1 351
age 47	1 456
age 48	1 588
age 49	1 619
age 50	1 662
age 51	1 601
age 52	1 741
age 53	1 811
age 54	1 936
age 55	1 990
age 56	2 002
age 57	1 988
age 58	1 897
age 59	1 829
age 60	1 803
age 61	1 819
age 62	1 498
age 63	1 088
age 64	868
age 65	455
age 66	307
age 67	154
age 68	109
age 69	73
age 70 and over	137

Source: Statistics Norway

Supplementary table 1.13 to figure 1.13: Age distribution of teachers and leaders in upper secondary education and training. Fourth quarter 2008. Number.

Age	Number
age 23 and under	78
age 24	67
age 25	114
age 26	154
age 27	224
age 28	267
age 29	342
age 30	367
age 31	352
age 32	416
age 33	439
age 34	532
age 35	598
age 36	587
age 37	684
age 38	624
age 39	685
age 40	651
age 41	677
age 42	714
age 43	682
age 44	675
age 45	697
age 46	668
age 47	678
age 48	683
age 49	744
age 50	735
age 51	766
age 52	849
age 53	885
age 54	906
age 55	1 073
age 56	1 047
age 57	977
age 58	981
age 59	1 005
age 60	1 021
age 61	998
age 62	827
age 63	678
age 64	514
age 65	310
age 66	217
age 67	130
age 68	71
age 69	62
age 70 and over	90

Source: Statistics Norway

Supplementary table 2.1 to figure 2.1: Expenditure per pupil in primary and lower secondary school broken down by payroll and operations. 2007-2009, group figures. NOK.

Year	Total	Payroll	Fixtures and equip-ment	Teaching materials	School premises and trans-portation
2007	82 826	63 259	999	1 968	16 600
2008	83 698	64 486	753	1 867	16 592
2009 (preliminary figures)	83 532	65 890	736	1 493	15 413

Source: KOSTRA, group figures

Supplementary table 2.2 to figure 2.2: Distribution of municipalities by adjusted gross operating expenses and operating expenses adjusted for cost structure for 2009. NOK 1000.

	Adjusted gross operating expenses	Structurally adjusted operating expenses
50-55	0	0
55-60	1	3
60-65	3	4
65-70	7	9
70-75	17	47
75-80	40	62
80-85	41	89
85-90	60	75
90-95	48	53
95-100	41	28
100-105	27	11
105-110	19	4
110-115	17	4
115-120	18	1
120-125	11	0
125-130	8	0
130-135	5	0
135-140	8	0
140-145	7	0
145-150	2	0
150-155	3	0
155-160	1	0
160-165	2	0
165-175	2	0
175-180	1	0
180-185	1	0

Source: KOSTRA, group figures

Supplementary table 2.3 to figure 2.3: Expenditure per pupil in general studies and vocational education programmes broken down by payroll and operations 2007-2009.

	Total	Payroll	Opera-tions	Total	Payroll	Opera-tions
2007	98089	59501	38588	134 489	83 255	51 234
2008	98727	61203	37525	135 702	84 416	51 286
2009 preliminary figures	100489	63538	36951	136346	85281	51065

Source: KOSTRA, group figures

Supplementary table 2.4 to figure 2.4: Changes in expenditure per pupil broken down into general studies and vocational education programmes. 2008-2009. NOK 1000.

	General studies		
	2008	2009	diff 2009-2008
Østfold	95 101	105 589	10 488
Akershus	84 500	94 436	9 936
Oslo	90 122	78 162	-11 960
Hedmark	95 496	108 306	12 810
Oppland	96 169	103 327	7 157
Buskerud	89 154	99 435	10 281
Vestfold	88 052	95 033	6 981
Telemark	97 266	100 503	3 237
Aust-Agder	98 081	106 557	8 476
Vest-Agder	91 912	93 337	1 425
Rogaland	94 338	100 852	6 514
Hordaland	94 609	105 563	10 954
Sogn og Fjordane	110 991	122 661	11 670
Møre og Romsdal	96 889	100 189	3 300
Sør-Trøndelag	94 443	98 442	3 999
Nord-Trøndelag	115 121	121 414	6 293
Nordland	100 355	109 716	9 360
Troms	115 476	118 238	2 761
Finnmark	122 840	128 126	5 286

	Vocational		
	2008	2009	diff 2009-2008
Østfold	130 640	140 268	9 628
Akershus	137 161	151 507	14 346
Oslo	168 677	138 704	-29 973
Hedmark	122 908	138 878	15 971
Oppland	114 097	120 327	6 230
Buskerud	126 698	139 011	12 312
Vestfold	127 509	135 566	8 057
Telemark	116 188	124 370	8 181
Aust-Agder	123 164	132 887	9 723
Vest-Agder	123 160	119 368	-3 792
Rogaland	124 282	135 515	11 233
Hordaland	133 517	142 000	8 482
Sogn og Fjordane	136 513	158 411	21 899
Møre og Romsdal	124 516	122 874	-1 642
Sør-Trøndelag	121 177	122 827	1 650
Nord-Trøndelag	141 613	147 267	5 654
Nordland	129 566	131 541	1 975
Troms	140 267	148 122	7 855
Finnmark	126 372	135 771	9 398

Source: KOSTRA, group figures

Supplementary table 2.5 to figure 2.5: Group size 1 for the various levels of education. 2003-2004 to 2009-2010.

Year	Group size 1, Years 1-4	Group size 1, Years 5-7	Group size 1, Years 8-10	Group size 1, Years 1-10	Group size 2, Years 1-10
2003-04	13.1	13.4	15.0	13.8	16.7
2004-05	13.3	13.4	15.0	13.9	16.7
2005-06	13.5	13.5	15.1	14.0	17.0
2006-07	13.3	13.5	15.0	13.9	16.9
2007-08	13.1	13.4	14.8	13.8	16.8
2008-09	13.2	13.3	14.7	13.7	16.8
2009-10	13.0	13.1	14.7	13.6	16.7

Source: The Primary and Lower Secondary School Information System (GSI)

Supplementary table 2.6 to figure 2.6: Distribution of municipalities by group size 1 for Years 1-10 2005-2006 to 2009-2010.

Group size 1

	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010
4-6	1	0	1	0	2
6-8	9	18	16	24	27
8-10	55	57	70	62	70
10-12	119	121	118	125	122
12-14	134	138	134	132	126
14-16	90	74	74	71	71
16-18	20	23	18	16	13
18-20	3	0	0	1	0

Source: The Primary and Lower Secondary School Information System (GSI)

Supplementary table 2.7 to figure 2.8: Number of pupils per form teacher 2003-2004 to 2009-2010.

Name	Year	Years 1-4	Years 5-7	Years 8-10
The whole country	2003-2004	17.4	17.7	17.0
	2004-2005	15.8	15.7	14.9
	2005-2006	15.8	15.7	14.7
	2006-2007	15.8	15.8	14.6
	2007-2008	15.6	15.6	14.6
	2008-2009	15.8	15.7	14.8
	2009-2010	16.1	16.0	15.1

Source: The Primary and Lower Secondary School Information System (GSI)

Supplementary table 2.8 to figure 2.9: Distribution of municipalities by pupils per form teacher. Years 1-10. 2005-2006 to 2009-2010.

	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010
7-10	23	19	21	27	26
10-13	132	129	133	131	115
13-16	183	178	188	179	165
16-19	78	74	60	73	83
19-22	12	14	14	19	22
22>	2	3	3	2	3

Source: The Primary and Lower Secondary School Information System (GSI)

Supplementary table 2.9 to figure 2.10: Teachers who do not have an approved degree for the Year that they teach. 2003-2004 to 2009-2010. Per cent.

Name	Year	Years 1-4	Years 5-7	Years 8-10
The whole country	2003-2004	3.44	2.86	2.63
	2004-2005	2.84	2.43	1.93
	2005-2006	2.5	2.04	1.77
	2006-2007	2.54	2.26	2.13
	2007-2008	2.85	2.86	2.52
	2008-2009	3.9	3.64	3.22
	2009-2010	4.26	4.08	3.81

Source: The Primary and Lower Secondary School Information System (GSI)

Supplementary table 2.10 to figure 2.11: Distribution of municipalities by number of teachers who do not have an approved degree for the Year that they teach. 2005-2006 to 2009-2010. Per cent.

	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010
0-5	390	373	354	304	284
5-10	30	46	56	85	86
10-15	5	8	13	29	35
15-20	6	2	4	7	16
20-25	0	2	1	2	6
25>	0	0	3	4	4

Source: The Primary and Lower Secondary School Information System (GSI)

Supplementary table 2.11 to figure 2.12: Trend in calculated full-time equivalents (FTEs) for teaching and calculated FTEs for total teaching staff. 2003-2004 to 2009-2010. Number.

Name	Year	Calculated FTES for teaching	Calculated FTEs for total teaching staff
The whole country	2003-2004	46113	51 365
	2004-2005	46755	51 765
	2005-2006	46931	52 028
	2006-2007	47290	53 496
	2007-2008	47792	54 032
	2008-2009	48785	55 115
	2009-2010	49209	56 075

Source: The Primary and Lower Secondary School Information System (GSI)

Supplementary table 2.12 to figure 2.13: FTEs performed by other staff as a percentage of total teaching FTEs. 2005-2006 to 2009-2010. Per cent.

Year	Assistants	Leaders and Educational Supervisors	Office tech staff	ICT staff
2005-2006	11.2	8.4	3.6	
2006-2007	11.9	8.5	3.5	
2007-2008	13.3	8.7	3.5	
2008-2009	13.8	8.9	3.5	0.5
2009-2010	14.5	8.9	3.5	0.5

Source: The Primary and Lower Secondary School Information System (GSI)

Supplementary table 2.13 to figure 2.14: Distribution of municipalities by percentage of FTEs performed by assistants relative to FTEs performed by the teaching staff. 2005-2010.

	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010
0-5	34	29	23	22	20
5-10	146	127	109	105	78
10-15	177	175	172	160	168
15-20	57	78	92	101	127
20-25	11	12	29	35	32
25>	5	8	5	7	6

Source: The Primary and Lower Secondary School Information System (GSI)

Supplementary table 2.14 to figure 2.15: Teaching hours for special needs education (SNE) as a percentage of total teaching hours, by year. 2003-2004 to 2009-2010. Per cent.

Year	Years 1-4	Years 5-7	Years 8-10
2003-2004	10.3	15.1	16.3
2004-2005	10.2	14.6	16.2
2005-2006	10.4	14.4	16.6
2006-2007	10.9	14.9	17.1
2007-2008	11.8	15.7	17.9
2008-2009	12.1	16.8	18.7
2009-2010	12.2	17.6	19.4

Source: The Primary and Lower Secondary School Information System (GSI)

Supplementary table 2.15 to figure 2.16: Decision on special needs education with a teacher broken down by number of hours. 2009-2010.

	1-75 hours	76-90 hours	191-270 hours	More than 270 hours
2009/2010	7	48	19	26

Source: The Primary and Lower Secondary School Information System (GSI)

Supplementary table 2.16 to figure 2.17: Distribution of municipalities by percentage of teaching hours for special needs education (SNE). 2005-2006 to 2009-2010.

	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010
0-5	11	5	6	2	4
5-10	59	54	43	39	29
10-15	183	180	149	134	119
15-20	137	131	146	151	154
20-25	34	49	69	81	90
25-30	6	10	11	18	25
30>	1	2	7	6	9

Source: The Primary and Lower Secondary School Information System (GSI)

Supplementary table 2.17 to figure 2.18: Teaching hours for adapted education in Norwegian for language minorities and percentage of pupils with adapted education in Norwegian by individual decision. 2003-2004 to 2009-2010. Per cent.

Name	Year	Percentage of pupils with adapted education in Norwegian	Percentage of teaching hours for adapted education in Norwegian
The whole country	2003-2004	5.7	4.4
	2004-2005	5.8	4.5
	2005-2006	6.0	4.5
	2006-2007	6.5	4.5
	2007-2008	6.5	4.2
	2008-2009	6.7	4.1
	2009-2010	6.8	4.0

Source: The Primary and Lower Secondary School Information System (GSI)

Supplementary table 2.18 to figure 2.19: Extra teaching hours per pupil and total extra teaching hours per pupil. 2003-2004 to 2009-2010. Number. Selection: limited to schools with average number of pupils per Year >12. All Years.

Year	Extra teaching hours per pupil	Extra teaching hours per pupil	N
2003-2004	7.3	18.3	386
2004-2005	7.3	18.3	386
2005-2006	6.7	17.8	390
2006-2007	6.4	18.0	386
2007-2008	6.9	18.9	386
2008-2009	6.7	19.4	385
2009-2010	6.7	19.6	383

Source: The Primary and Lower Secondary School Information System (GSI)

Supplementary table 2.19 to figure 2.20: Expenditure per pupil in the OECD countries in 2006. Adjusted for the general price and cost level in each country. USD.

	Years 1-7	Years 8-10	Upper secondary school
Luxembourg	13 676	18 144	18 144
United States	9 709	10 369	11 334
Norway	9 486	10 075	12 559
Iceland	9 299	8 910	8 196
Denmark	8 798	8 909	10 400
Switzerland	8 793	10 121	16 540
Austria	8 516	10 011	11 205
United Kingdom	7 732	8 868	8 693
Italy	7 716	8 527	8 474
Sweden	7 699	8 365	8 610
Japan	6 989	8 004	8 589
Netherlands	6 425	9 149	9 918
Ireland	6 337	8 964	9 024
Australia	6 311	8 319	9 315
Finland	5 899	9 241	6 585
France	5 482	8 265	10 655
Germany	5 362	6 632	9 163
Portugal	5 138	6 677	7 052
New Zealand	4 952	5 347	6 838
Korea	4 935	5 719	9 060
Hungary	4 599	4 161	3 793
Poland	3 770	3 315	3 498
Slovak Republic	3 221	2 841	3 081
Czech Republic	3 217	5 399	5 217
Mexico	2 003	1 814	2 856
OECD average	6 437	7 544	8 486

Source: OECD 2009a

Supplementary table 2.20 to figure 2.21: Pupils per teacher in OECD countries. Calculated on the basis of full-time equivalents. 2007. Number.

	Years 1-7	Years 8-10	Upper secondary school
Mexico	28.0	33.3	25.7
Korea	25.6	20.5	16.2
France	19.7	14.3	9.6
United Kingdom	19.4	16.7	11.3
Japan	19.0	14.8	12.5
Czech Republic	18.7	12.3	12.3
Germany	18.3	15.2	14.3
Slovak Republic	17.9	13.9	14.1
New Zealand	17.5	16.2	13.3
Finland	15.0	9.9	15.9
Switzerland	14.8	12.3	10.6
United States	14.6	14.7	15.6
Spain	13.6	11.7	7.7
Austria	13.6	10.3	11.0
Belgium	12.6	9.2	10.2
Sweden	12.3	11.5	13.6
Portugal	11.8	7.9	8.4
Poland	11.0	12.4	12.2
Norway	11.0	10.2	9.8
Italy	10.5	9.4	10.8
Hungary	10.2	10.2	12.1
Greece	10.1	7.7	7.3
OECD average	16.0	13.2	12.5

Source: OECD 2009a

Supplementary table 2.21 to figure 2.22: Expenditures on education and total public expenditures. 2003 to 2009. Percentage of GDP.

	2003	2004	2005	2006	2007	2008	2009
Percentage of total public expenditures that goes to pre-school and Years 1-7	3.4	3.3	3.2	3.1	3.0	3.0	3.2
Percentage of total public expenditures that goes to Years 8-13	1.8	1.9	1.6	1.5	1.5	1.5	1.6
Percentage of total public expenditures that goes to other education	3.0	2.8	2.8	2.7	2.6	2.7	2.8
Percentage of GDP for mainland Norway that goes to pre-school and Years 1-7	5.7	5.6	5.6	5.6	5.6	5.4	5.4
Percentage of GDP for mainland Norway that goes to Years 8-13	3.0	3.2	2.8	2.8	2.8	2.7	2.7
Percentage of GDP for mainland Norway that goes to other education	5.0	4.8	5.0	4.9	4.8	4.8	4.7

Source: OECD 2009

Supplementary table 3.1 to figure 3.1: Results in mathematics on the national tests for Year 8 in 2009, by county. Percentages in the five mastering levels.

County	Level 1	Level 2	Level 3	Level 4	Level 5
Oslo	4.4	14.4	37.6	24.9	18.7
Akershus	5.3	16.9	40.0	22.5	15.3
Sogn og Fjordane	4.7	16.3	42.5	21.5	15.1
Rogaland	5.6	18.4	41.5	21.2	13.3
Sør-Trøndelag	7.1	20.4	40.5	20.3	11.7
Hordaland	6.5	20.8	41.7	20.1	10.9
Møre og Romsdal	6.1	20.1	43.5	19.6	10.8
Troms	7.2	22.1	40.8	18.8	11.1
Oppland	6.8	23.0	40.7	18.4	11.0
Vest-Agder	6.8	21.1	43.3	19.1	9.7
Buskerud	7.4	22.6	41.2	18.1	10.6
Aust-Agder	6.9	22.9	41.8	19.5	8.9
Vestfold	8.4	22.3	41.0	18.7	9.6
Nord-Trøndelag	7.0	23.4	41.8	17.7	10.0
Hedmark	7.8	22.8	42.2	18.2	9.0
Finnmark	7.0	24.4	42.8	17.7	8.1
Telemark	7.0	24.4	43.0	17.1	8.6
Østfold	7.9	24.0	42.7	16.8	8.6
Nordland	7.5	23.7	44.0	16.6	8.3

Source: Statistics Norway's StatBank Norway

Supplementary table 3.2 to figure 3.2: Achievement levels in English, mathematics and reading by immigrant background. Overall results on the national tests for Year 5 in 2007, 2008 and 2009. Standardised scores.

Test	Immigrants from non-western countries	Immigrants from western countries	Descendents from non-western countries	Descendents from western countries
English	-2.8	1.7	0.1	4.0
Mathematics	-6.6	0.5	-3.5	1.8
Reading	-7.0	-1.6	-4.8	1.6

Source: Opheim 2010

Supplementary table 3.3 to figure 3.3: Achievement levels in English, mathematics and reading by immigrant background. Overall results on the national tests for Year 8 in 2007, 2008 and 2009. Standardised scores.

Test	Immigrants from non-western countries	Immigrants from western countries	Descendents from non-western countries	Descendents from western countries
English	-5.9	-0.1	-1.2	4.1
Mathematics	-7.0	0.4	-2.9	2.1
Reading	-10.1	-2.9	-5.6	1.6

Source: Opheim 2010

Supplementary table 3.4 to figure 3.4: Achievement levels in English, mathematics and reading by the parents' level of education. Overall results on the national tests for Year 8 in 2007, 2008 and 2009. Standardised scores.

The parents' level of education	English	Mathematics	Reading
Primary and lower secondary school	45.3	44.0	43.7
Upper secondary school, lower secondary education	46.8	46.3	46.7
Upper secondary school, completed	48.2	48.1	48.2
Supplementary year to upper secondary education	49.7	49.7	49.9
University or college degree. undergraduate level	52.2	52.5	52.7
University or college degree. graduate level	55.3	56.1	55.9
Post-graduate level	57.7	58.2	57.9

Source: Næss 2010

Supplementary table 3.5 to figure 3.6: Distribution of examination marks in the first-choice form of Norwegian, written examination in Year 10 in the 2008-2009 school year. Boys and girls.

Marks	Boys	Girls
1	1.3	0.4
2	23.1	9.9
3	41.1	36.2
4	25.3	35.3
5	8.3	16.2
6	0.9	2.0

Source: The Norwegian Directorate for Education and Training/VIGO

Supplementary table 3.6 to figure 3.7: Examination marks in selected subjects in Year 10 in 2009 by the parents' highest level of education. Average.

The parents highest education	Mathematics written	First-choice form of Norwegian, written	English, written	Norwegian, oral	Religion+	French, German and Spanish, oral
Unknown/primary school	2.7	2.6	3.1	3.7	3.9	4.4
Lower secondary school	2.6	2.9	3.1	3.7	3.7	3.6
Upper secondary school, lower secondary education	2.9	3.1	3.5	4.1	4.0	3.7
Upper secondary school, completed	3.1	3.2	3.6	4.2	4.1	3.9
Supplementary year to upper secondary education	3.4	3.4	3.8	4.4	4.4	3.8
University or college degree. undergraduate level	3.8	3.6	4.0	4.7	4.7	4.3
University or college degree. graduate level	4.3	3.9	4.4	5.0	5.0	4.6
Post-graduate level	4.5	3.9	4.6	5.2	5.1	4.8

Source: Grøgaard 2010

Supplementary table 3.7 to figure 3.14: Apprentices who have taken the craft or journeyman's examination broken down by whether they passed or failed in the period from 2001 to 2009. Number.

Year	Number who passed	Number who failed
2001	19 340	1477
2002	18 584	1445
2003	17 736	1429
2004	16 917	1384
2005	17 185	1412
2006	17 146	1269
2007	17 694	1302
2008	19 768	1520
2009	20 585	2089

Source: The Norwegian Directorate for Education and Training/VIGO

Supplementary table 3.8 to figure 3.15: Apprentices who have taken the craft or journeyman's examination broken down by the percentage who failed, passed and passed with distinction in 2009.

County	Failed	Passed	Passed with distinction
Oslo	288	1075	224
Hordaland	272	2062	386
Sør-Trøndelag	147	1168	242
Nord-Trøndelag	80	583	124
Troms	74	625	147
Finnmark	30	243	63
Akershus	122	1069	302
Vest-Agder	68	792	223
Sogn og Fjordane	32	428	120
Buskerud	91	666	214
Oppland	80	595	192
Aust-Agder	43	365	117
Rogaland	257	1799	593
Møre og Romsdal	93	1112	363
Østfold	106	683	239
Telemark	66	592	225
Vestfold	65	655	250
Hedmark	56	559	233
Nordland	119	801	454

Source: The Norwegian Directorate for Education and Training/VIGO

Supplementary table 3.9 to figure 3.17: Average achievement score in mathematics for the countries that took part in TIMSS Advanced 2008, by the percentage of the age cohort who have chosen advanced mathematics (coverage index).

	Russian Federation	Netherlands	Lebanon	Iran, Islamic Rep. of	Slovenia	Italy	Norway	Armenia	Sweden	Philippines		TIMSS Advanced scaled average
Percentage of age cohort	1.4	3.5	5.9	6.5	40.5	19.7	10.9	4.3	12.8	0.7	0	50
Mathematics score	561	552	545	497	457	449	439	433	412	355	500	500

Source: Mullis et al. 2009

Supplementary table 3.10 to figure 3.18: The distribution of pupils by competence level in mathematics in TIMSS Advanced 2008. Percentage of the whole age cohort.

	Advanced level	High level	Intermediate level	Low level
Slovenia	1.2	4.5	10.9	23.9
Italy	0.6	2.2	5.3	11.6
Sweden	0.1	1.0	2.6	9.1
Norway	0.1	0.9	2.8	7.1
Netherlands	0.2	1.6	1.5	0.2

Source: Grønmo et al. 2010

Supplementary table 3.11 to figure 3.19: Change in mathematics scores for pupils in the last Year of upper secondary school. The period from 1995 (1998 in Norway) to 2008.

Country	Change
Sweden	-89
Norway	-61
Italy	-34
Slovenia	-20
Russian Federation	12

Source: Grønmo et al. 2010

Supplementary table 3.12 to figure 3.20: Change in achievement in mathematics for Norway for Years 4 and 8 and the last Year of upper secondary school in the TIMSS studies 1995-2008.

	1995	1998	2003	2007	2008
TIMSS, Year 4	476	-	451	473	-
TIMSS, Year 8	498	-	461	469	-
TIMSS Advanced	-	500	-	-	439

Source: Grønmo et al. 2010

Supplementary table 3.13 to figure 3.21: The distribution of pupils by competence level in physics in TIMSS Advanced 2008. Percentage of the whole age cohort.

	Advanced	High	Intermediate	Low
Sweden	0.8	2.5	3.4	4.3
Slovenia	0.9	2.4	2.5	1.7
Russian Federation	0.5	0.6	0.6	0.9
Norway	0.7	2.2	2.4	1.4
Netherlands	0.7	1.8	0.9	0.1
Lebanon	0	0.5	1.6	3.8
Italy	0.1	0.3	0.8	2.6
Iran, Islamic Rep. of	0.6	0.9	1.3	3.8
Armenia	0.4	0.8	1.2	1.8

Source: Lie et al. 2010

Supplementary table 5.1 to figure 5.2: Applicants to general studies and vocational education programmes in Vg1. 2006-2010. Per cent.

	2006	2007	2008	2009	2010
General studies education programme	44.2	45.0	44.5	45.0	46.0
Media and Communication	6.2	6.7	7.4	7.5	7.4
Vocational education programme	49.6	48.2	48.1	47.6	46.6

Sources: The Norwegian Directorate for Education and Training/VIGO 2010

Supplementary table 5.2 to figure 5.4: Achieved competence at the Vg3 level five and six years after pupils began school in general studies and vocational areas of study respectively for the age cohorts 2003 and 2002 (R94). Per cent.

	Completed qualification for higher education	Completed vocational qualifications with diploma	Completed vocational qualifications - achieved craft or journey-man's certificate	Did not achieve qualification for higher educa-tion or vocational qualifications	Still in upper secondary education and training in 2008	Completed Vg3 or took craft examination, failed	Quit under way
General area of studies	81.5	0.4	0.6	17.5	2.1	7.8	7.5
Vocational areas of study	22.3	6.3	31.8	39.6	4.8	7.8	27.0

Source: Statistics Norway 2010

Supplementary table 5.3 to figure 5.5: Applicants as per 1 March 2009, by programme as per 1 October 2009. Per cent.

	Granted primary choice	Granted other than primary choice	Received no offer, registered in the Follow-up service	Received no offer, not regis-tered in the Follow-up service
Vg1	69.6	24.2	3.8	2.4
Vg2	73.1	17.4	5.7	3.8
Vg3	78.6	13.4	3.6	4.4
Apprenticeship	47.0	17.3	14.8	20.8

Sources: The Norwegian Directorate for Education and Training/VIGO 2010

Supplementary table 5.4 to figure 5.7: Percentage of young people reported to the follow-up service as per 1 January 2009, broken down among first-generation immigrants, second-generation immigrants and the rest of the population, by county. Per cent.

County	First-generation immigrants	Second-generation immigrants	The rest of the population
Oslo	19.2	15.5	65.3
Østfold	11.3	1.8	86.9
Vest-Agder	9.9	2.5	87.6
Buskerud	9.7	5.1	85.2
Total	8.3	3.2	88.5
Akershus	8.2	4.0	87.8
Vestfold	8.2	1.4	90.4
Telemark	7.7	1.4	90.9
Sør-Trøndelag	7.3	1.3	91.5
Rogaland	7.2	1.9	90.8
Sogn og Fjordane	6.9	0.3	92.8
Aust-Agder	6.7	0.9	92.4
Nord-Trøndelag	6.2	0.1	93.7
Oppland	5.7	1.0	93.3
Hordaland	5.5	1.3	93.3
Møre og Romsdal	5.1	0.1	94.9
Hedmark	4.6	0.7	94.6
Nordland	4.5	0.3	95.2
Finnmark	4.4	0.2	95.4
Troms	3.6	0.3	96.1

Source: The Norwegian Directorate for Education and Training 2009/Statistics Norway

Supplementary table 5.5 to figure 5.8: Applicants for apprenticeship as per 1 March 2009, by programme as per 1 October 2009, by education programme. Per cent. Non-revised figures.

	Received apprenticeship	Admitted to school	Applied for upper secondary education but offered a programme in the Follow-up service	Not in any programme
Total	54.0	10.3	14.8	20.8
Media and Communication	16.5	40.4	17.4	25.7
Agriculture, Fishing and Forestry	38.6	27.6	11.2	22.5
Service and Transport	46.7	11.2	19.8	22.4
Building and Construction	51.1	8.4	16.9	23.4
Design, Arts and Crafts	51.4	12.1	14.8	21.7
Restaurant and Food Processing	54.3	7.6	17.4	20.7
Technical and Industrial Production	57.3	8.6	15.3	18.6
Electricity and Electronics	57.9	11.5	10.9	19.7
Health and Social Care	59.7	9.2	11.0	20.1

Sources: The Norwegian Directorate for Education and Training

Supplementary table 5.6 to figure 5.9: Achieved competence at the Vg2 level five and six years after pupils began school in general studies and vocational areas of study respectively for the age cohorts 1998-2003 and 1998-2002 (R94). Per cent.

		Completed in stipulated time	Completed in more than the stipulated time	Still in upper secondary education and training	Completed Vg3 or took craft examination, failed	Quit under way
General studies	1998	75.1	8.9	3.0	4.6	8.3
	1999	75.7	8.0	2.7	5.3	8.3
	2000	73.1	8.8	3.3	6.9	7.9
	2001	75.4	7.3	3.2	6.2	7.9
	2002	76.2	6.6	3.0	6.9	7.4
	2003	75.3	7.2	2.1	7.8	7.5
Vocational studies	1998	40.1	22.1	4.4	4.2	29.2
	1999	39.6	21.3	4.9	5.4	28.8
	2000	37.0	22.8	5.7	6.1	28.4
	2001	40.3	20.5	5.6	6.6	27.0
	2002	39.2	21.2	4.8	7.8	27.0

Source: Statistics Norway 2010

Supplementary table 5.7: Status five and six years after commencement of school for pupils in general studies and vocational areas of study respectively for the 2003–2002 age cohort, by county broken down by the percentage who have completed in the stipulated time.

		Completed in stipulated time	Completed in more than the stipulated time	Still in upper secondary education and training	Completed Vg3 or took craft examination, failed	Quit under way
General studies	Total	75.3	7.2	2.1	7.8	7.5
	Finnmark	54.2	15.7	6.2	11.2	12.7
	Troms	70.2	9.5	2.4	11.7	6.1
	Hedmark	70.7	10.0	2.3	8.7	8.3
	Nordland	73.1	8.6	3.1	6.8	8.3
	Vestfold	73.4	6.8	1.7	10.3	7.8
	Sør-Trøndelag	74.4	10.7	2.1	5.5	7.3
	Akershus	74.5	5.8	2.1	8.8	8.8
	Hordaland	75.3	7.7	2.5	7.9	6.6
	Buskerud	75.5	8.8	1.6	9.1	5.0
	Telemark	75.5	5.6	3.0	7.7	8.2
	Rogaland	77.8	6.9	2.1	5.3	7.8
	Møre og Romsdal	78.3	6.4	1.9	7.5	5.9
	Aust-Agder	78.4	5.4	2.3	8.9	5.1
	Nord-Trøndelag	78.7	7.6	2.5	7.8	3.3
	Oslo	79.1	4.7	1.1	7.7	7.4
	Østfold	79.1	6.2	1.1	7.6	6.0
	Oppland	80.7	5.8	1.9	7.3	4.3
	Vest-Agder	82.0	5.4	1.1	6.7	4.9
	Sogn og Fjordane	82.1	6.0	2.1	5.4	4.5
Vocational	Total	39.2	21.2	4.8	7.8	27.0
	Finnmark	22.2	20.8	9.7	6.1	41.1
	Nordland	28.9	22.8	7.9	8.5	31.9
	Troms	31.7	21.0	6.9	8.6	31.7
	Hedmark	34.3	20.0	5.1	10.5	30.2
	Oslo	36.1	19.7	2.9	11.8	29.5
	Vestfold	36.2	20.3	4.8	10.2	28.5
	Østfold	37.5	20.2	3.2	8.1	31.1
	Aust-Agder	37.5	23.7	5.5	6.8	26.5
	Sogn og Fjordane	38.6	24.6	6.7	5.9	24.2
	Møre og Romsdal	40.3	22.5	5.7	5.4	26.2
	Buskerud	40.6	20.7	3.1	9.3	26.3
	Hordaland	41.5	21.1	5.3	8.2	23.8
	Oppland	41.7	20.7	3.7	7.7	26.2
	Telemark	42.2	22.8	5.3	5.0	24.7
	Rogaland	42.7	23.7	4.1	6.7	22.8
	Vest-Agder	43.1	22.0	3.2	5.2	26.5
	Nord-Trøndelag	43.6	20.8	5.8	8.1	21.8
	Akershus	44.2	18.4	3.8	9.8	23.7
	Sør-Trøndelag	44.4	22.3	5.0	4.6	23.7

Source: Statistics Norway 2010

Supplementary table 5.8 to figure 5.10: Pupils and apprentices who have completed and passed upper secondary education and training, by age cohort, number of years since commencing upper secondary education and training and area of study. Per cent.

		Com-pleted in stipulat-ed time	in 5 years	in 6 years	in 7 years	in 8 years	in 9 years	in 10 years	in 11 years	in 12 years	in 13 years	in 14 years
1994 age cohort	General area of studies	73.7	81.9	84.0	85.4	86.5	87.3	87.9	88.4	88.8	89.1	89.4
1998 age cohort	General area of studies	75.0	83.9	85.9	87.2	88.0	88.7	89.2				
2002 age cohort	General area of studies	76.1	82.7	84.7								
1994 age cohort	Vocational area of studies	38.1	50.8	55.8	58.9	60.9	62.3	63.5	64.5	65.3	66.1	66.8
1998 age cohort	Vocational area of studies	39.8	57.0	62.1	64.5	65.9	67.1	68.0				
2002 age cohort	Vocational area of studies	38.9	54.8	60.4								

Source: Statistics Norway 2010

Supplementary table 5.9 to figure 5.11: Pupils and apprentices who have completed and passed upper secondary education and training, by the number of years since vocational education and training commenced. Age cohort and gender. Per cent.

	Com-pleted in stipulated time	Com-pleted in 5 years	Com-pleted in 6 years	Com-pleted in 7 years	Com-pleted in 8 years	Com-pleted in 9 years	Com-pleted in 10 years	Com-pleted in 11 years	Com-pleted in 12 years	Com-pleted in 13 years	Com-pleted in 14 years
1994 age cohort, Men	28.9	41.6	47.9	51.6	54.1	55.8	57.1	58.1	59.0	59.8	60.6
1994 age cohort, Women	50.2	62.9	66.2	68.5	69.8	70.9	72.1	73.0	73.7	74.4	75.0
1998 age cohort, Men	32.9	52.5	58.6	61.3	62.8	63.9	64.9				
1998 age cohort, Women	48.6	62.7	66.6	68.6	69.9	71.1	72.0				
2002 age cohort, Men	30.7	49.8	56.9								
2002 age cohort, Women	49.1	61.1	64.7								

Source: Statistics Norway 2010

Supplementary table 5.10 to figure 5.12: Percentage of the population with at least upper secondary education and training by age group. Per cent.

	age 20-24	age 25-29	age 30-39	age 40-49	age 50-59	age 60-66	age 67 and over
1970	71.1	68.2	57.2	47.9	38.6	33.1	26.6
1980	59.8	74.0	71.9	58.8	49.0	40.9	33.0
1990	69.3	66.8	72.2	73.3	59.8	51.2	40.3
2000	73.1	82.2	75.6	75.9	74.9	62.7	49.1
2008	70.1	80.5	84.6	77.4	80.6	76.0	58.5

Source: Statistics Norway 2010

Supplementary table 5.11 to figure 5.13: Highest achieved competence five and six years after commencement of upper secondary education and training for the age cohorts 2003 and 2002 (R94) by area of study. Percentage.

	Passed Vg3	Quit, passed Vg2	Quit, passed first year	Quit, began first year	Still in upper secondary education and training
General studies	82.5	9.9	2.9	2.6	2.1
Vocational studies	60.4	19.3	9.9	5.7	4.8

Source: Statistics Norway 2010

Supplementary table 6.1 to figure 6.1: Academic and professional development. Course days for teachers in 23 countries. Average.

Mexico	34.0
Korea	30.0
Bulgaria	27.2
Italy	26.6
Poland	26.1
Spain	25.6
Portugal	18.5
Brazil	17.3
Hungary	14.5
Estonia	13.1
Lithuania	11.2
Turkey	11.2
Malaysia	11.0
Iceland	10.7
Austria	10.5
Denmark	9.8
Norway	9.2
Australia	8.7
Slovenia	8.3
Belgium (Flemish)	8.0
Malta	7.3
Slovakia	7.2
Ireland	5.6

Source: Vibe et al. 2009

Supplementary table 6.2 to figure 6.2: When a teacher begins to teach at this school, he/she is given an offer to take part in a formal introductory process. Selected countries.

	Yes, for all new teachers at the school	Yes, but only if it is their first job	No
Belgium (Flemish)	94.4	3.9	1.7
Iceland	72.8	15.7	11.5
Denmark	47.7	23.5	28.8
Austria	32.1	23.6	44.3
Norway	29.9	18.4	51.8
Poland	14.3	79.4	6.3

Source: Vibe et al. 2009

Supplementary table 6.3 to figure 6.3: Confidence in their own teaching (Self-efficacy). All 23 countries.

Norway	0.71
Mexico	0.39
Malaysia	0.35
Italy	0.18
Ireland	0.15
Australia	0.14
Denmark	0.14
Austria	0.08
Bulgaria	0.08
Iceland	0.08
Turkey	0.00
Slovenia	0.00
Malta	-0.01
Belgium (Flemish)	-0.02
Brazil	-0.02
Lithuania	-0.12
Poland	-0.12
Portugal	-0.19
Slovakia	-0.21
Hungary	-0.33
Estonia	-0.37
Spain	-0.42
Korea	-0.45

Source: Vibe et al. 2009

Supplementary table 6.4 to figure 6.4: The percentage of mathematics teachers in TIMSS Advanced who state that they have specialisation in mathematics and mathematics didactics. Five selected countries.

	Mathematics	Mathematics didactics
International avg.	80	55
Sweden	86	67
Slovenia	92	9
Norway	98	6
Netherlands	49	72
Italy	64	*

*No data available for Italy in mathematics didactics
Source: Grønmo et al. 2010

Supplementary table 6.5 to figure 6.5: The mathematics teachers in TIMSS Advanced by age group. Per cent.

	29 or younger	30-39	40-49	50-59	60 or older
Italy	2	10	43	38	8
Netherlands	3	10	20	54	14
Norway	1	8	19	36	36
Slovenia	4	34	32	30	0
Sweden	2	18	22	31	27
International avg.	4	20	29	33	15

Sources: Grønmo et al. 2010

Schweigaardsgate 15 B
P.O. Box 9359 Grønland
N-0135 Oslo
Norway

The Norwegian Directorate for Education and Training