Official Norwegian Reports NOU 2016: 14

# More to gain

Better learning for students with higher learning potential

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## Better learning for students with higher learning potential

Report from the Committee appointed by Royal Decree on 18 September 2015.
Submitted to the Ministry of Education and Research on 15 September 2016.

Translation from Norwegian. For information only.

# To the Ministry of Education and Research

A Committee for high achieving students was appointed by the King in the Council of State on 18 September 2015 to assess the background and facts and propose concrete measures so that more students can perform on higher and more advanced levels in basic education, and that high achieving students have a better school programme. This is the Committee's report.

Oslo, 15 September 2016

Jan Sivert Jøsendal
(Chairperson)

| | | |
|---|---|---|
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# Contents

# Chapter 1
# The Committee's mandate, main findings and recommendations

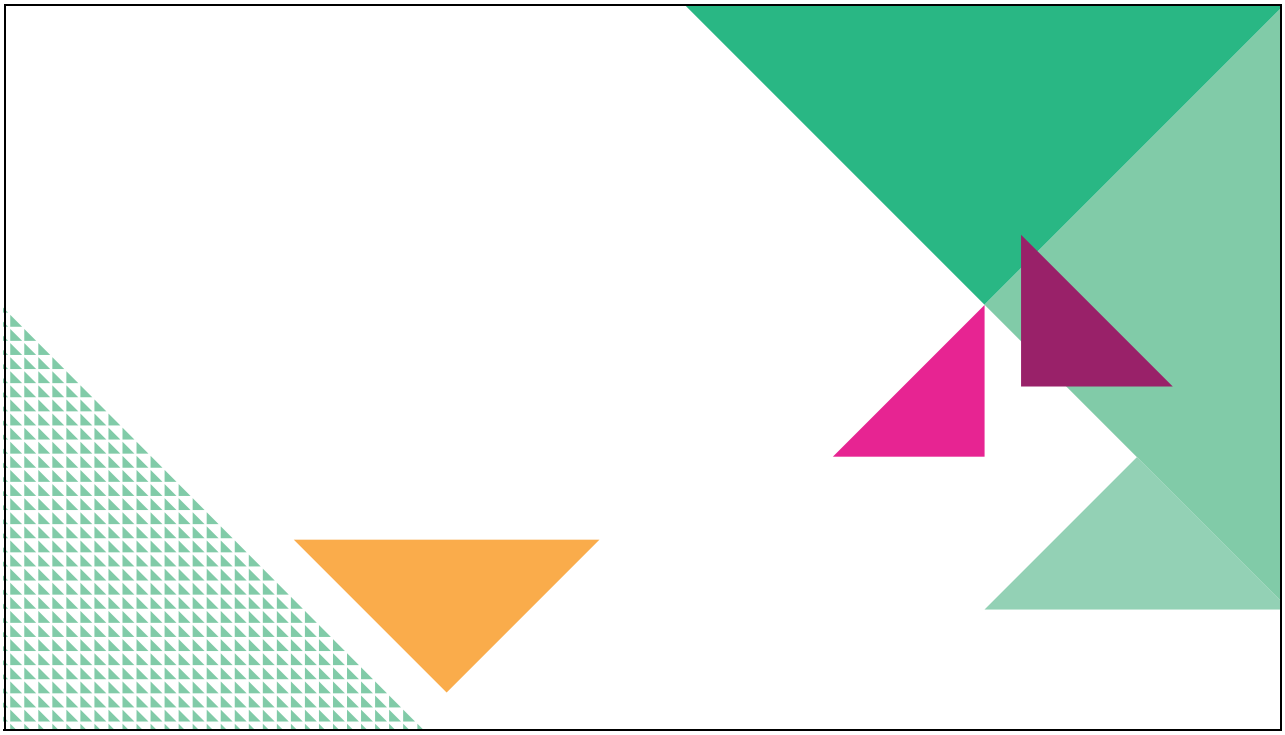

Figure 1.1

Pursuant to a Royal Decree dated 18 September 2015, the Government appointed a Committee for high achieving students. The Committee was given the following mandate:

"Pursuant to section 1-3 of the Education Act, the Norwegian school shall undertake to differentiate instruction to the individual student's abilities and potential. Schools do and must continue to pay attention to students who need extra support in their instruction. However, the obligation to provide individual students with differentiated instruction also applies to high achieving students, students with special talents and students with the potential to achieve on the highest level.

The Committee shall assess the conditions necessary and propose concrete measures that can enable more students to achieve on a high and advanced level in basic education (primary and secondary education and training) and so that high achieving students can have a better school programme of studies. The Committee shall assess and propose recommendations relating to how a varied and differentiated teaching programme for high achieving students can be provided within the regular schooling, and shall also assess special educational measures especially tailored to the group or to individual students. The Committee shall assess organisational, educational, didactic, social, legal and funding aspects.

As the underpinning of the assessments and proposals the Committee must prepare a knowledge base founded on national and international research and experiences from other countries that have a high number of high achieving students.

At least one of the Committee's recommendations must be financially viable within today's funding level.

The Committee shall open for representatives of relevant organisations and expertise environments to submit their points of view, discussion points and input to the Committee.

The Committee shall complete its work within 15 September 2016."

## 1.1 High achieving students

The mandate uses the term *high achieving students*. The Committee has chosen the term *students with higher learning potential*, as this covers the diversity and heterogeneity of this student group, as shown by the report, in a better way. All students have a learning potential, but some students learn more quickly and acquire more complex knowledge compared to their peers.

Students with higher learning potential are not necessarily high achievers, but they have a large potential for learning in one or more subject areas. The category *students with higher learning potential* (10 to 15 per cent of the student population) includes *students with exceptional learning potential* (2 to 5 per cent of the student population). Read more about terms and descriptions of the student group in Chapter 2.6.1.

## 1.2 The Committee's main finding

If the education system had succeeded nationally and locally in providing differentiated instruction for all students, it would have been unnecessary to produce an NOU concentrating on students with higher learning potential. In our committee work we have identified, analysed and assessed what in many ways are overlooked aspects of the education system, which shows that a relatively large proportion of the students experience that the learning environment does not give them the opportunity to realise their higher learning potential. The failure to realise one's abilities may represent a significant loss both for the individual student and society. We risk losing unique competences which first may lead to exceptional achievements in school, and later lead to value creation and social development. Knowledge capital is society's most important resource.

On an overriding level the Committee finds that there are three crucial and systemic acknowledgements that must be focused on if students are to have better learning conditions in primary and secondary education and training:

1. *Primary and secondary education and training does not provide students with higher learning potential the differentiated instruction that would make it possible for them to realise their learning potential.* This acknowledgement should lead to the common will to take action to improve. It should also prompt systematic improvement on the national and local levels which will have consequences for the teacher-student relationship and everyone involved in education.

2. *Schools do not exploit the options they have in relation to educational and organisational differentiation.* This may be due to insufficient understanding of the rules and regulations, different supervisory practices or a limited interpretation of the options available for providing differentiated instruction to students with higher learning potential.

3. *The national and local education system needs a common knowledge base from which to initiate improvement measures in the short and long term.* By formulating a precise picture of the challenges, the ambition of the report is to provide all stakeholders in the Norwegian school with a common knowledge base which will ensure that the students can develop and utilise their potential in an inclusive learning environment.

The knowledge base for this NOU shows that there is a long tradition – also in Norway – for understanding inclusive education as society's special responsibility for taking care of students who are struggling academically and socially. Arguments in favour of providing initiatives for students with higher learning potential have been considered elitist and have also been seen as undermining the equality principle. One commonly held attitude has been that students with high abilities manage on their own.[1]

The research summary[2] which the Norwegian Knowledge Centre for Education has compiled for the Committee shows that as students with higher learning potential are a heterogeneous group, the challenges they may experience also differ widely. Academic and social problems may arise, and these may have major consequences for the students. The research summary points out a number of serious consequences if students are not

[1] Børte et al. 2016, Hofset 1968, Idsøe and Skogen 2011

[2] Entitled "research summary" in this report

understood and treated properly in a school context:

- Non-completion and underachieving
- Social stigmatisation
- Bullying
- Sadness/depression
- Erroneous diagnoses or late identification[3]

An inclusive and differentiated instruction must include *all* students,[4] thus we warn against setting different groups of students and their needs against each other. Different needs must be served by an approach to teaching that allows each child to realise his or her potential for learning, regardless of cognitive capacity. Each student's ability to learn is influenced by effort, work and the relationships the student is a part of, and the learning potential also changes over time, and according to age, motivation and experience. The aim of the education system must be that after 13 years of schooling, all students feel they have been encouraged to have ambitions, been treated with trust and respect and been a part of different learning environments which promote well-being, creativity and the desire to learn[5].

During its work, the Committee has visited schools that are working well with differentiated instruction for students with higher learning potential, but we have also listened to and been told about children and youths who have experienced that school has little understanding of and acceptance for variation in the need to learn. We see that there is room in the basic education to accomplish this, but the education system has not adequately managed to differentiate the instruction for students with higher learning potential.

Knowledge about the needs of the students, their way of learning and competence in differentiating the instruction may create a better school situation for all students. This means that the inclusive comprehensive school, which should ensure that the students feel they belong socially, must accept that differential treatment may be equal treatment, and that concerns about social belonging should not always be answered by having age-homogeneous groups. This acknowledgment should lead to insightful educational and didactic actions on the part of professional teachers and school leaders as they make use of the options at their disposal in their school.

In all cases involving change, painstaking and systematic efforts over time will yield lasting results. However, the time is more than ripe to initiate national and local measures which can give teachers, school leaders and school owners[6] better opportunities to satisfy the needs of students with higher learning potential. All in all, this is about the learning and development of all children and young people. This is about school leadership, learning environments, instruction and professional development – with excellent quality.

On the global scale, Norway is a country which has managed to avoid major social differences in school. Analyses of PISA results show that Norway is doing much better than the average in OECD countries when it comes to ensuring students equal opportunities no matter what their socio-economic background is.[7] These results show that the Norwegian education system has an inherent strength which manages to contribute to social levelling. The education system should thus also have an inherent ability to give students with higher learning potential – from all social strata – better and differentiated instruction.

## 1.3 From acknowledgement to action

The Committee's mandate challenges many aspects of the learning conditions for students with higher learning potential. The Committee has considered and assessed various circumstances that affect the instruction for these students, and it makes clear recommendations in some areas, see Table 1.1. To better understand the challenges and see the responses to the challenges in context, the Committee has chosen to write briefly about this relationship in relation to the structure of the three systemic acknowledgements.

### *1. The need for varied teaching and differentiated instruction for students with higher learning potential*

As formulated in the first systemic acknowledgment, the Committee has found that primary lower and secondary schools are not good enough at providing differentiated instruction for all students, particularly when it comes to students with higher learning potential. Many students are not given instruction and academic challenges that are differentiated to suit their level. The report has shown that there is a complex mix of reasons for

[3] Børte et al. 2016
[4] Section 1-3 of the Education Act.
[5] Cf. section 1 of the Education Act
[6] local school authorities/municipalities/private school owner
[7] OECD 2014

this. One of the main reasons is the lack of knowledge about students with the potential to achieve on higher and advanced levels, and the lack of capacity and competence to change practices in the classroom. This is a challenge the Committee wants the teaching profession and school leaders, school owners and national authorities to address, thus making this a systemic challenge. More knowledge is needed, a change in attitudes is needed and all parties must agree on the need for differentiated instruction. It is also important to have the capacity and strength to actually change and improve the teaching practice.

*2. The need to clarify the difference between available options and the use of these options*

The second systemic acknowledgement refers to the fact that there is a distinction between practised and real use of the options available. Some schools the Committee has been in contact with have exploited the options they have at their disposal in their approach to students with higher learning potential. However, the Committee has found that there is great uncertainty as to how to apply the rules. The reluctance to make use of the available options due to the lack of knowledge and understanding of the rules may create imagined impediments to finding various organisational and pedagogic solutions. Furthermore, misconceptions about students with higher learning potential may be another reason why these students have not received the instruction school is obliged to give them. This refers to the rules governing differentiated instruction, organisation of the students and accelerated schooling.[8] The Committee wants to contribute to clarifying the available options and possibilities under today's rules so that schools can find flexible solutions in the everyday school life. Even when schools have understood their options and used them in the best interests of the students, the Committee has observed that there may still be challenges because the County Governors practise supervision and interpret legislation and the available options in different ways. The Committee finds that it is necessary to arrive at a common interpretation and understanding of the school's options to take action within the rules in force.

*3. The need for a common knowledge base and systematic approach*

The third systemic acknowledgement the Committee has formulated refers to the need for a common national knowledge base to improve differentiated instruction for students with higher learning potential. The Committee believes that a common knowledge base that creates obligations and gives direction to all the stakeholders in the education sector will raise responsibility for resolving challenges to a higher level so that it does not only apply to the individual teacher and the individual school. There is no such common knowledge base today. The Committee has found that little attention is paid to and few plans made for differentiated instruction for students with higher learning potential. Some school owners are in the planning process, but have not come much further. For school owners to succeed in this area, there must be a national focus and clear expectations for school owners as the responsible party for quality in the education. Systematic work toward common goals, where roles and responsibilities have been clarified and the work method is dominated by dialogue, are what we believe will yield sustainable results in the long run.

## 1.4 Categorising the recommendations

Bearing the formulated systemic acknowledgments in mind, the Committee has discussed, assessed and categorised the recommendations according to how much impact the measures could have in terms of the Committee's mandate. A national knowledge base which supports the goal of differentiated instruction for students with higher learning potential must be the foundation on which to build increased competence for all relevant stakeholders. We believe that this will raise the quality of the schooling for all students. The recommendations the Committee chooses to highlight are concrete examples of how we believe that the goal of a good school programme and better results for students with higher learning potential must be built stone by stone as we move towards the realisation of what we have chosen to called an *excellent learning environment*. An excellent learning environment motivates and stimulates all students to learn through high-quality teaching, differentiated instruction and high ambitions.

[8] Section 1-3 first paragraph and section 8-2 of the Education Act, as well as section 1-15 of the Regulations relating to the Education Act


Figure 1.2 Categorising the recommendations

Based on the acknowledgements on the systemic level, the Committee has discussed what must be done for students with higher learning potential. In the mandate, the Committee was challenged to assess six matters: organisational, educational, didactic, social, legal and financial matters. In brief, the Committee defines these as follows:

- *Organisational:* refers to how the instruction is structured, led and organised
- *Educational:* refers to learning, development and teaching
- *Didactic:* refers to teaching methodology within the subjects
- *Social:* refers to the students' social environment and their right to social belonging
- *Legal:* refers to rules the school is obliged to comply with
- *Financial:* refers to funding of operations and development of the school sector

To systematise its work, the Committee has chosen to categorise these six matters into three main groups which point to the system acknowledgements:

- Framing conditions (within which I must work)
- Knowledge, research and experiences (which I must be familiar with and understand)
- Competence and teaching practice (what I must do and develop)

The "I" in this context is all school owners, school leaders and teachers.

This categorisation is not optimal and does not reflect the big picture, nor is that the intention here. For example, legal aspects are also important in the knowledge category, and didactic concerns comprise both knowing about and mastering. The Committee uses the categorisation as a tool in the process of working on the recommendations.

This categorisation is part of the analysis the Committee has undertaken in the extension of the question we asked: Where does the shoe pinch? Where the shoe pinches the most, i.e. where the need for measures is greatest, is also where the greatest effect of the measures may be achieved. We have also assessed the underlying intentions, in other words, what are the success criteria for the measures that focus on where the need is most acute?

All in all, the report, which is based on research, input, study trips, school visits and the Committee's collected experiences, has shown where the most acute need is, which measures will have the greatest effect in solving the challenges presented in the mandate and how the various matters are interconnected.

Within the category *Framing conditions,* the Committee finds that most things are in place. By framing conditions, the Committee means subject curricula, assessment provisions and legal provisions. The report to the Storting [Parliament] 28 (2015–2016) *Fag – Fordypning – Forståelse* [Subjects – In-depth studies – Understanding] recommends that the content of the subject curricula, assessment schemes and the quality assessment system must support teaching that places greater emphasis on in-depth learning and systematic progression.[9] The Committee wishes to emphasise that renewal of the curricula and the work on assessment schemes must consider the possibility of providing instruction to students on a high and advanced subject level.

When it comes to framing conditions relating to legal matters, the Committee finds it in place to recommend a clarification of the rules and regulations,

[9] Report to the Storting (Meld. St. 28) (2015–2016), p. 57

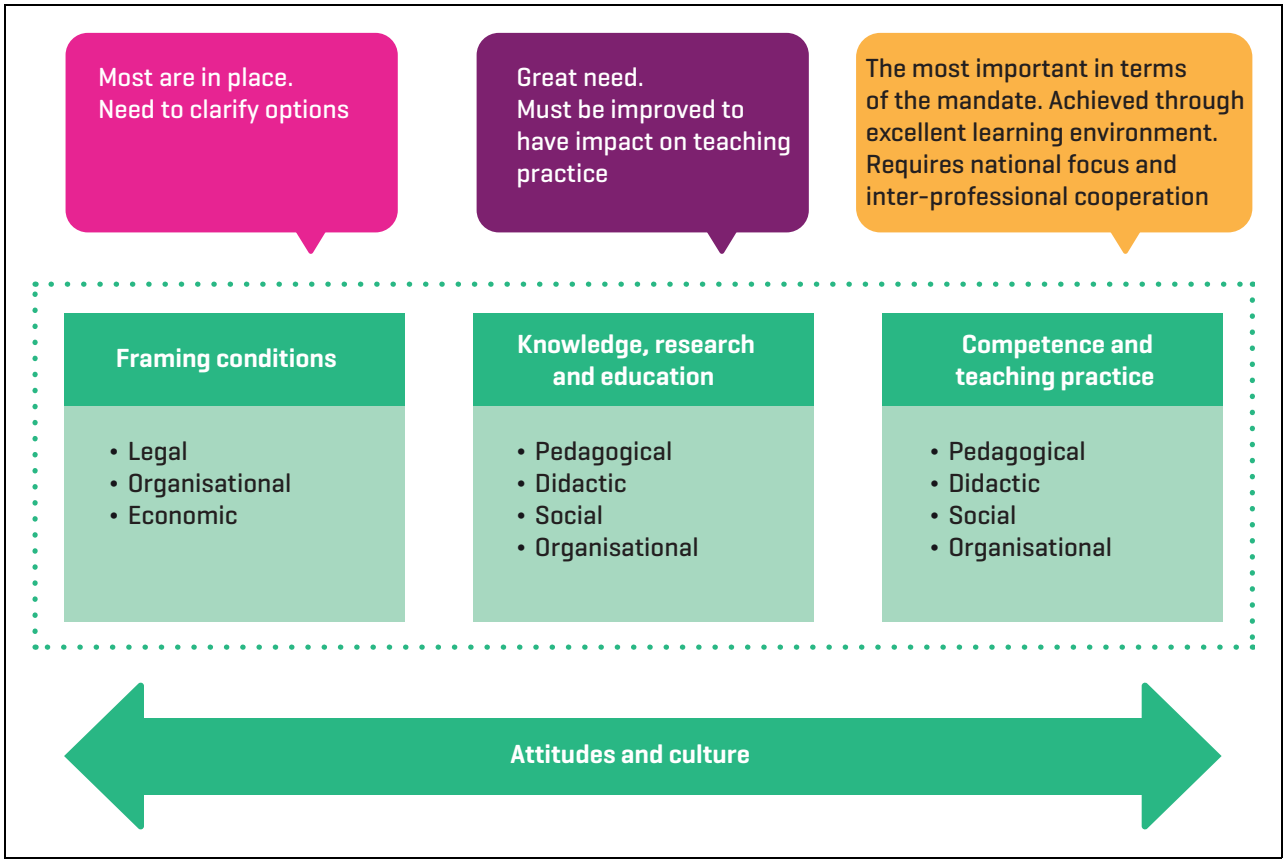


Figure 1.3 Ranking the recommendations

where examples of good use of the actual available options that are found within the legal, organisational and financial frames are provided. There is also a need for the County Governors to coordinate their interpretation of the Education Act.

Relating to the category *Knowledge, research and experiences,* the report shows that there is a great need and stated wish from all stakeholders to have more knowledge about and research on students with higher learning potential. Here concrete measures are very important and necessary if we are to increase the level of knowledge that teachers, school leaders, school owners, teacher training staff and the PPS [the pedagogic, psychological counselling service] have. Such research must be published and lead to changes the instruction given by teachers. If the students with higher learning potential are to experience real changes in and improvement of the teaching, the knowledge must be translated into action. Hence, the measures in the category *Competence and teaching practice are of primary importance for achieving* the goal of a better school programme on a higher and advanced level. The attitude of teachers and school leaders in relation to students with higher learning potential is very important for developing the competence of the students, and attitudes are changed through knowledge. A culture characterised by high ambitions for all students is created in a collective professional community where teachers examine and improve their teaching on an on-going basis.[10]

### 1.4.1 The recommendations

The recommendations are presented below in relation to the three above-mentioned categories. The Committee points out the importance of realising that it is in interaction that the measures will have an impact relating to the goal of achieving better quality in the teaching of students with higher learning potential.

It is the Committee's assessment that together, the measures are a satisfactory response to the challenges in the three systemic acknowledgements, but the actual effect of the measures depends on all stakeholders assuming responsibility and developing quality on all stages. All in all, we see that the realisation of effects will stand or

[10] OECD 2013a, Wiliam 2014

fall on whether the schools can realise an excellent learning environment.

All levels in the education sector must assume responsibility, support each other and communicate clear expectations. This will be elaborated on in the chapters below.

Table 1.1 The Committee's Recommendations

| Framing conditions | Knowledge, research and experience | Competence and teaching practice |
|---|---|---|
| *The Committee recommends that the national authorities:*<br>– Amend section 1-3 of the Education Act to clarify that the provision also includes students with higher learning potential.<br>– Clarify what options there are in today's rules and regulations for school leaders, school owners and County Governors to take action, for example through national competence-raising measures, such as *Regelverk i praksis* [Rules in practice] and RefLex (see Chapter 6.2).<br>– Ensure that the progression descriptors in the subject curricula provide examples of competence on a high and advanced level, and provide support for the teachers' work on differentiating the instruction for students with higher learning potential. Development of these descriptors must take place in conjunction with the subject renewal in the main Knowledge Promotion curriculum. | *The Committee recommends that research environments:*<br>– Conduct high-quality research on students with higher learning potential in close contact and cooperation with the teacher-training institutions and schools.<br><br>*The Committee recommends that the national authorities:*<br>– Concentrate resources on research dedicated to this student group. Critical success factors are strong research communities, and stronger links between research, teacher training and school to influence classroom practice.<br>– Ensure that research is coordinated and communicated to the sector.<br>– Ensure that differentiated instruction for students with higher learning potential is included as a topic in:<br>  – School-leader and teacher training, training in special-needs teaching and training in pedagogic-psychological counselling<br>  – Further education and continuing professional development (CPD)<br>– Every four years systematically map and evaluate the effects of measures for students with higher learning potential.<br>– Ensure that competence programmes are developed for the pedagogic-psychological counselling service and special-needs teaching institutions relating to learning difficulties for children and young persons with higher learning potential. | *The Committee recommends that the school owners:*<br>– Improve capacity in schools and between schools to ensure systematic follow-up of students' learning.<br>– Assume responsibility to ensure that schools and the pedagogic-psychological counselling service has competence in and the resources for identifying students with higher learning potential, and for differentiating instruction according to their needs.<br><br>*The Committee recommends that school leaders:*<br>– Use existing research and facilitate for the flexible organisation of students with higher learning potential.<br><br>*The Committee recommends that teachers:*<br>– Use research-based knowledge and vary their teaching methods through such approaches as in-depth learning and enrichment.<br><br>*The Committee recommends that the national authorities:*<br>– Assess measures to help them ensure that the school owners cooperate and assume responsibility for programmes that can accelerate learning for the relevant students.<br>– Ensure that digital learning resources are developed for students, which can, for example, promote in-depth learning in all subjects.<br>– Ensure the development and application of an e-learning module for school and the pedagogic-psychological counselling service to raise its competence when it comes to students with higher learning potential. |

Table 1.1 The Committee's Recommendations

| Framing conditions | Knowledge, research and experience | Competence and teaching practice |
|---|---|---|
| | | – Assess expansion of the teacher specialist programme to include knowledge about students with higher learning potential.<br>– Develop knowledge-based mapping and guidance material for identification and didactic guidance in subjects for the schools, the local authorities and the pedagogic-psychological counselling service.<br>– Ensure that differentiated instruction for students with higher learning potential is included as a topic in national programmes and guidance material. |

Chapter 2

# The report and the Committee

Figure 2.1

This chapter presents the Committee and explains how it has worked on the report and the knowledge base. The Committee's interpretation of the mandate is presented, which comprises basic education in its entirety, and includes all students and apprentices/trainees, hereinafter referred to as students. The Committee has chosen the term *students with higher learning potential,* and this will be used throughout the report. In some cases, the term *gifted children* is used when we refer to research or quote directly from a source that uses this term.

The report is anchored in the Norwegian Education Act, the Regulations relating to the Education Act and the Knowledge Promotion curriculum.[1]

[1] Subject curricula, the distribution of subjects and teaching periods, the Core Curriculum and Quality Framework

## 2.1 Background for the report

> It is a mystery how caring adults, who would not dream of forcing a child growing faster than the average to wear too small shoes, would for some reason insist that a child whose intellectual development is growing faster than average should follow teaching programmes that are too "small" for the child's fantasy and intellect.
>
> Ole Kyed 2015, p. 216, the Committee's translation

The background for the report, as presented in the mandate, is the Government's intention to establish a more long-term and holistic effort for

- students who achieve on a high academic level
- students with special abilities and talents
- students who have the potential to reach the highest academic levels

In the press release after the appointment of the Committee, the *Ministry of Education and Research* highlighted the following: "PISA 2012 revealed that Norway has a lower number of students on the highest levels (levels 5 and 6), compared to other countries which also score close to the OECD average. Countries scoring better than Norway in PISA, such as Finland, Germany and the Netherlands, have twice the number of students on the two highest levels."[2] There is no reason why Norway should not have more students on higher or advanced levels, and there is a need for differentiated and adapted instruction to achieve this.

There is little research-based knowledge on students with higher learning potential in the Norwegian context.[3] The work on the report has shown that schools have inadequate knowledge about the students who come under the mandate, and the instruction is only differentiated to a little degree to the needs and abilities of these students. This may be explained by the fact that these students receive little attention in teacher training institutions, and additionally due to the fact there is a culture with insufficient knowledge about students with higher learning potential.[4] Even if to begin with the students are well furnished to perform well in school, they will not perform well unless they have access to the correct teaching material, are acknowledged by the teacher and are given challenges on their level and according to their premises.[5] All students must experience that their potential is appreciated, and the instruction must be differentiated so that all children and young people can develop and utilise their abilities and aptitudes.

## 2.2 The Committee

The Committee is composed of practitioners, education leaders and researchers who have experience and competence in the education field and in basic education in general:

- Jan Sivert Jøsendal, Tønsberg, Director of Education, committee chairperson
- Susanne Skeid Fossum, teacher, Asker
- Stefan Hermann, head of school, Copenhagen
- Ella C. Idsøe, professor, Asker
- Bjørn Tore Kjellemo, head of department, Oslo
- Terje Lohndal, professor, Trondheim
- Mona Nosrati, associate professor, Trondheim
- Mirjam Harkestad Olsen, associate professor, Alta
- Stein Erik Ulvund, professor, Oslo

## 2.3 The Committee's work

The Committee has had eight meetings and made a study trip to England and Wales to visit schools and attend meetings with researchers, the authorities and the National Association for Able Children in Education (NACE). In Norway, Committee representatives have visited schools and met students, teachers, school leaders and school owners. This has given insight into the challenges and opportunities that exist to give students with higher learning potential differentiated instruction and good school programmes.

The Committee has invited a number of organisations and experts to the meetings so they could offer input on key issues in the Committee's work. These include Elevorganisasjonen (the School Student Union), *Faglig råd for PPT* [PPT: Expert council for the pedagogic, psychological counselling service, PPS], the National Parents Committee for Primary and Secondary Education (Norwegian abbreviation FUG), KS (organisation for the municipal sector), *Nasjonalt råd for lærerutdanning* [Norwegian council for teacher training], NHO [Confederation of Norwegian Enterprise], Norwegian Association of Graduate Teachers (Norsk Lektorlag), Skolelederforbundet [Norwegian Association of Heads of School], Norwegian Union of School Employees (Skolenes Landsforbund), and Union of Education Norway (Utdanningsforbundet). Moreover, the Committee has met with and received input from NGOs, including the parental organisation for children who think faster than average *Lykkelige barn* [Happy children]. The Committee invited interested parties to an input conference in the spring of 2016 where various experts and organisations participated. This input has helped to make the Committee's work even more relevant.

Quotations used in the report stem from visits and meetings held during the work process and from verbal and written input received by the Committee. We have made a point of giving voice to students, teachers and school leaders by using direct quotations from this input. We do this to raise visible individual voices that illuminate the daily life in school as it is for students with higher

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2 Ministry of Education and Research 2015

3 Idsøe and Skogen 2011

4 Brevik and Gunnulfsen 2016, Mathisen and Olsen 2016, Idsøe and Skogen 2011

5 Børte et al. 2016, Idsøe 2014a


Figure 2.2 The Jøsendal Committee website

Source: www.josendalutvalget.no

learning potential. The quotations are not attributed and are not listed in the Committee's reference list. Nonetheless, they constitute an important contribution to the total knowledge base.

To secure quality and to anchor the work, the Committee has engaged several external persons from relevant environments to read drafts of the report.

In the spring of 2016, the Committee established a website to make information about its work and mandate publicly available and to publish all the minutes from the Committee's meetings. Here, film clips from all the input given at the Committee conference are also available. The Committee has encouraged interested parties to supply input on the website, using the e-mail address josendalutvalget@udir.no.

## 2.4 The knowledge base

The Committee was asked to draw up a knowledge base founded on national and international research and experience to serve as the foundation for its assessments and recommendations. This knowledge base comprises relevant research from statistics, public documents, research reports, scientific articles, textbooks and reports. The Committee finds that there is little research and statistics relating particularly to students with higher learning potential in Norway. Experience-based knowledge from organisations, advisory bodies, the PPT (the pedagogic, psychological counselling service), local authorities, schools, students and parents have therefore been important knowledge sources in our work. An analysis of the Student Survey from 2013 and 2014 is highlighted to show how high achieving students experience and assess their learning environment in the Norwegian context.[6] The responses are considered together with input received by the Committee.

To obtain an overview of research in an international context the Committee has cooperated with the Norwegian Knowledge Centre for Education, which has compiled a research summary. This describes some important qualities that must be present if students with higher learning potential are to have good instruction in school. The Committee has also looked at international studies to give a brief description of the results of Norwegian students in an international context. These studies also show some interesting characteristics

6 Wendelborg and Caspersen 2016

of Norwegian teaching practice. This is dealt with in Chapter 3.

Due to the report's time frame, the Committee has been unable to dig in-depth into education policies and practices in many countries. We therefore chose countries with comparable school cultures, such as Denmark, Finland, Sweden and Scotland. England and Wales, with extensive experience in differentiating instruction for students with higher learning potential, have also been highlighted in the report. We also point out that several countries have extensive experience of educational measures for students with higher learning potential. Among these countries are the USA, Australia and the Netherlands.

## 2.5 Processes parallel to the Committee's work

Prior to and during the Committee's work, the national authorities have initiated a number of measures for students with higher learning potential. Here we refer to some examples of parallel processes and measures. The examples use different terms in dealing with this student group: students with higher learning potential, students with potential to achieve on higher levels and academically gifted students. The Committee wants the report to contribute to creating common terminology in the Norwegian context.

- In the spring of 2016 the Norwegian Directorate for Education and Training launched a net-based resource bank for differentiated instruction where students with higher learning potential are a central theme.
- *Tett på realfag* [Closer to natural science] is a national strategy for natural science in day-care institutions and primary and secondary education and training (2015–2019). The goal is that more children and young people should achieve on a higher and advanced level in the natural science subjects. The strategy aims to help high achieving students to utilise their potential in natural science through differentiated instruction and the opportunity to speed up their schooling.
- As a stage in the *Tett på realfag* strategy, talent centres are being tested in four knowledge centres in Norway. This is a programme for students who want to study in-depth and be given greater challenges in the natural science subjects. The talent centres in Norway will initially be for students in years 7 to 10 in lower secondary school and students in the first two years of upper secondary education. The target group includes students who achieve on high levels and students who have the potential to achieve on a high level.
- The new *strategy for language, reading and writing* aims to strengthen the language, reading and writing skills of all children and students. The strategy aims to strengthen staff competence and applies to day-care institutions and primary and secondary education and training. The following target groups are especially in focus: 1) minority language children and students, 2) children and students with language difficulties, 3) students with reading and writing difficulties, and 4) boys and high achieving students.
- *National centres* have been assigned the task of developing learning resources in their assignment letters for 2015, focusing on academically gifted children.
- *Den virtuelle matematikkskolen* [The virtual mathematics school] is a programme for students in lower secondary school who need

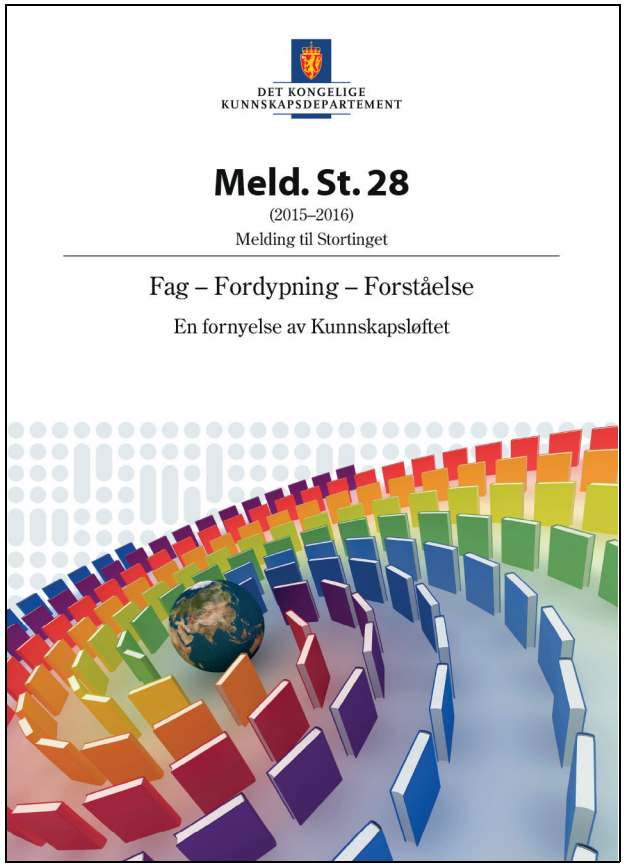


Figure 2.3 Meld. St. 28 (2015–2016) Fag – Fordypning – Forståelse [Report to the Norwegian Storting: Subjects – In-depth studies – Understanding]

extra support or challenges, and for students who want to skip levels to move ahead in the mathematics subjects at a quicker tempo. The goal of the project is to test new forms of ICT-based instruction to generate a sense of mastering and motivation through differentiated instruction.

- *Ungdomstrinn i utvikling* [Lower secondary school in development] is a national programme offering support for local development activities in classroom management, mathematics, reading and writing. The programme features three key measures: school-based competence development, learning networks and educational resources. Some of the resources have examples of instruction that targets students with higher learning potential.
- *Kompetanse for kvalitet [Competence for quality] is a national strategy for further education and continuing professional development (CPD) for teachers and school leaders up to* 2025. The frameworks have been developed in cooperation with KS, the employee organisations, teacher training institutions and the *Ministry of Education and Research*. Differentiated instruction is one of the guidelines for the content of the further education and continuing professional development (CPD) programmes. High achieving students have especially been put on the agenda in connection with the development of the further education and continuing professional development (CPD) programmes in mathematics.
- In Report to the Norwegian Parliament no. *28 (Meld. St. 28 (2015–2016))* on the content and approaching renewal of the Knowledge Promotion curriculum, in-depth learning is highlighted as an important change of course for better learning for all students. The Report proposes that all subjects in primary and secondary education and training and the common core subjects in upper secondary education should be renewed. They should be less comprehensive and be given clearer priorities while the ambitions for students' learning will be raised. The Report proposes to renew the definition of competence: "Competence is acquiring and applying knowledge and skills to master challenges and solve tasks in known and unknown contexts and situations. Competence means understanding and the ability to reflect and think critically".[7]

[7] Report to Parliament 28 (2015–2016)

## 2.6 The Committee's interpretation of the mandate

In its interpretation and definition of the mandate the Committee attaches importance to terminology that makes it clear that all students have learning potential, but that some of them have higher or extraordinary learning potential. Input the Committee has received shows that many students are not given the challenges they need, while they want to use and develop their academic and creative abilities.

Teachers state that they would like to raise their competence in teaching strategies that can be used to promote students' metacognition, self-regulation and problem-solving strategies.[8] School is obliged to give individual students differentiated instruction, and this also applies to students who are given inadequate subject and academic challenges, and who do not receive differentiated instruction which helps to maintain their motivation for learning in school. According to the mandate, the Committee shall propose measures which give students with higher learning potential better instruction, based on knowledge, input, analyses and assessments. The knowledge base shows that there is a need to examine in more detail key factors in the learning environment if students are to have the opportunity to develop their learning potential.

To provide the students with the opportunity to develop their learning potential, the learning environment of the school must have high ambitions for all students. Had the learning environment in practice been accommodating, rich and responsive, while also providing for the needs of all the students through differentiated instruction, then the categorisation and definition of terms would probably not have been necessary.[9]

Below an explanation is given of the following terms: *students with higher learning potential, excellent learning environment* and *differentiated instruction* for all students.

### 2.6.1 Students with higher learning potential

> It's not only about how much we know and can do, but how we learn new things and how quickly this can occur. Some of us simply learn incredibly fast.
>
> Input from *SkoleProffene* [the School Pros – the change factory, an organisation aiming to introduce change through input from young people]

[8] Caspersen et al. 2014, input from teachers

[9] Idsøe 2014a

More than 100 terms are used in international reports about students with higher learning potential.[10] The variations of these terms appear in different combinations with the words *giftedness*, *abilities*, *talent* and *intelligence*. The many terms are related to their cultural context and which fora the research on the students has been published in.[11] Moreover, research shows that we are talking about a heterogeneous group of students. Some students have high potential in one subject or in one area of a subject, while others have exceptional learning potential in several subjects and areas. In addition to a higher learning potential, some students may have emotional or social difficulties. They may have learning difficulties, ADHD, ADD, autism, or they may have a physical challenge (for example relating to vision or hearing). In research and literature these are called twice exceptional students.[12] Some students may be extra sensitive, which means that they are more receptive to nuances and details others do not necessarily notice.[13]

Earlier, the Nordic countries have been reluctant to designate students according to academic abilities to avoid classification. The main idea underlying this has been to promote development for all students without categorising them into groups.[14] In recent years, both Sweden and Denmark have chosen terms that build on the word *giftedness* (*särskilt begåvade elever*[15] *[particularly gifted students]* and *højt begavede børn*[16] *[highly gifted children]*). The Committee has deliberately chosen not to use the term giftedness as we believe the association with "gift" emphasises that it has been inherited. Internationally many countries have dropped the idea that intelligence is inherited, static and unchanging, and rather think of it as dynamic and fluid.[17]

The Committee considers achievement and intelligence to be derived from both inheritance and environment. Strength of will, motivation, stamina, self-control or impulse control are examples of variables which represent self-effort and the importance of the environment.[18] We also base our thinking on a view of learning which emphasises growth,[19] and that *all* students must have the opportunity to develop their learning potential through an excellent learning environment.

Students with special abilities or talents in sports and culture often have separate learning arenas outside school. This does not apply to the same extent to the five common core subjects (English, mathematics, natural science, Norwegian and social studies). The Committee points out that measures to improve the instruction for the students in both theoretical and practical-aesthetical subjects in the entire primary and secondary education and training learning path should be given priority.

Students with higher learning potential constitute a complex group of individuals and personalities with differing instruction and development needs; they are just as different from each other as other children and young people. In the assessment of the Committee, students with higher learning potential may constitute between 10 and 15 per cent of the school population.[20] In our report we also use the construct students with exceptional learning potential. These students often show that they have good aptitudes or special abilities, and they often have an IQ of 130 or more. These students may constitute between 2 and 5 per cent of the student population, but there is not necessarily a causal link between IQ and school achievements.[21] It is important to point out that the groups are dynamic, and that this is not a fixed group of students in Norway's student population.

The term students with higher learning potential in this report comprises those students who achieve on high and advanced levels and those students who have the potential to do so. School can use tests to obtain information about students who are high achievers, while other students with higher or extraordinary learning potential often show their strengths in other areas than what can be seen through grades and tests.

### *Students with higher learning potential*

Some characteristics of this group are that they are most satisfied when they are in a stimulating and challenging learning environment with many and varied activities and opportunities. The earli-

10 Bailey et al. 2008, Børte et al. 2016, Eurydice 2006, Freeman et al. 2010
11 Børte et al. 2016, Freeman et al. 2010
12 Børte et al. 2016
13 Idsøe 2014a
14 Eurydice 2006
15 Skolverket 2015a
16 Mehlbye et al. 2015
17 Freeman et al. 2010
18 Renzulli 2005, Skogen and Smedsrud 2016
19 Dweck 2006
20 Gagné 2005, Theilgaard and Raaschou 2013
21 Gagné 2005

est signs may be that they are curious and that they have early and rapid language development with more nuances in their language than their peers.[22] Since many have very good memories and learn quickly, they may have a great need for attention and stimulation. In their lessons, they usually require less repetition and are quicker at understanding concepts within "their" area than their peers.[23]

*Students with exceptional learning potential*

Students with exceptional learning potential have special abilities, may learn extraordinarily quickly and may in many contexts be far ahead of their peers. They can think in complex ways, are very curious and good at problem solving.[24] They generally also have better stamina and have better concentration over extended periods of time. Another feature is that they are better able to work from the abstract to the concrete compared to their peers, who often need to start with the familiar and approachable before expanding to the abstract.[25]

### 2.6.2 Challenges the students may encounter

> Teachers often believe that we know everything, but that's not the way it is. We're not always good in all subjects, and besides, it's not what we know from before that is important.
>
> Input from *SkoleProffene*

The challenges and misperceptions that students with higher learning potential may encounter may be due to a lack of sufficient knowledge about them and their needs when it comes to the people they are interacting with. The challenges may be academic and interpersonal, individual and societal. This means that these students in some contexts function well, experience well-being and are challenged academically, while in other contexts they may stagnate and give up.[26] The social aspects are highlighted as particularly difficult, and some struggle to find common bonds and feel they are different.[27]

Of course, not all students with higher learning potential have serious social problems. While they might be different, the Committee has met students who function well and have no major challenges. What many of them have in common is that they have not been given sufficient academic challenges, differentiated instruction or understanding.

Students with high academic achievements are often acknowledged for this, but they may also have to deal with little supervision and at times an absence of instruction due to the widely-held belief that these students can cope on their own. This is also an attitude found in such countries as Finland, Australia, Germany, Austria and Switzerland.[28] The lack of academic stimulation may lead to truancy, behaviour problems, frustration, unused potential, and on top of this, these students may be erroneously diagnosed. They may experience school as meaningless, and may be bored and unmotivated.[29]

It is a myth that students can acquire knowledge without help from others, and that they have no further need for differentiated instruction according to their abilities and potential.[30] Students tell the Committee that they have not been taught useful work habits or basic learning strategies. These students may then later encounter problems when tasks in lower secondary school, upper secondary education or higher education become more complex.[31] For some students this may lead to underachieving, and their performance will dip below what they have the ability or potential to achieve. The absence of differentiated instruction and academic stimulation, as well as negative relationships to teachers and co-students, may cause these students to lose their motivation for learning. At the same time, they do not want to stand out as different from the other students and may be reluctant to show what they can do. Under such circumstances, these students may begin to perform poorly.[32]

Misperceptions may impede their academic development and create unnecessary challenges and irritation in their daily life in school, in their continuing education and in their mastering of life.[33]

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22 Idsøe 2014a
23 Idsøe and Skogen 2011
24 Renzulli 2005
25 Mehlbye et al. 2015
26 Nissen 2012
27 Børte et al. 2016, input from NGOs and expert environments.
28 Børte et al. 2016
29 Børte et al. 2016, Idsøe and Skogen 2011
30 Mathisen and Olsen 2016
31 Nissen 2012
32 Siegle 2013
33 Børte et al. 2016

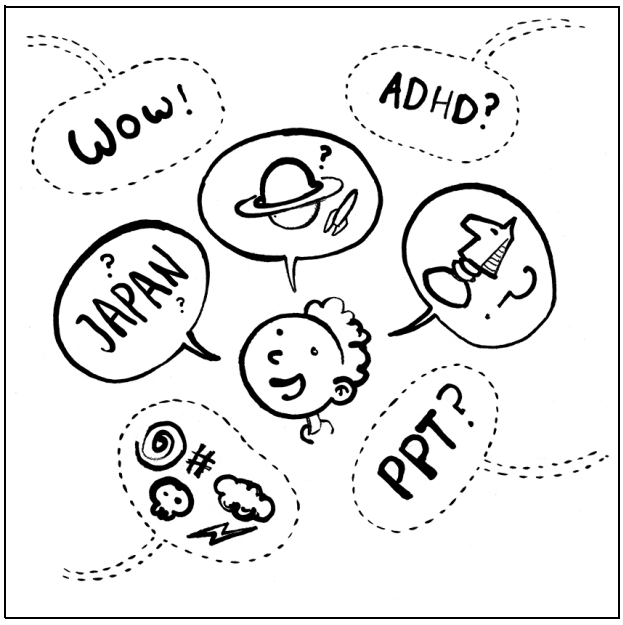


Figure 2.4

Mathisen and Olsen (2016) have followed three students with higher learning potential and examined the perception of being included in the instruction of a subject. The students state that they were in a way set apart by the teachers because they were given a role as assistant teacher for their co-students. They would have preferred to work with co-students who were on the same level as themselves so they could learn from each other and work at their own pace. The study concludes that the practice of having students serve as teachers for other students is not a good approach. The students felt that the role was forced on them by the teacher, and they felt stigmatised. Input to the Committee from some younger students shows, however, that there are many sides to this picture that emerges in this study. For example, some of the students felt it was rewarding and academically enlightening to help co-students with tasks, provided that this was not the only approach to differentiation they experienced.[34]

Some students may feel that their learning potential is overlooked. These are students who in some areas show achievements and competence on high levels, but who at the same time encounter problems in other areas in a learning context. Such an uneven subject profile may mean that these students do not receive help, or that they are not acknowledged as having higher learning potential in some subjects or parts of subjects.

[34] Mathisen and Olsen 2016

Some students may have asynchronous development, which means that the emotional, social, motor and cognitive aspects do not develop at the same speed.[35] This means that a student who has very high linguistic and mathematical abilities may be struggling in other areas (motor skills, socially or emotionally), making days in school difficult, or the student achieves below his/her potential. The higher learning potential of some students will then not be discovered due to learning difficulties or other impediments.[36]

### 2.6.3 Excellent learning environment

In this report the Committee introduces the term *excellent learning environment.* Characteristics of this environment are school staff who motivate and stimulate learning for all students through teaching of high quality, differentiated instruction and high ambitions for student learning.

Research, literature and input to the Committee show that many students with higher learning potential experience that the school's learning environment is less than optimal. This is also confirmed by the analyses from the Student Survey (*Elevundersøkelsen*) from 2013 and 2014.[37]

Creating a quality learning environment means more than what the teacher does in the classroom. It means working systematically with student learning through professional cooperation in school. All planning, all work and all decisions made in school must support the students' learning and development.[38] The teachers must reflect on their own and the school's teaching practice and compare this to defined quality descriptors. For this to be done in a good manner, the Committee believes that more knowledge is needed with respect to what characterises an excellent learning environment. Quality descriptors are needed so teachers, school leaders, school owners and the national authorities can use them to obtain insight into what is typical of such a learning environment. This is examined in more detail in Chapter 7.

A learning environment will always be dominated by the people belonging to the environment, how they behave and how they interrelate. School leaders, teachers, other employees, students and their parents together develop the school's learning environment. The development of the learning

[35] Idsøe 2014a
[36] Idsøe and Skogen 2011
[37] Wendelborg and Caspersen 2016
[38] OECD 2013a

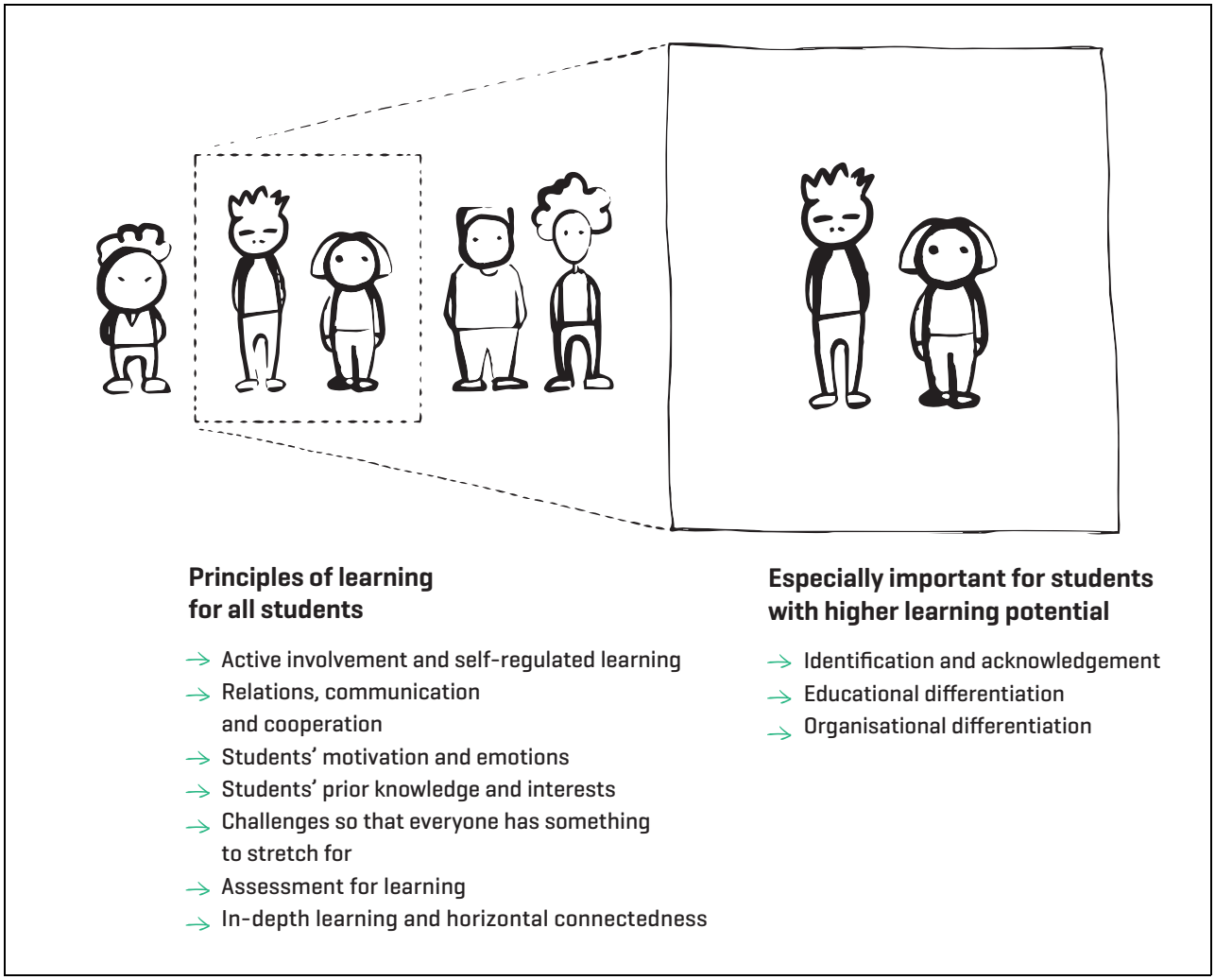


Figure 2.5 Excellent learning environments for all

potential of all the students requires that the school leaders and staff understand that the group of students is heterogeneous. The students learn in different ways, and they may have widely different needs. Bearing this in mind, the Committee has looked closer at which principles promote learning for all students, and examined the extent to which the learning environment can support this.

Figure 2.5 describes the principles the Committee finds should be highlighted as important for the learning of *all* students,[39] in addition to some educational measures that are particularly important for students with higher learning potential. These measures of course do not only apply to students with higher learning potential, but research and input to the Committee has pointed them out as particularly important for this group of students. With more knowledge about the academic situation and potential of the students, teachers gain a better point of departure for providing instruction that addresses individual needs. The Committee believes that school must work purposefully and systematically to differentiate for all students to learn in accordance with the learning principles. Each of these principles must be deconstructed and made part of the profession's continuous work with quality and improved learning for the students.

Students with higher learning potential require educational and organisational differentiation with well-thought out programmes which attach importance to creativity, the students' interests and in-depth learning.[40] To this the Committee adds identification and acknowledgement of the students as a condition for the work on differ-

[39] The principles are based on Dumont and Istance 2010, NOU 2014: 7 *Elevenes læring i fremtidens skole [Pupils' learning in the school of the future]*, OECD 2013a

[40] Idsøe 2014a, Renzulli 2005

entiation and adapted instruction in an excellent learning environment.

### 2.6.4 Differentiated instruction

> All children are different. I cannot treat the students in the same way because they are all different. Some need more time, some learn instantly, and therefore they need to be given different teaching plans.
>
> Input from teacher

"Adapted education" is what school must supply to ensure that all the students have the best possible outcome of the teaching. It may be connected to organising the teaching, educational methods and progression, work with the learning environment and follow-up of local work with subject curricula and assessment. A good learning environment and good systems for local work with subject curricula, assessment and feedback are important requirements for promoting teaching that is adapted to the abilities and aptitudes of the students.[41]

The provision on adapted teaching, what we call here differentiated instruction, is one of the key principles that apply to the comprehensive school, and it applies to all students.[42] Other core learning principles that must be considered together with differentiated instruction are inclusion and the equality principle. The principle of differentiated instruction includes both regular teaching and special-needs teaching. Differentiated instruction is not a goal in itself, rather it is a measure aimed at helping students to experience greater learning outcome.[43]

**Box 2.1 Section 1-3 first paragraph of the Education Act**

"Education shall be adapted to the abilities and aptitudes of the individual student, apprentice and training candidate."

The core curriculum contains guidelines on how to work with student learning which must be seen in conjunction with differentiated instruction, and these are relevant when the teacher plans, implements and assesses the teaching. The students can satisfy the same competence objectives in different ways, and the subject curricula provide room for choosing differentiated instruction through

- varied work tasks
- different subject material

41 Norwegian Directorate for Education and Training 2016a

42 Section 1-3 of the Education Act

43 Norwegian Directorate for Education and Training 2014

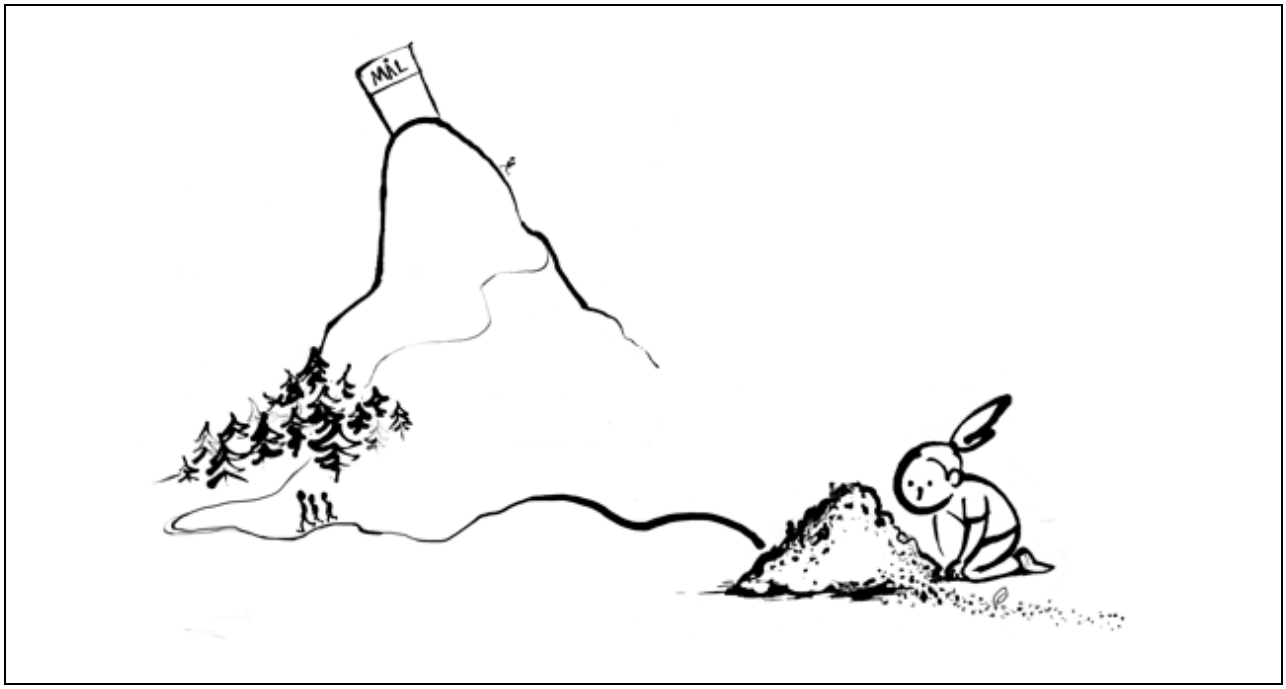


Figure 2.6

- learning strategies
- work methods
- different learning aids
- variation in the organisation and intensity of the teaching[44]

The instruction must therefore be adapted to the students' age and development level, their differing abilities and potential and the composition of the student group.[45]

Even though the principle of differentiated instruction has been in force in the Norwegian school for around 40 years, the research-based knowledge we have about the effect of differentiated instruction is relatively limited, and it varies as to what is actually meant by the concept. There are few clear guidelines dictating how differentiated instruction should be given, and the politicians have generally left the decisions on the practical implementation of differentiated instruction to each school.[46] Some European countries have developed special instruction programmes for students with higher learning potential, but Norway has acted according to the assumption that these students will manage on their own without special supervision. This has been the case even though section 1-3 of the Education Act states that school is obliged to differentiate the instruction for the abilities and aptitudes of the individual student. Students with higher learning potential need instruction that responds to their needs, and school must contribute more than the regular instruction because these students require differentiation.

The education programme must be organised and planned so that it is perceived as inclusive for all the students. Inclusion is in this way seen as a subjective experience. An inclusive learning environment is an environment focusing on four elements: *cultural*, *social*, *academic* and *organisational aspects*.[47]

Figure 2.7 illustrates that the academic, cultural and social aspects must form the core of an inclusive learning environment. Culturally, this is done by opening for diversity, different learning styles and an environment reflecting the different identities of the students. Socially, this is done through building relations and the reflected use of the interaction between students. Academically, this is done through enrichment, mastering experiences and adapted challenges. All the three dimensions have an effect for the students, but with differing degrees of emphasis depending on the learning situation. How the three academic, social and cultural inclusion dimensions are perceived by the students depends on how school has organised the learning environment, which is indicated by the circle. Organisational inclusion occurs through accessibility and a high degree of flexibility. It comprises various activities, group compositions and forms of assessment. It also includes tuition period schedules and use of resources.[48]

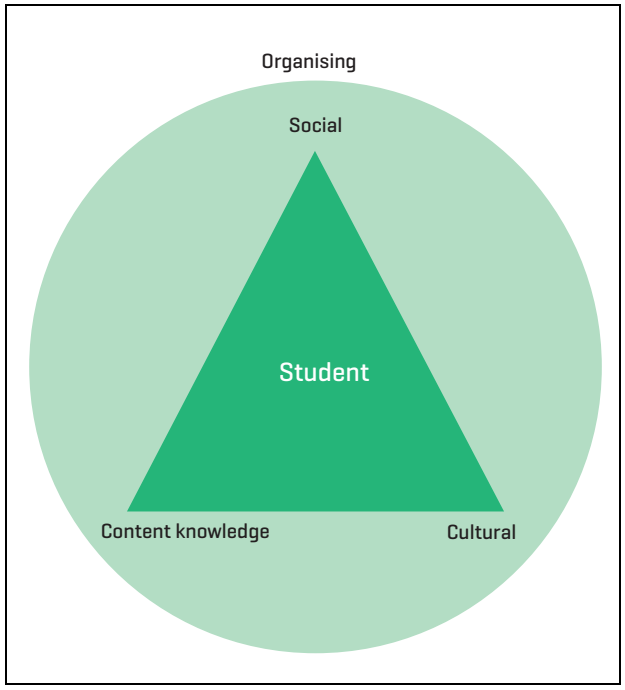


Figure 2.7 The inclusion dimensions

The Committee sees that the combination of identification, acknowledgment, educational and organisational differentiation may give students with higher learning potential better opportunities to feel culturally, socially, academically and organisationally included.

Differentiated instruction is not an individual right as is the case with special-needs teaching, and does not require the preparation of an individual learning plan for the students.[49] Differentiated instruction is a principle schools must satisfy by filling it with educational content.[50] Nonetheless, this is an obligation the school owner has and

44 Norwegian Directorate for Education and Training 2016a
45 Report the Storting no. 16 (2006–2007)
46 Jenssen 2011
47 Olsen et al. 2016
48 Olsen et al. 2016
49 *Ministry of Education, Research and Church affairs* (1998): Proposition to the Odelsting no. 46 (1997–98)
50 Jenssen and Lillejord 2009

must act on. Starting in year 1, all students have the right to formative assessment which is to be used as a tool in the learning process and as the basis for differentiated instruction. Formative assessment is also called assessment for learning in the national programme *Vurdering for læring [Assessment for Learning]*.[51]

Four principles are especially important for good formative assessment. These principles are research-based and take Chapter 3 in the Regulations relating to the Education Act as their point of departure.

The potential of students and apprentices to learn may be strengthened if they:

- Understand what they are to learn and what is expected of them
- Are given feedback informing them about the quality of their work or performance
- Are given advice on how to improve
- Are involved in their own learning by assessing their own work and development[52]

**Box 2.2 Section 5-1 of the Education Act – The right to special education**

Students who either do not or are unable to benefit satisfactorily from regular instruction have the right to special education.

In assessing what kind of instruction is to be provided, emphasis must be especially placed on the student's developmental prospects. The content of the courses offered shall be such that the student gains adequate benefit from the instruction as a whole in relation to the other students and in relation to educational objectives that are realistic for the student. Students who are given special education shall have the same total number of teaching hours as other students, cf. sections 2-2 and 3-2.

Individual guidance that points out the goals, provides feedback and opens for personal reflection is often highlighted as particularly important for students with higher learning potential. The students need concrete goals which motivate them because they are based on their interests. They should have an active role in the instruction and in choosing subject matter, and they need specific feedback focusing on their individual learning process and development.[53]

In Norway, differentiated instruction has generally been perceived as an individualisation process, with individual work, individual guidance and the students' choices, with the absence of teaching that involves the entire class.[54] This unilateral focus on individual work that tones down other methods may affect all the students, particularly those with higher learning potential who often need other challenges through cooperation and in-depth work. Several countries[55] have moved in the direction where differentiated instruction focuses on *personalised learning*. The aim of such an approach is to determine how teachers and schools can best facilitate for student learning, where the point of departure is students' interests, ways of learning, how they best work together with others and what other potential the students have. For students with exceptional learning potential, it is particularly important to differentiate the instruction where importance is attached to their personal learning processes.[56]

The Committee believes that differentiated instruction which considers the students' different aptitudes and abilities does not mean that the students are to sit individually and work with their own plans, but that the instruction is adapted through pedagogical and organisational differentiation in a flexible manner.

### 2.6.5 Special education

Differentiated instruction applies to those who follow the regular instruction and those who are given special-needs instruction. Within the regular classroom, the student does not have the right to any particular type of differentiation beyond the basic framework. Special education is, on the other hand, an individual right the student has in those cases where extra assistance is found to be necessary for satisfactory learning outcome.[57]

In the preparatory work on section 5-1 of the Education Act, a proposition to the Odelsting[58] states that the right to special education does not

51 Norwegian Directorate for Education and Training 2016b
52 *Ministry of Education and Research* 2016b
53 Heller et al. 2005, Skogen 2014
54 Bachmann and Haug 2006
55 Examples include Scotland and Wales
56 Gross 2004
57 Norwegian Directorate for Education and Training 2016a
58 Ministry of Education, research and Church Affairs (1998): Proposition to the Odelsting no. 46 (1997–98)


Figure 2.8 Differentiated instruction compared to special education and regular instruction

Source: www.udir.no

comprise students with the potential to learn more quickly or more than the average. Students who learn quickly are comprised by the general principle that the education must be adapted to individual needs, cf. section 1-3 first paragraph of the Education Act 1-3 ("Education shall be adapted to the abilities and aptitudes of the individual student, apprentice and training candidate").[59] As understood by the Committee, this statement in the preparatory text for the provision in the Act means that speedier progression in itself does not constitute the grounds for special education. Such a right might be triggered if, for other reasons than progression, the student does not achieve satisfactory learning outcome from the regular instruction.

Input received by the Committee shows that it may be unclear as to which right students with higher learning potential have when it comes to special education support. According to section 5-1 first paragraph ("Students who either do not or are unable to benefit satisfactorily from regular teaching have the right to special education"), students with higher learning potential have the same right as all other students to special teaching if they are unable to achieve satisfactory learning outcome from the regular instruction. This may refer to one or more subjects. Students with higher learning potential cannot be excluded because they learn more quickly than others if they need special adaptation. These students may, as other students, have difficulties which prevent them from gaining learning outcome from the regular instruction, for example social difficulties or specific learning difficulties which prevent them from exploiting their learning potential. The student may need greater challenges in one subject, but may have completely different challenges in another.

A practice which excludes students with more rapid progression from receiving the necessary support precisely because they progress more quickly, is deemed by the Committee to be an erroneous understanding and application of the Proposition to the *Odelsting* (Ot.prp.). The PPS needs resources and competence to undertake expert assessments and guide the school on students with higher learning potential and learning challenges.

[59] This is explicitly stated in Proposition to the Odelsting no. 46 (1997–98) in a remark to section 5-1, and is tied to the purpose of special education

### 2.6.6 Examples of barriers to differentiation

> We have a large gap in terms of skills in the classes. In my class I would estimate a gap of four or five years' difference in skill levels, and then it's difficult to reach them all. It's about planning and knowing about the seven in the class who are outstanding. Then I need a plan for them too, not just for those who are struggling. Therefore, we now need tools to determine how to get the best out of the students.
>
> Input from teacher

Realisation of high ambitions and expectations for the students' learning requires that the school differentiates the instruction to the student's level and potential for learning. The Committee has experienced that many schools see differentiated instruction as a vague goal and something that is difficult to implement in practice. Student input to the Committee reveals that in some cases differentiated instruction has consisted of self-study of a textbook from a higher level without guidance or teacher support. We have received input from students who describe many hours drawing in extra books, making their own workbooks, doing tasks over again, copying for the teacher, watering plants or simply waiting. This may cause students to lose their motivation for learning.

The presence of differing opinions on which students are eligible for differentiated instruction is an example of a barrier preventing students with higher learning potential from receiving the assistance they need. Even if the provision in the Education Act is clear, the Committee has learnt that schools and teacher organisations would like to see a clarification of the extent to which school has the right to prioritise low performing students over high performing students if there are inadequate resources to provide good programmes for all. Some schools are uncertain as to whether students with higher learning potential should be given differentiated instruction at all, or they state that this only applies to students who perform poorly or have learning difficulties.[60] The Committee would like to make it clear that the provision relating to special education includes *all* students regardless level of achievement and learning potential.

Input from teachers and teacher organisations reveals that schools find it impossible in practice to implement differentiated instruction for all students. They point out that a classroom may house developmental differences of up to six and seven years and question how differentiated instruction can be implemented. The student organisation asks whether it is feasible for a teacher to implement differentiated instruction in a class with many students. Teachers often find that they should first address the students who for various reasons do not have satisfactory learning outcome from the regular instruction, thus the question remains: how can the instruction be differentiated for the other students in the same class at the same time?[61]

Other input to the Committee indicates that the impediment to implementing differentiated instruction of good quality is limited resources and the absence of didactic tools. An example of this is input concerning budget cuts in the current and coming school years resulting in fewer extra teaching hours. The school leaders want to see an allocation of teacher resources that can make it possible to have quality in the differentiated instruction.

The evaluation of the Knowledge Promotion curriculum showed that the textbook has a strong position and governs the planning and implementation of the instruction,[62] and this may serve as an impediment to differentiated instruction. Getting through the textbook becomes a goal in itself, where it takes precedence over the competence objectives of the curriculum.[63] Dependency on only one learning resource makes differentiated instruction an impossible task. Several schools indicate that teachers first determine what they want to do in the textbook, and only then find a point in the competence objectives to tie it to.[64] The textbook in itself is not the problem as long as it is not the only learning resource,[65] and as long as the teacher is the one who is making plans for the instruction and is in charge of the teaching.

On the one hand, schools are free to choose varied learning resources, and on the other hand, schools have a responsibility for choosing methods and content anchored in the objectives for the teaching. Students shall, for example, be allowed

[60] Input from the organisations

[61] Bunting 2014, Idsøe 2014, Tomlinson 1999

[62] Report to the Storting 28 (2015–2016)

[63] Input from pupils, teachers and school leaders

[64] Input from student teachers, teachers and school leaders

[65] Teaching material has been developed with the aim of satisfying one or more competence objectives, while resources for learning are other material used by teacher and pupils, but which are not primarily developed for use in education and learning in primary and secondary education and training

to "have the opportunity to be creative, committed and inquisitive".[66] The values underpinning the objectives clause must have impact on the methods used in the planning and implementing of the instruction. Using only one learning resource may undermine the ideal of variation and the choice of content and methodology in working with the competence objectives.

Teachers have not acquired sufficient knowledge from their teacher training about what differentiated instruction means in general, and they have little competence in differentiating for students with higher learning potential.[67] This does not, however, release them from the duty to differentiate for this group of students. Teachers, school leaders and school owners have a shared responsibility for ensuring that all students, also those with higher learning potential, will be given good instruction in school. To accomplish this, further education and continuing professional development (CPD) will be required, along with competence-raising of teachers, both in terms of increased in-depth studies of the school subjects and more knowledge about principles of learning and differentiated instruction.

## 2.7 Summary and assessment

The Committee believes that schools must be equipped to manage what on paper appears to be a simple principle – differentiated instruction for all – but which in practice is highly challenging to accomplish. For this to be implemented properly, schools must obtain knowledge about and practice differentiated instruction in accordance with the intention of the Education Act, and the amount of educational resources available must be sufficient to allow differentiated instruction to be viable. More knowledge about students with higher learning potential is needed, and schools need didactic measures and tools to enable them to satisfy the needs and learning potential of *all* students.

The Committee recommends that the national authorities must ensure that differentiated instruction for students with higher learning potential is included as a topic in national projects and guidance material.

The Committee also recommends an amendment to the text in section 1-3 of the Education Act. The provision in force states that "Education shall be adapted to the abilities and aptitudes of the individual student, apprentice and training candidate." We propose the following formulation: "Education shall be adapted to the abilities and aptitudes of the individual student, apprentice and training candidate so that each individual is able to develop and utilise his or her learning potential." The purpose of the amendment is to make it clear that differentiated instruction also includes students with higher learning potential.

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66 Section 1, the objects clause, of the Education Act

67 Brevik and Gunnulfsen 2016, Skogen and Smedsrud 2016

# Chapter 3
# Knowledge, research and experience

Figure 3.1

The Committee has been asked to prepare a knowledge base providing national and international research and experience. The knowledge base has been compiled from relevant research as found in statistics, public documents, research reports, scientific articles, textbooks, public reports and experience from the practice field in Norway and some selected countries.

High achieving students are highlighted in several contexts, and some available data material on this student group is presented in this chapter. The Committee believes that the findings illuminate some characteristics of high achieving students that should be considered together with what we know about students with higher learning potential. Wendelborg and Caspersen (2016) have examined in 2013 and 2014 whether high achieving students[1] stand out from the other students when it comes to the perception of their own learning environment.[2] International studies have something to say about Norwegian students who are high achievers compared to other countries, and what is characteristic of these students. The results also show some features in the teaching practices of Norwegian teachers the Committee finds relevant to point out.

The Committee points out that the findings from the analysis by Wendelborg and Caspersen of the Student Survey and the international studies providing information about learning outcome, do not comprise the entire group of students covered by the mandate. Students with unused potential will not appear in the findings. Moreover, tests alone are not sufficient tools for identifying learning potential. It is necessary to obtain information from other research findings, observation and

[1] The students referenced in the analysis are those who have stated that their grade is 6 (the best) in the subjects written Norwegian, mathematics, natural science and social science

[2] Wendelborg and Caspersen 2016

information (dialogues) which indicate something about the learning potential of the students. This is particularly important for students with higher learning potential who may not always be able to show their competence in tests and mock exams, but rather in other ways.[3]

To acquire knowledge about circumstances that must be present if students with higher learning potential are to have a good school programme, the Committee has consulted international research. The Committee has also cooperated with the Knowledge Centre for Education which has prepared a research summary of pedagogic measures for students with higher learning potential. The Committee has also looked at the experiences of some selected countries with comparable school cultures, such as Denmark, Finland, Sweden and Scotland. England and Wales, with extensive experience in differentiating instruction for students with higher learning potential are also highlighted in the report.

## 3.1 Research and experience relating to students with higher learning potential in Norway

There is some literature on students with higher learning potential, but the quality of what has been published is variable, and only a few truly informative empirical studies are available.[4] This indicates that this group of students has not been on the agenda of research environments in Norway. The Committee can, however, point to the work of Arnold Hofset, who already at the end of the 1960s called for more focus on and differentiated instruction for students with higher learning potential in his doctoral thesis. He expressed concern about their future in school: "In general there is a significant waste of the time and abilities of the gifted children in primary school. The differentiated instruction they are given is inadequate. School sets too low academic demands to make the instruction engaging for them. It exercises a pressure towards average levels and tempo, and the danger is that many will eventually adapt to this. This is taking place in a period of life which is highly important for establishing work habits and aspiration levels, and attitude about oneself and school and education".[5]

According to the author, this was due to the "philosophy of equality" that was present in the Norwegian school system and the controversy about differentiating instruction for the gifted children. Even if the general curriculum from 1939 stated that the "goal for the education is not to help students with different abilities and talents to become equally good at the school achievements, but to give the students an education which in the best possible manner corresponds to their abilities and talents", the Norwegian school often saw equal and fair instruction as the same thing and practised the idea that all students had to learn the same things at the same pace.[6]

In recent years, this student group has received more and more attention through blogs, newspaper articles, Norwegian academic literature[7] and parent groups, such as *Lykkelige barn*. Experiences from Norway and other countries and from international literature show that there needs to be more acknowledgement of students with higher learning potential, and that they must be given an education that provides for their needs.[8] Input received by the Committee confirms this and may be collated with relevant literature about students with higher learning potential. The input shows examples of opinions in the Norwegian context.

To obtain more knowledge about what students believe school can do to give students with higher learning potential a better school education, the Committee has obtained input from the Student Union Organisation and from students across Norway.

Several student voices are represented through input from *Forandringsfabrikken* [the Change Factory] which has met with more than 50 students with higher learning potential from different areas of Norway. The students (*SkoleProffene* – the school pros) state that they know much about how teachers can make classrooms more secure, and that teachers have much to gain from cooperating with them on how to achieve a good classroom environment. Many students talk about the difficulties of learning in a classroom where they do not feel secure.

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3 Freeman 1998, Renzulli 2005

4 Børte et al. 2016

5 Hofset 1968, p. 69

6 Hofset 1968

7 Such as Hofset 1968, Idsøe 2014, Idsøe and Skogen 2011, Skogen and Smedsrud 2016

8 Børte et al. 2016

**Box 3.1 Forandringsfabrikken – the Change Factory**

The Change Factory is a national foundation which invites children and young people from across Norway to share experiences and offer advice for change. The young people call themselves "pros" because they are professionals of the systems and have vital knowledge about how assistance systems and school can improve for them. The advice is presented to the national authorities, government ministries, directorates and researchers and experts in education institutions and Storting [the Norwegian Parliament] – always by the pros themselves.

The Change Factory has twelve years of experience of cooperating with children and young people on developing the quality of the systems. The goal is that the systems will build on the knowledge provided by those who know how the systems work and who have to use them.

The Change Factory has developed Change Philosophy, Change Keys and Change Methods (visual, participatory methodology). The Change Factory is working to ensure that the knowledge of children and young people is valued as highly as knowledge from research and experts. In the project *Lyst til læring* [The Desire to Learn], 3000 students from 40 Norwegian schools have shared their experiences and provided their advice. In the first part of the project the students have related what makes them learn well, and what they believe must be done differently for them to learn even better. In the second part of the project the Change Factory has mapped in-depth method development for four target groups, where one of the groups is extraordinarily gifted children. In cooperation with students and teachers, they will tailor ways of working, ways of learning and frameworks for better daily conditions at school for more students.

Figure 3.2 The Change Factory believes the best opportunities for change are achieved if the students who know today's school well can be included on the team in a more visible and basic way. It is also important that experience and advice from teachers the students see as respectful and committed should also come clearly to light.

Source: www.forandringsfabrikken.no, input from *SkoleProffene*

## 3.2 What do we know about high achieving students in Norway?

There are no central tests designed to provide knowledge about achievements on high and advanced levels in primary and secondary education and training or upper secondary education and training. The national tests are the only central tests we have in Norway which give information about students on different levels, and which also give information about development over time.[9] As these tests were not designed to map students on high and advanced levels, they cannot be used for that purpose. See Box 3.2 for an over-

**Box 3.2 The Directorate of Education's tests**

- Mapping tests during the first school years – using an intervention limit – will be used to spot students who need special follow-up. There are obligatory and voluntary mapping tests.
- Tests that support learning are voluntary, and the results will be used to give formative feedback to the students in the school year in question and as the basis for differentiated instruction.
- The grade-supporting tests are voluntary and may be included in the final assessment (examination and overall achievement grades) in year 8 and year 10. The tests also provide information the teacher may use to give formative feedback to the students during the school year.
- The national tests map the extent to which the students master basic skills in reading, mathematics and parts of the English subject, and will be used by schools and school owners as the basis for quality development in the instruction. The tests are obligatory and are carried out in years 5, 8 and 9.

Source: www.udir.no/vurdering

view of the tests. International studies may, on the other hand, be used to provide information about students' subject competence in selected subject areas. The Committee points out that the results from PISA 2015, TIMSS 2015, TIMSS Advanced 2015 and PIRLS 2016 were not published when this report was written. Nonetheless, the Committee would like to point to the results we have so we can refer to what characterises students on high and advanced levels in Norway in the subject areas that are measured by international studies.

### 3.2.1 Learning outcomes

In recent years, much attention has been paid to the fact that Norway had few students on high and advanced levels in international studies. In general, the results of Norwegian students were declining before the introduction of the Knowledge Promotion curriculum. There was a large decline from 1995 to 2003 in TIMSS, from 1995 to 2008 in TIMSS Advanced and a drop in PISA from 2000 to 2003. The negative development was stopped and followed by improvement in primary and secondary education and training in the period after the introduction of the Knowledge Promotion curriculum. The analysis of the results also shows that there is greater pressure on learning in Norwegian schools in 2011 than in 2007, and that students in schools that have greater pressure on learning achieve better than students in schools with lower pressure on learning. These facts notwithstanding, students do not perform as well as they did in 1995. This applies to years 4 and 8[10] in natural science, and to year 8 in mathematics.[11] The results also show that Norway has fewer students with high achievements in 2011 than in 1995, and the TIMSS reports question whether school fails students with high achievement potential.[12]

#### *Mathematics*

Norway and Sweden have fairly similar results in mathematics with very few students on advanced levels and quite a few on low levels or under the low level, see Figure 3.3. Sweden, however, has a few more students on high levels. The development in Norway and Sweden may suggest that neither of these countries is addressing the issue of students with higher achievement potential well enough. In both countries, the last 10 to 15 years have seen a marked negative development in the proportion of students with high achievement. There are clear indications that both countries have challenges when it comes to giving students differentiated instruction that is adapted to each student's abilities and potential, as is embedded in Acts and subject curricula. Other countries have far more students on the two highest levels, advanced level and high level, than in Norway and Sweden. The area where Norwegian students perform by far the poorest in mathematics is algebra.[13]

Analyses from TIMSS and PISA show that there is good reason to refer to a Nordic profile,

[9] The mastering levels comprise three levels in the year 5 tests, and five levels in years 8 and 9

[10] In 2011 a sample was also made of pupils in year 5, as these are of the same age as pupils in year 4 in many of the other participating countries

[11] Olsen et al. 2013

[12] Grønmo et al. 2010, Grønmo et al. 2012, Lie et al. 2010

[13] Grønmo et al. 2012, Grønmo et al. 2014

**Box 3.3 International studies**

*ICILS (International Computer and Information Literacy Study) is a study of the digital skills of students* in year 9. It is carried out in 18 countries, and is based on data from school leaders, teachers and students.[1]

*PISA (Programme for International Student Assessment)* examines the competences of 15-year olds in mathematics, natural science and reading at a point in time which in most countries represents the end of compulsory school.[2]

*PIRLS (Progress in International Reading Literacy Study)* studies students' reading competence and interest in reading. The study's target group comprises students in year 4. Due to the time when school starts, Norwegian students are one year younger than students in year 4 in the other Nordic countries. Hence, Norway also includes a sample of year 5.[3]

*TALIS (Teaching and Learning International Study)* is the OECD's international study of teaching and learning. The study aims to give insight into important aspects that characterise learning environments and the working conditions for teachers in 30 participating countries.[4]

*TIMSS (Trends in International Mathematics and Science Study)* maps students' interest and competence in mathematics and natural science in years 4 and 8.[5] TIMSS also measures many background variables using questionnaires given to students, teachers and school leaders.[6]

*TIMSS Advanced* measures competence in mathematics and physics of students who have specialised in these subjects in the final year of upper secondary school.[7] Using questionnaires, relevant information is also collected about the students, teachers and schools participating in the study.[8]

1 Ottestad et al. 2014
2 OECD 2013b
3 van Daal et al. 2011
4 Caspersen et al. 2014
5 In 2015, Norway has used years 5 and 9 as the main stages for reporting
6 Grønmo et al. 2012
7 In 2015, there are 13 Years in the Norwegian school, but in 1995 and 2008 there were 12. School only started having a 13-year system in 2009
8 Grønmo et al. 2010, Lie et al. 2010

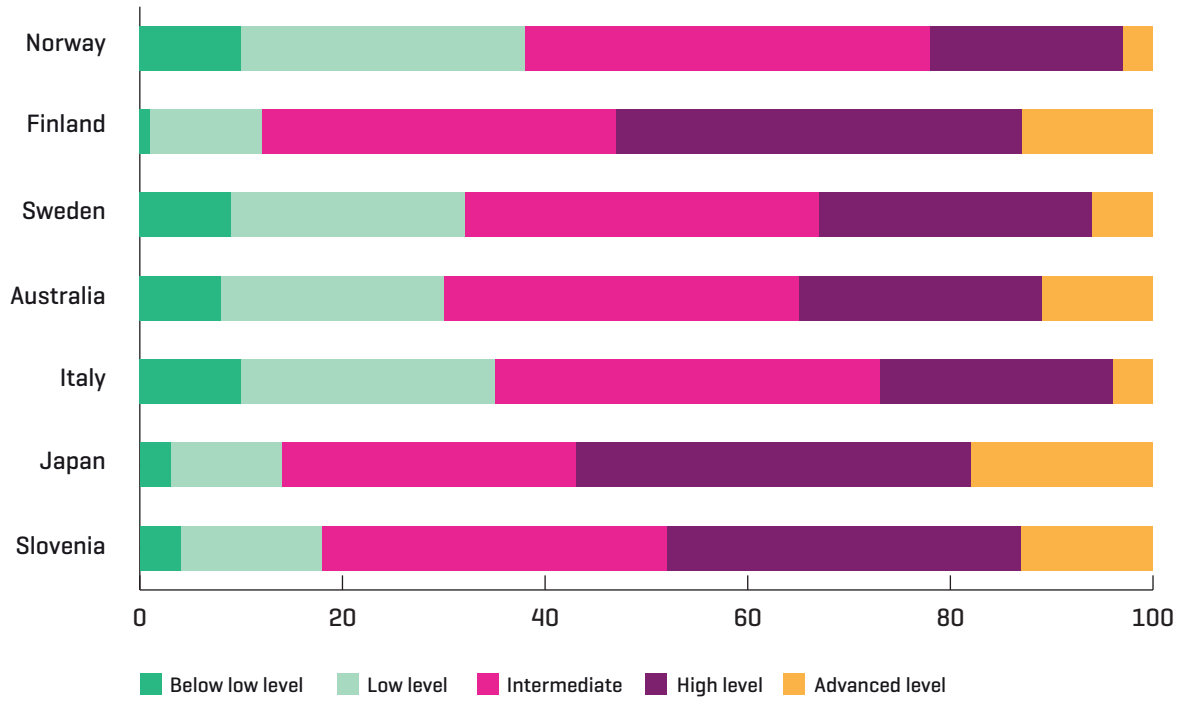



Figure 3.3 Proportion (percentage) of students on different competence levels in mathematics in year 8.
Source: Grønmo et al. 2012

an English-language profile, an East European profile and an East Asian profile. These profiles may in turn be divided into two main types: One attaches most importance to everyday mathematics as is done in the Nordic and English-language profiles. The other attaches more importance to abstract mathematics, as do the East European and East Asian profiles.[14] This in turn is linked to responses from the teachers as to what they attach importance to in their teaching. Even if the Finnish students achieve far better than Norwegian and Swedish students, the Finns also perform the lowest in algebra.[15] This indicates that the content of the subject curricula impacts the student results, and the Committee finds that this needs to be considered in the renewal of the Knowledge Promotion curriculum.

A study of the competence of student teachers at the end of their studies in 2008 showed that Norwegian student teachers had very poor knowledge in algebra.[16] Students who perform well in the mathematics subject often need this type of knowledge in further studies or vocations.[17] In 2008, NOKUT conducted a study of drop-outs in engineering subjects. The study concluded that the main reason for the heavy non-completion rate was that the students did not have basic knowledge in algebra.[18]

The first national sub-examination in mathematics was held in December 2015. NOKUT published the results of this in March 2016. Of the student teachers who completed the sub-examination, approximately 70 per cent achieved the grade C or better.[19]

On 21 June 2016, NOKUT published results of student teachers' national subject-area examination in mathematics from May 2016. All in all, 997 students in the primary school teacher education sat for examinations in teaching knowledge about fractions, decimal numbers and percentage calculation. The national grade distribution shows that as many as 37 per cent of the student teachers failed this examination, while only 0.6 per cent achieved the highest grade. The average grade was E, see Figure 3.4. The numbers per each teacher training institution show dramatic differences across the country.[20]

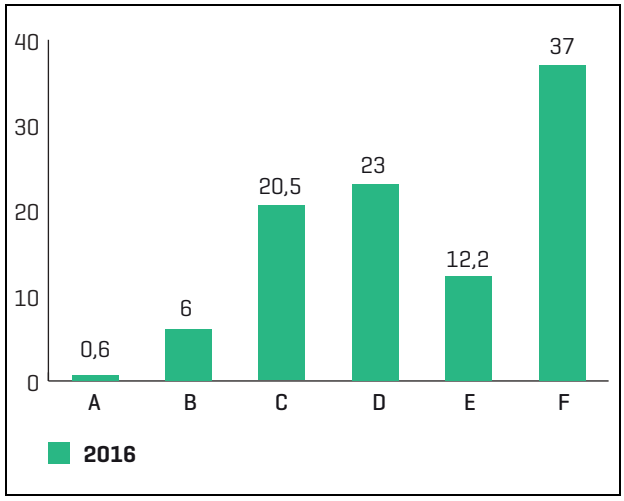



Figure 3.4 Distribution in percentages of grades for the national subject-area examination in mathematics for primary school student teachers in the spring of 2016.

Source: NOKUT 2016a

The Committee sees that content and quality in teacher training may help explain the results achieved by Norwegian students in mathematics. The knowledge student teachers bring to their studies is also important.

### *Natural science*

In natural science, the results show a positive trend from 2003 to 2011, but the results in years 4 and 8 both show that Norway has lost a large proportion of the students who achieve the highest competence levels in natural science. In year 8 it appears that schools have had little success in differentiating the instruction for those who are struggling in the subject. In natural science, physics would appear to be the area where Norwegian students achieve the lowest.[21] If we compare the natural science achievements of Norwegian students with their student peers in the other Nordic countries, the Norwegian achievements are better than the Danish and Swedish results, but markedly weaker than the achievements of the Finnish students,[22] see Figure 3.5. When we compare with Sweden and Finland, we should also consider the fact that their students are one year older than the Norwegian students. In Japan, Finland and Slovenia, students achieve clearly higher, with a larger proportion on the two highest levels and a markedly lower proportion on the low level or under.[23]

14 Grønmo et al. 2014
15 Grønmo et al. 2014
16 Grønmo and Onstad 2012
17 Grønmo et al. 2014
18 NOKUT 2008
19 NOKUT 2016b
20 NOKUT 2016a
21 Grønmo et al. 2012
22 Grønmo et al. 2012

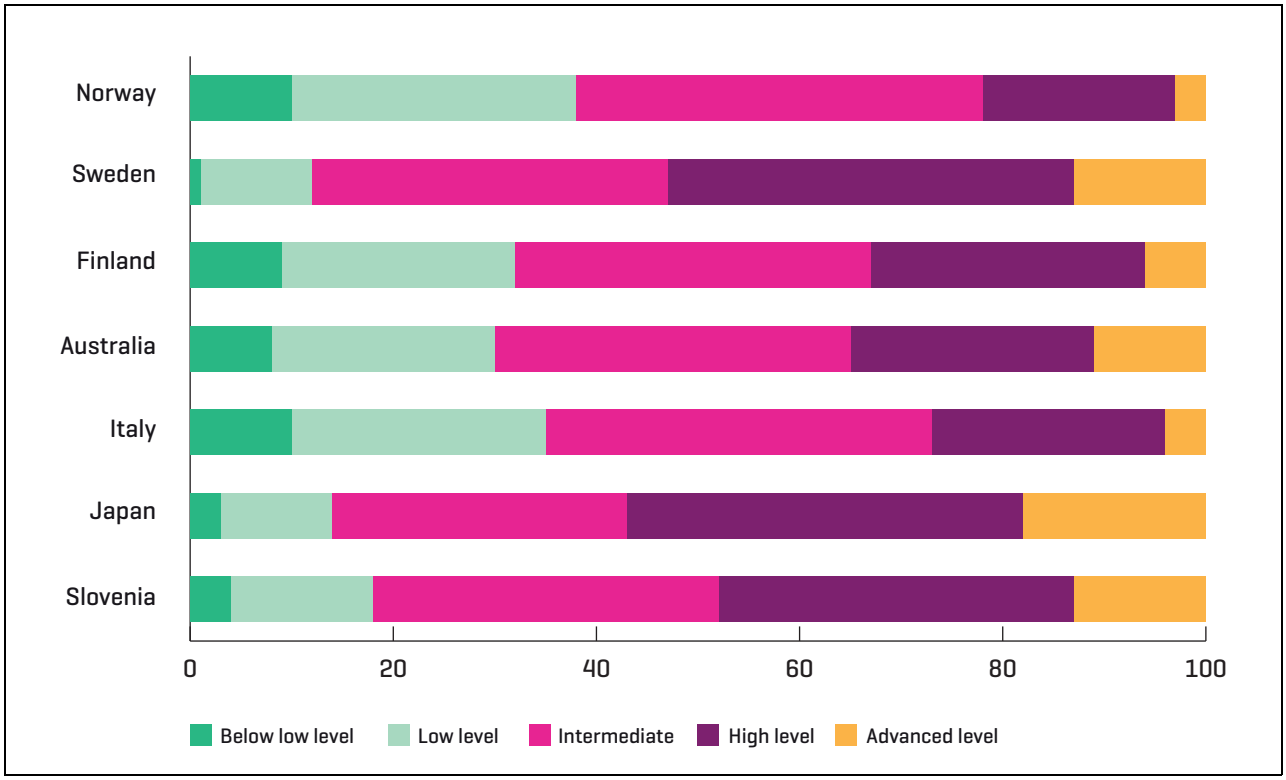



Figure 3.5 Proportion (percentage) of students on different competence levels in natural science in year 8.
Source: Grønmo et al. 2012

*Reading*

The main picture in reading is relatively similar across studies with data from the end of the 1990s and early 2000s and onwards. Norwegian school has on average seen progress in the last ten years. This is mainly because fewer students achieve on the lowest levels, even if we have not had more students achieve on high and advanced levels. In year 5 in Norway, developments are stable from 2006 to 2011 for the best and the weakest groups, while there is a moderate increase in the proportion of students with medium and good reading skills. Denmark has approximately the same development as in Norway in year 5: stable in the top and bottom, and development towards generally improved reading skills on the intermediate levels. In Sweden, we see that the decline in reading skills from 2006 to 2011 is also reflected in the shifts in mastering levels, with fewer on top and more on the lowest levels.[24]

*Digital skills*

Norwegian students have good digital skills compared to students in other countries, and the teachers are positive to using technology in their teaching. The results from the ICILS study of digital skills from 2013 show that Norwegian students are among those achieving highest of the countries in the study. The purpose of the ICILS study was to examine the ICT competence of students, with focus on the individual ability to explore, create and communicate by means of digital tools at home, in school and in society in general. Only the Czech Republic had significantly higher averages than Norway. The group of countries with high achievements also includes Australia, Poland, South Korea and Denmark. The distribution around the national average, i.e. the variation in student results, is relatively modest in Norway compared to several of the other countries in the study.[25]

[23] Grønmo et al. 2012, Grønmo et al. 2014
[24] van Daal et al. 2011
[25] Hatlevik and Throndsen 2015, Ottestad et al. 2014

*Results – upper secondary education*

The analyses from TIMSS Advanced 2008[26] showed a marked decline in the achievement of Norwegian students in both mathematics and physics in the final year in upper secondary education. The decline occurred as the same time as the proportion of students in Norway who chose in-depth studies declined in both subjects. Considering all the measures that have been launched to increase recruitment to natural science, this result is unsettling, both in terms of student achievements and the recruitment to the subjects. Even though there is a clear decline in physics, the average score for Norwegian students continues to be relatively good compared to students in other countries. In mathematics, the Norwegian achievements were, on the other hand, significantly lower than the international average. The decline in physics in 2008 was due in the most part to students being unable to master basic algebra.[27]

**Box 3.4**

*Elevundersøkelsen* (the Student Survey) is an annual web-based questionnaire asking students from year 5 up to the end of upper secondary education to state their opinion about matters that are important for learning and well-being in school. The Student Survey is obligatory in year 7 and year 10 and in year 1 of upper secondary education (Norwegian abbreviation Vg1), while participation is voluntary for the other years. The Directorate for Education and Training is responsible for the implementation and design of the Student Survey, while NTNU *Samfunnsforskning* (Norwegian University of Science and Technology Social Research) is responsible for the analyses and reporting.

Source: Wendelborg and Caspersen 2016

### 3.2.2 Students on high levels in mathematics master problem solving well

An analysis of PISA results in the Nordic countries where the focus has especially been on high achieving students shows that there are a number of differences between students with medium and high achievements. The analysis shows that high achieving students come from homes which have as a rule higher education levels, greater cultural capital and higher socio-economic status. There are also differences between high achieving students and students whose performance is on a medium level in the manner they study and acquire knowledge in mathematics and the relationship they have to the subject and school. High achieving students use more control, in-depth and memory strategies and less group work. They are also more motivated by competitive learning situations, and have a more positive attitude to school and teachers, are more self-driven and exhibit greater self-confidence in the subject.[28]

The students characteristically have a high level of self-confidence in the subject, and they learn mathematics in another way than students with average results. High achieving students try harder to find information if there is something they do not understand, and they work harder to understand new concepts by relating them to something they know from before. High achieving students review modelling examples less often to remember how to solve mathematics tasks than the average students. They are also less interested in determining what the most important things to remember are when they are studying for a mathematics test. This coincides with results from PISA 2012, which showed a strong link between achievements in mathematics, reading and natural science and achievements in problem solving. This applies to students in the OECD countries and to Norwegian students.[29]

High achieving students also have higher internal and external motivation, stamina, self-perception and expectation of mastering than the average student. These results are confirmed for all the Nordic countries.[30] The Student Survey from 2013 and 2014 shows that the highest achieving students, here measured as students with the grade 6 in the four subjects written Norwegian first-form language, mathematics, social science and natural science, have slightly lower motivation than the results would indicate. The highest achieving students therefore do not follow the pat-

[26] TIMSS Advanced has been carried out three times, in 1995/1998, in 2008 and in 2015

[27] Grønmo et al. 2010, Lie et al. 2010

[28] Nyström 2016

[29] OECD 2013a

[30] Nyström 2016

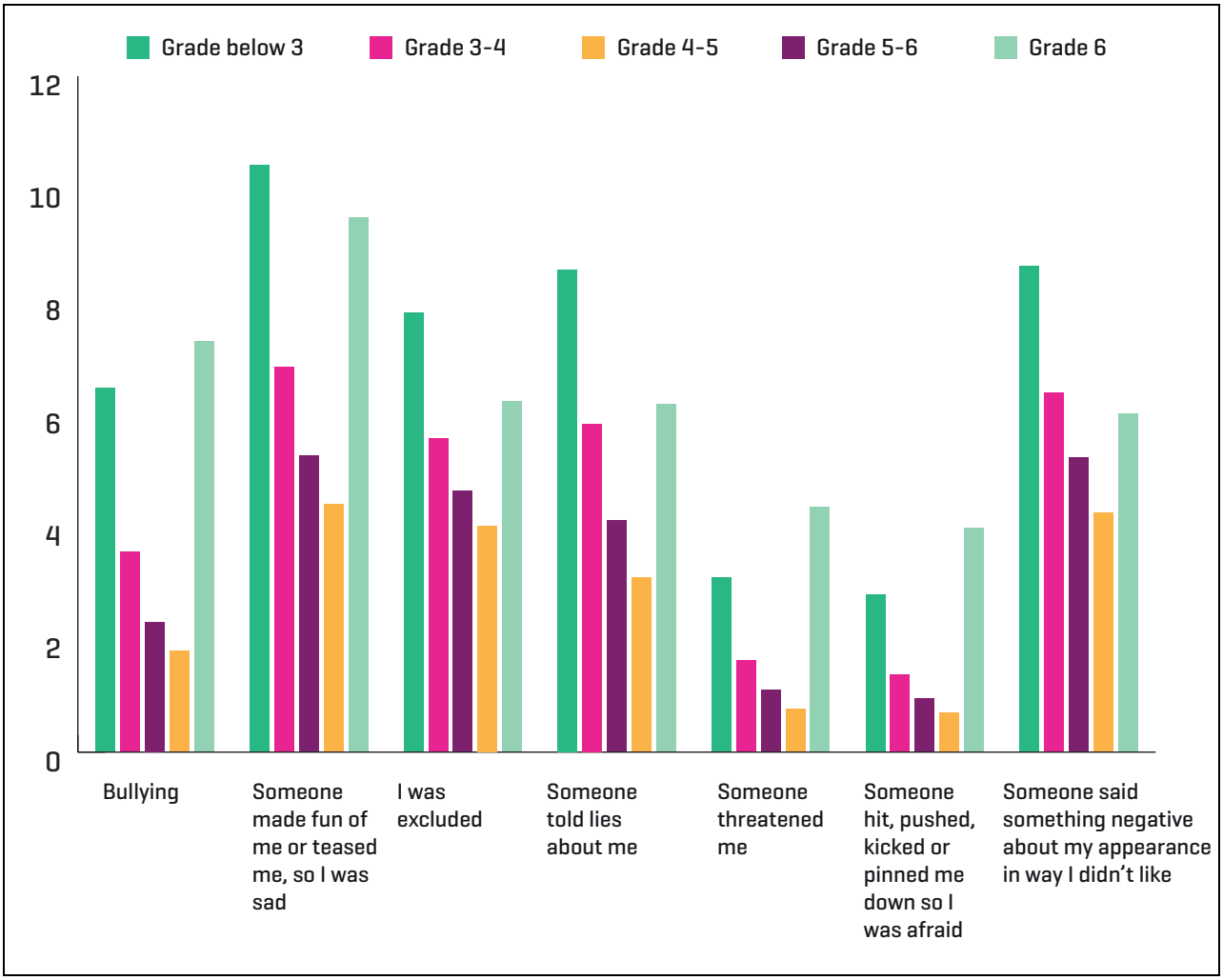



Figure 3.6 Proportion (per cent) of students in 2014 who are bullied and subjected to negative incidents, distributed according to grade categories.

Source: Wendelborg and Caspersen 2016

tern to the same degree when it comes to the link between motivation and results.[31]

Another finding worth noting is that Norwegian students generally have lower stamina in terms of mathematics than the OECD average and the other Nordic countries. Almost 60 per cent of the students respond, for example, that they know the feeling of students who easily give up when working with a difficult task.[32]

### 3.2.3 The students' assessment of the learning environment

Using the Student Survey, Wendelborg and Caspersen (2016) examined how the responses from high achieving students are different from the other students. The results, from 2013 and 2014, provide a description of how high achieving students score on the indices presented in *Skoleporten* (the School Portal), as well as of how they score on key learning environment variables, such as effort, perception of relevance and perception of various types of negative incidents (offences).[33]

To identify high achieving students in the Student Survey, Wendelborg and Caspersen (2016) have used self-reported grades in the subjects of written Norwegian first-form language, mathematics, social science and natural science. High achieving students have the grade 6 in all these subjects. English is excluded because 100 000 fewer students have reported their grade in this

[31] *Ministry of Education and Research* 2016d, Wendelborg and Caspersen 2016

[32] Jensen and Nordtvedt 2013

[33] Wendelborg and Caspersen 2016

subject. Furthermore, grades in physical education and arts and crafts have not been included. The analyses comprise the Student Surveys from 2013 and 2014. In student surveys carried out prior to 2013, it is not possible to identify students who were awarded a 6 in all subjects because the response category was "5 or 6" for the question pertaining to which grade they were awarded in the subject. In 2013 and 2014 the students had the opportunity to respond either "5" or "6". In the Student Survey for 2015, the question about grades has been removed, and thus it is impossible to determine how high achieving students stand out from the other students. The students who are weakest (students with grades under 3 in written Norwegian first-form language, mathematics, social science and natural science) and the students who were strongest in these subjects (the grade 6), are bullied more than students scoring grades of 3 to 5. These students also have the lowest level of well-being in school. They are more vulnerable to be made fun of or teased, to be excluded, to be told lies about, to receive threats and to experience physical attacks. Figure 3.6 shows results per question from 2014.[34]

The results of the analysis also show that the high achieving students do not follow the same pattern to the same degree when it comes to the connection between motivation and results. It also appears that the motivation of high achieving students is affected to a relatively high degree by which class they attend, and that the class has more significance than the school. Hence, the teacher and co-students are the ones who have impact on the student's motivation. There is little change in the numbers from 2013 to 2014. The analysis also shows that the students with high achievements score the lowest of all the students on support from the teacher, and they also score lowest when asked whether they are given adequate academic challenges in school in both 2013 and 2014. The questions connected to the principles in *Assessment for learning* scored significantly higher for high achieving students than for the other students. In 2013 the high achieving students differ substantially from all other students. These results show that students with good achievement results master working with the principles of good formative assessment.[35]

It is important to point out that the Student Survey shows responses from the students. There may be several factors that influence their responses, and the questions only cover some areas. Nonetheless, the Committee finds that the responses reveal the same trends that have been stated in the input and been found in the school visits.

## 3.3 Norwegian teachers' teaching practice

Student results are influenced by the teaching practices of teachers, and it is thus interesting to examine findings that point out the tendencies resulting from teaching practices in Norway compared to other countries.[36] Results from TIMSS Advanced reveal that Norwegian students in upper secondary education score far below the international average on "discussing strategies for problem solving" and on "discussing reasoning". Here there is similarity with the results for both years 4 and 8 in primary and lower secondary education and training, where Norwegian students score lower than the international average on the corresponding question about how often they needed to "explain their answers".[37] This might indicate that two of the most important learning strategies highlighted in articles about developing mathematical understanding – training of skills and discussion about concepts and solution methods – are less used in Norwegian school than in other countries.[38]

The analyses of Norwegian data from the TIMSS Advanced study show that training procedures aiming to make important skills automatic, and discussing and reflecting on answers and problem-solving methods, appear to be treated as less important in Norwegian school than in other countries.[39] Another important finding the Committee would like to point out is that the results from TIMSS and TIMSS Advanced suggest that teaching in Norway appears to have a more unilateral focus on individual ways of working, and this is a stronger focus than in other countries. In Norway, differentiated instruction as individualisation is seen in the same light as individual work, individual guidance and the students' choices, and without plenum teaching.[40] Literature on students with higher learning potential points out the need for individualised guidance and support for this

[34] Wendelborg and Caspersen 2016
[35] Wendelborg and Caspersen 2016
[36] Hattie 2009, Wiliam 2014
[37] Grønmo and Onstad 2009
[38] Grønmo et al. 2014
[39] Grønmo and Onstad 2009
[40] Bachmann and Haug 2006

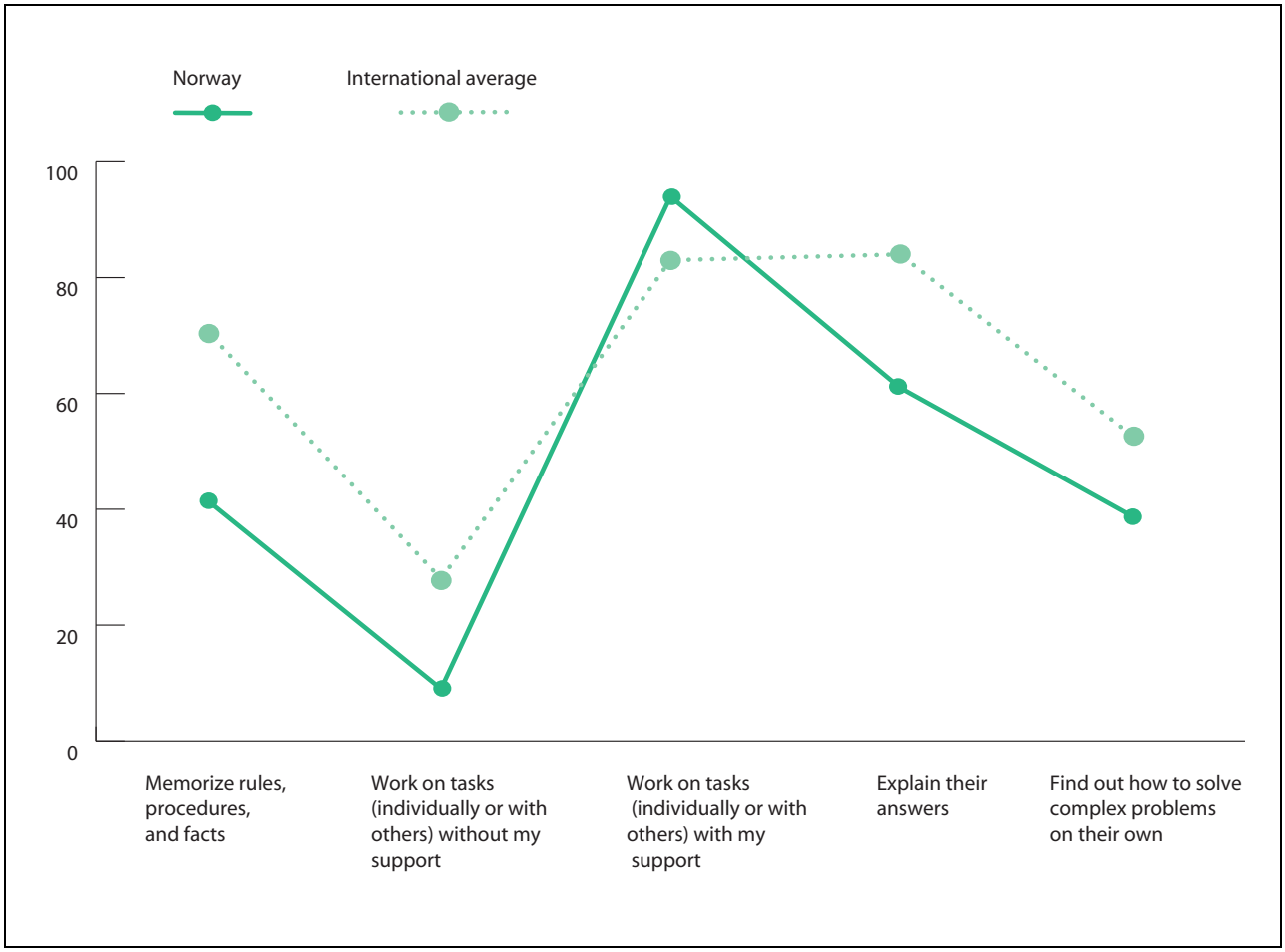



Figure 3.7 The use of different methods in Norway and the international level (average), based on data from TIMSS 2011 in year 8, indicated in per cent of teachers who answer at least half of the teaching periods or more.

Source: Grønmo et al. 2014. The figure has been adjusted.

student group, but this does not mean individual work methods where the students only work on their own. It is also important that the teacher chooses work methods that require the students to cooperate with others.[41] The Committee believes that there is a need for varied forms of teaching which take each student's abilities into consideration, but which also encourage cooperation and discussion. A unilateral focus on individual work where one shies away from other methods, such as class discussion, may detrimentally affect all students, but particularly students with higher learning potential who need teaching which opens for reflection and in-depth learning, as, for example, through problem solving.[42]

Figure 3.7 shows that Norway scores low on methods such as students explaining their answers themselves and finding ways of solving complex problems in mathematics. Teaching methodology literature frequently points out that explaining and arguing in mathematics is a good way of increasing the students' understanding of the subject.[43]

The TALIS survey of 2013 shows that Norwegian teachers claim that they lack the competence to promote their students' metacognition and self-regulation. When asked whether they need more competence in learning techniques that expand the interdisciplinary competence of the students, such as problem-solving and learning to learn, more than half of the teachers responded that they needed competence-raising assistance in this area. The need was greatest on the primary-school level.[44] Another study points out teachers'

41 Gross 2004, Heller et al. 2005, Skogen 2014
42 Grønmo et al. 2014
43 Grønmo et al. 2014
44 Caspersen et al. 2014

lack of competence in how to train strategies for reading proficiency.[45] The TALIS survey of 2013 also shows some interesting findings informing us about how Norwegian teachers assess how they master various aspects of the instruction they give. Self-efficacy is a measure that is often used to ascertain an individual's confidence in his or her own abilities and skills, and appears to be connected to how teachers master classroom management and management of students' learning.[46]

The TALIS survey measures three aspects of self-efficacy: mastering teaching, the ability to involve the students and mastering situations in the classroom. Norway scores relatively low on mastering the instruction. This especially applies to the ability to involve students compared to other countries. Norwegian teachers particularly stand out when it comes to the response to one statement: "I manage to motivate students who display weak interest in schoolwork". Only 39 per cent of Norwegian teachers in lower secondary school believe that they manage to do this generally or fairly well. In comparison, the average proportion for all TALIS countries was as high as 71 per cent, and in Denmark as high as 82 per cent. Knowing that Norway is one of the countries reporting a relatively high number of students with special education needs, this is a result worth noting. Interestingly, it appears that it is in subject areas where students traditionally are not removed from the classroom for remedial teaching that teachers' self-efficacy linked to the learning motivation of their students is lowest.[47] Students with higher learning potential may be in both the upper section of the group of students – high achieving students – and the lower section – low achieving students – because they are not encountering an instruction that motivates them. The fact that teachers respond that they are unable to involve students who are not interested in schoolwork may indicate that more knowledge is needed about teaching methods that can motivate all the students.

## 3.4 Research and experiences from other countries

On the international level, students with higher learning potential have received more attention over the last ten years. In 1994, the European Commission placed this issue on the agenda and urged countries to develop differentiated instruction for students with higher learning potential and adapt the teaching to their development needs within the framework of their own education policy.[48]

At the end of the 1990s, the public authorities in Great Britain introduced a number of initiatives for students with higher learning potential, formulating clear expectations about how schools must provide instruction aimed at these students.[49] Germany, Austria and the German-speaking region of Switzerland have assumed that students with higher learning potential are sufficiently challenged by traditional teaching. It was not until the middle of the 1990s that instruction especially adapted for students with higher learning potential become a political priority in Austria.[50] In Denmark, a working group was convened in 2010 to map and evaluate talent development projects. In 2015, the education authority in Sweden (*Skolverket*) developed resources and guidance material for teachers and educators for "särskilt begåvade" (particularly gifted) children.[51]

An international questionnaire that compares how representatives from different levels of school systems across the world see measures for students with higher learning potential,[52] refers to some common development features in recent years. Many countries have abandoned the idea of categorising students and are rather working to provide learning-stimulating and differentiated instruction in the regular classroom. Environmental factors are highlighted as important for students with higher learning potential.[53]

### 3.4.1 International Research Summary from the Norwegian Knowledge Centre for Education

The Norwegian Knowledge Centre for Education has on assignment for the Committee summarised relevant and recent research from the period 2010 to 2015. The aim of the research summary is to answer the following research question: *What characterises good educational measures for gifted students and students with higher learning*

45 Anmarkrud and Bråten 2012
46 Caspersen et al. 2014
47 Caspersen et al. 2014
48 Børte et al. 2016
49 Bailey et al. 2012
50 Børte et al. 2016
51 Skolverket 2015a
52 The article examines how the terms "talented" and "gifted" are used internationally
53 Freeman et al. 2010

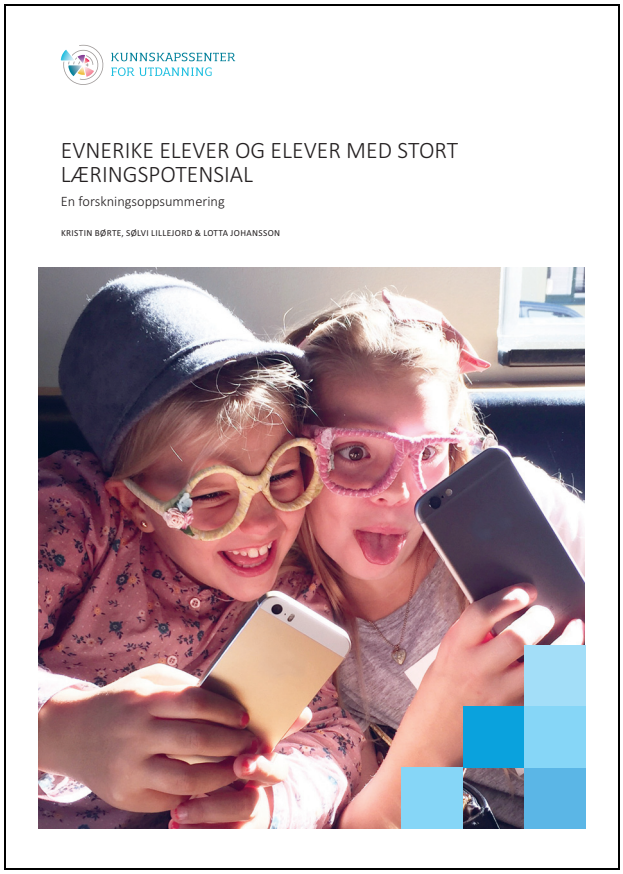



Figure 3.8 Research summary from the Norwegian Knowledge Centre for Education

*potential?*[54] The Committee has not been especially interested in looking at an individual country, but rather in looking at several countries and main trends. The countries mentioned in the summary are primarily those dealt with in the nine included literature reviews. They cover several key themes in the research on gifted students and students with higher learning potential, including how schools may identify students with higher learning potential, characteristics of this heterogeneous group of students and what research shows may be good teaching programmes for these students. The summarised research does not provide the grounds for categorical recommendations as to what teachers should do, but shows requirements for and characteristics of good educational practices for students with higher learning potential.[55]

The research summary refers to four important requirements the education system must address to satisfy the learning and development needs of students with higher learning potential in a good way. These requirements concur with the input the Committee has received, and may be summarised as follows:

- Acknowledgment that students with higher learning potential[56] need supervision
- Cooperation across institutions
- Differentiated instruction
- Flexible infrastructure

In addition to these requirements, the value of quality implementation is also mentioned.

The research summary attaches importance to how the stakeholders on all levels in the Norwegian education system must accept that these requirements translate into responsibilities and obligations for all those with functions in the system. The Committee also points out that expectations must be placed on the various levels, so that all levels can indeed cooperate on creating an excellent learning environment for all students – including those with higher learning potential. Chapter 7 describes this cooperation in more detail.

The first requirement refers to *acknowledging that students with higher learning potential need follow-up,* meaning that they must be identified and their needs must be addressed. Giving these students what they need in the education system requires a uniform system of concepts and a terminology which acknowledges, defines and describes what it means to have higher learning potential, and the diversity represented by this group. The value of having regulations and rules that enable differentiated instruction that can satisfy student needs is also mentioned here. Acknowledging that students with higher learning potential need supervision requires knowledge about them and what they need. The Committee describes the value of identification and acknowledgment in Chapter 5.

The second requirement refers to *cooperation across institutions.* Cooperation between professions and institutions is important when identifying students with higher learning potential and when developing and providing teaching measures for this group of students. The Committee examines the value of cooperation across institutions in Chapter 7.

54 The Committee uses the construct learning potential. See the interpretation of the mandate in 2.6.1

55 Børte et al. 2016

56 The Norwegian Knowledge Centre for Education uses the construct *gifted children* and *students with higher learning potential*

The third requirement refers to *differentiated instruction*. The research summary points out that options must be expanded on the policy and administrative levels so that school owners and individual schools can initiate measures for this student group. The summary shows that many of the studies they included in the literature reviews examine measures that are quite easy to implement within the basic education programme. It describes what characterises good educational measures for students with higher learning potential, and points out some specific organisational, educational, social and learning-promoting measures the Committee has assessed and considered in comparison to the current legal options in the Norwegian context. This will be discussed more in Chapter 6.

The fourth requirement refers to infrastructure which ensures *flexibility in the education pathway from day care, through primary school*, lower secondary school, upper secondary education and to higher education. As the importance of the social aspect is highlighted in the research summary, what occurs in the transitions between the schools, day care-primary school, primary school-lower secondary school, lower secondary school-upper secondary education, becomes a key aspect.

In addition to the four requirements, the research summary also attaches importance to the quality of the implementation. The Committee sees the implementation as structured and ongoing development work in a professional environment. This is described in Chapter 7. The summary also concludes that the need for more research is important, specifically on students with higher learning potential, and that knowledge about them must be linked to the teacher-training institutions. The research summary shows that most teachers do not acquire knowledge about these students through their teacher training or further education and continuing professional development (CPD). Bearing this in mind, the researchers ask whether schools have the necessary competence to deal with students with higher learning potential on their premises.[57]

### 3.4.2 What we can learn from Denmark

The Committee has looked to Denmark, which in 2011 produced a similar report. The work on the report was led by Stefan Hermann, one of the members of the Jøsendal Committee. The Danish talent report reached the following conclusion when it was published in 2011: "A lift in the effort for talented pupils is not only measured on the OECD's ranking lists, but also in the arts and crafts class in primary school".[58] The Jøsendal Committee shares this view. What is needed is differentiated instruction that lifts all students, whatever the subject.

The aim of the Danish working group was both to map and evaluate talent-development projects that were partially funded by the central authorities since 2005 and propose a strategy for talent development across the Danish education system (not including the universities).

The report pointed out that successful talent development is a product of successful professional cooperation (in terms of leadership, organisation, pedagogy, didactics). The working group concluded that there are clear characteristics of what good quality teaching is, including teaching of students with higher learning potential.

In the same way as the Jøsendal Committee, the Danish working group applied a broad definition of learning potential. It covers *what* (talent), *where* (from arts and crafts to natural science) and *why* (well-being, competitiveness and social mobility). The point is that talent is not only a cognitive property, an inherent gift, but also acquired and practical. The working group did not want to look for talent only in the most typical areas, such as languages and mathematics, but also in practical and art subjects, and in interdisciplinary domains. Talent development should also not only be a response to keener global competition and the pressure on the school and education system. It should aim to provide a better school programme for all children. Many gifted and talented children and young people are not given the training and the education that support their learning potential optimally.

The Danish working group saw talent development in Danish education and primary school not only as a question of legislation and rules. Danish school legislation still provides many options, and many other stakeholders than politicians and ministers have great importance for the education of children and youths. Talent development should not primarily be intensified through increased funding. While this may indeed be necessary, more money in itself is not the full answer. In conclusion, it was the view of the Danish working group that improved efforts for talented students most likely depend on more and better research

[57] Børte et al. 2016

[58] Hermann et al. 2011, p. 5

**Box 3.5 Recommendations in the Talent Report – Denmark**

1) The working group recommends that a talent supervisor should be employed in all schools by 2016 so that the school and the teachers have access to expertise readily available in their everyday school affairs, the teaching and the students. This recommendation has not been implemented.
2) A change in teacher training with focus on talent development has been implemented as of 2013. It is now clear that students with special needs are also students with significant potential. A long list of other recommendations relating to teacher training has also been implemented.
3) Establishment of supplementary training and further education and continuing professional development (CPD) and a market for teaching material. Today there are several CPD courses in talent development for teachers. This is by no means a huge development or change, but a number of stakeholders, including non-formal stakeholders, are offering courses and training focusing on talented students. An example of this is *Sciencetalenter* (Science Talents) at the Mærsk Mc-Kinney Møller Science Centre in Sorø (www.sciencetalenter.dk). It is difficult to determine the market for teaching material, but it is found that today more teaching material focusing on talented students is being developed and sold.
4) A stronger academic, strategic and didactic school leadership. The reform of the Danish public school in 2013 has placed a keener focus on improving school leadership. Funding has been allocated for this by the central authorities.
5) Establishment of a national talent centre to compile knowledge about talent development and monitor development in this area. This recommendation has not been implemented in Denmark, and due to this, no one is tracking development or keeping this issue high on the agenda as a national priority.
6) The Danish school reform's goal is that all schools shall challenge students so they reach their full potential, thus emphasis is placed on enabling students to reach their potential.

Source: Stefan Hermann, former head of the Talent Committee in Denmark

knowledge about how to provide better talent development. It is important, however, to point out that the need to find good methods must not be overestimated. Research will probably not be as precise and detailed on actions that this will be a decisive point.[59]

In addition to the talent report, the Committee has looked at another report highlighting measures for "highly gifted children" and which can be considered in the context of what the Committee describes as students with exceptional learning potential.[60] This report, entitled *Indsatser målrettet højt begavede børns faglige udvikling og trivsel [Efforts focusing on highly gifted children's development and well-being]*, highlights such issues as group differentiation and differentiated instruction as important for the students. KORA's[61] analysis, based on interviews with students, researchers, school professionals and local authorities, reviewed a total of 845 Danish and international studies. Of these, only 30 studies were assessed as relevant, and only 11 had the necessary research quality.[62]

### 3.4.3 What we can learn from Finland

Like the other Nordic countries, Finland has a long tradition for linking special measures in education to the responsibility of taking care of the weakest in society. Proposals for measures for gifted and talented students have therefore been rejected as elitist and have to some degree been perceived as counteracting the equality principle. The attitude has been that those with the most

59 The working group for talent development in the education system 2011

60 Two to five per cent of the pupils in all year levels in Norwegian school have what the Committee designates extraordinary learning potential

61 KORA is the Danish abbreviation for "The National Centre for Municipal and Regional Analysis and Research"

62 Mehlbye et al. 2015

resources manage on their own.[63] Even so, Finland has many students who have high achievements in international studies.

The Committee does not draw any conclusions as to why Finland has more students on high and advanced levels in international surveys, but we refer to some central features of the Finnish system. For example, Finland stands out in comparison to other countries because of the high quality of its teachers.[64] Finnish teachers need a five-year master's degree to teach, and this has been the case for more than 40 years. The teaching profession enjoys high status in Finland. This is reflected in the stiff competition for a place in the teacher training institutions, which in addition to high requirements for good grades also includes interviews and admissions testing. In Finland, the best teachers are assigned to the youngest children, which ensures the necessary early intervention, and the students receive extra help and support if they need it. How Finnish teachers work with differentiated instruction may also influence student achievements. A doctoral degree study comparing teacher training in Norway and Finland found that Norwegian teachers focused on group processes and classroom management, while the Finns had stronger focus on individual differences between students, and on how to help each individual child in different ways in the learning process.[65] Since 2007, talent and creativity have been specified as national goals.[66]

Even if students with higher learning potential are not especially mentioned in Finnish governance documents, they are covered by the legislation in force and regulations relating to an inclusive school, where measures have been initiated to satisfy the needs of this student group. Recently, the Finnish school system has become more flexible. There are, for example, opportunities for early school start, advancing a grade, accelerating school and grouping students according to abilities. Schools without grades have also been introduced, parents may choose the school for their children, and the idea of establishing special schools, summer schools and separate education programmes for students with higher learning potential is being discussed.

[63] Børte et al. 2016
[64] Mitchel 2014
[65] Afdal 2012
[66] Børte et al. 2016

### 3.4.4 What we can learn from England and Wales

Talent development was put on the political agenda in England in the mid-90s. The official English policy places requirements on primary schools where they are required to document how they adapt the instruction for students with higher learning potential, using for example a differentiated approach.[67] In England, NACE (National Association for Able Children in Education) has played a crucial role for schools and authorities. After its foundation in 1983, NACE has become recognised nationally and internationally as the leading independent educational organisation in Great Britain when it comes to students with higher learning potential. Using its comprehensive member network, NACE provides guidance, support and training of high quality, which makes it possible for teachers to get the best out of students with higher learning potential in the regular classroom, whilst all students have the opportunity to flourish and achieve good results.

The Committee has had meetings with NACE, represented by professor Joan Freeman and Johanna Raffan, who outlined how the school system in England is turning way from segregation measures and labelling student abilities. Instead, schools are focusing on accommodating the students in the regular classroom using systematic work with progression and in-depth learning.

NACE has also had important input on the schools' work with students with higher learning potential in Wales. The authorities in Wales have established networks of schools, districts and universities to create meeting arenas where solutions can be found on how to differentiate instruction so that students can develop and exploit their learning potential, see Box 3.6.

*Seren* is a network of regional communication centres in Wales aiming to help students with higher learning potential in upper secondary school (most often aged 16 to 18) to achieve their academic potential and be admitted to one of the leading universities.[68]

The Committee's visit to schools in England and Wales showed examples of practices which focus precisely on in-depth learning and progression in a flexible infrastructure.

[67] Hermann et al. 2011
[68] The Welsh Government 2015, input from Y Pant Comprehensive School, Cardiff

**Box 3.6 The Seren network**

- Inspires students and their future aspirations and career wishes – encourages students with higher learning potential in Wales to get the best possible education and make the most out of the opportunities they have.
- Challenges the students in the subjects they enjoy – they attend workshops for specific subjects to expand their subject knowledge and meet a group of like-minded students, who all achieve good results and are passionately interested in their subject.
- Connects students and leading universities in Great Britain, gives the students information about university courses and advice on how to make the best choices. The students are also given information about university summer courses, workshops and other activities that might be of interest across Great Britain. They also have opportunities to interact directly with teachers, tutors and undergraduates.
- Gives practical support and advice – preparing the students for applying to UCAS, attending interviews and assessing universities, and also provides mock interviews with feedback.
- Supports schools and teachers in providing students with higher learning potential with the best possible information, advice and activities.

Source: The Welsh Government 2015, translated by the Committee

## 3.5 Summary and assessment

The analyses from the international studies up to the present show that few Norwegian students achieve on high and advanced levels compared to other countries. The Committee points out, however, that the results referred to do not necessarily reflect the achievement of students with higher learning potential. Nonetheless, the results provide relevant information about the knowledge students have in some given subject areas. We know that Norwegian students have improvement potential in algebra and physics, and that these are areas which have not been given much priority, neither in teacher training nor in mathematics education. The content of the subject curricula helps to determine what teachers focus on in their teaching, and the results show a one-sided approach in terms of teaching methods. This means that arguments and discussions, and training in basic skills tend to have this unilateral focus. The TALIS survey 2013 shows that Norwegian teachers want to have more competence so they can promote the students' metacognition and self-regulation. The Committee asks whether teachers' somewhat unilateral teaching practice and need for competence to promote student learning strategies influences the degree to which many Norwegian students acquire the tools they need to solve tasks on high and advanced levels. The results also show that Norwegian students have the lowest stamina level in mathematics in the Nordic countries, which will influence whether they will reach the highest levels.

The results from the Student Survey show that the students with the highest and lowest grades have a lower degree of well-being than the other students.

The Committee's interpretation is that there may be several reasons why the group of students with best results do not have the same sense of well-being as the students with grades 4 and 5. One possible reason the Committee finds is that they are not given the challenges they need. Not being seen and acknowledged for their strengths will also influence how they are received in the school's social environment. This is consistent with input the Committee has received. The analyses from TIMSS 2011 show that a learning environment characterised by well-being and high expectations for the students influences student results in a positive direction. Input from schools and students confirms that students with higher learning potential may feel left out, have low motivation, and feel that they are not given the challenges they need.

The research summary shows the need for more knowledge about the students, and that they need differentiated instruction that fits their aptitudes and needs. More research is needed on teacher knowledge about and attitudes to students with higher learning potential and on how to ensure good teaching measures for these students.

The Committee recommends that research environments conduct high quality research on students with higher learning potential in close connection and cooperation with teacher training institutions and schools. The national authorities must therefore concentrate their resources on research dedicated to this student group. The Committee believes that critical factors are strong research environments and strong links between research, teacher training and school, which must be strengthened to have an impact on practices in the classroom. The national authorities should ensure that research is coordinated and presented to the sector.

Even if learning occurs in the encounter between teacher and student, it is important to underline that the responsibility for giving students with higher learning potential varied and differentiated instruction belongs to more stakeholders in the education system than just the teacher. This is one of the main points in the research summary, where cooperation between the different levels and stakeholders is seen as a necessary and important factor. The Committee sees the need to clarify the expectations for the various stakeholders in the education system when it comes to providing a better school programme for students with higher learning potential. Input to the Committee reveals the call for more knowledge and competence, including the need for tools and practical advice on teaching practice and differentiated instruction.

# Chapter 4
# Learning for all in an excellent learning environment

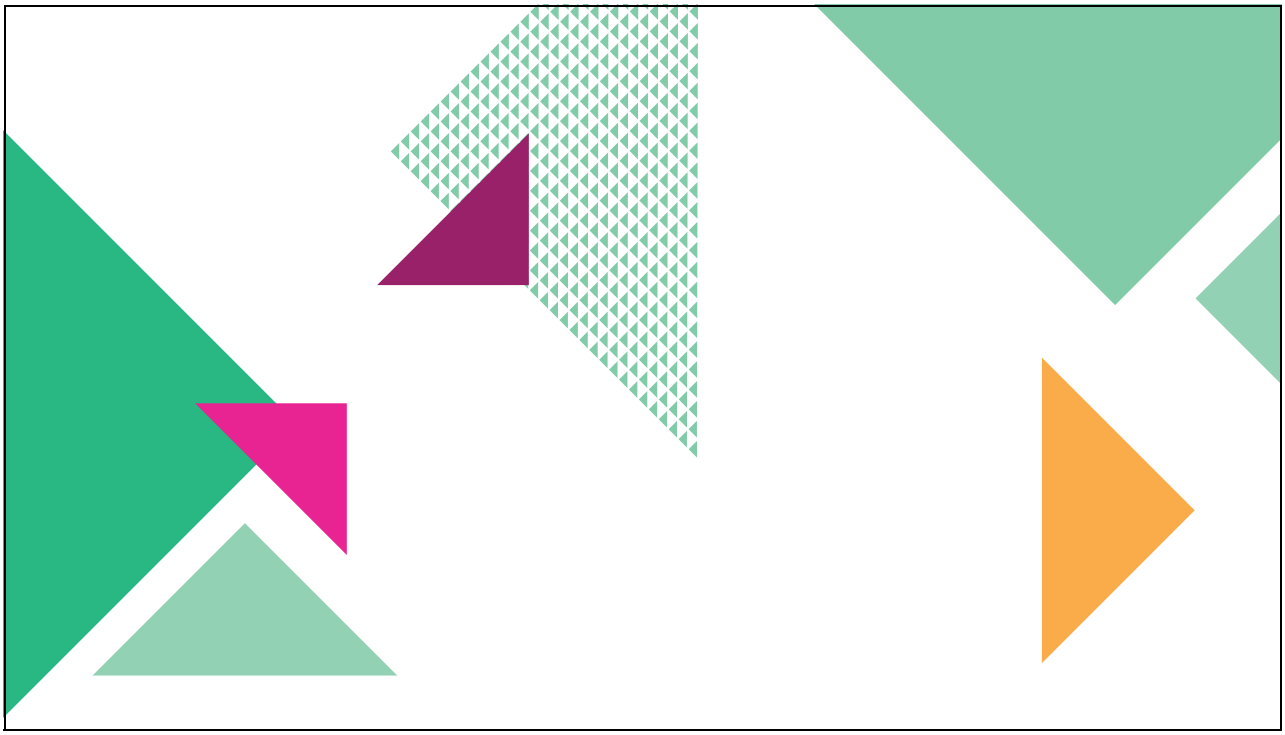


Figure 4.1

> For us, differentiation is about giving all the students challenges on each their level in interaction in the same classroom, in a common class environment.
>
> Input from teachers

This report clearly shows the importance of creating an excellent learning environment for all students, including those with higher learning potential. "Excellent" is used about something that is especially good and has first-rate quality. The Committee believes it is particularly important for students with higher learning potential that the learning environment is challenging but supportive, and that the teachers motivate them and satisfy their learning needs and abilities.

The Committee is aware that the learning environment is in constant development and affected by the people who constitute the learning environment at any point in time. An excellent learning environment is the benchmark that schools must judge themselves by for – virtually a "gold standard" – but it is not a given that everyone will reach this standard. There is a need to develop a common understanding and ownership of the goals and expectations for the work with students' learning. Schools must assess their own practice and status, which means ascertaining strong sides they want to continue building on, and areas they want to develop. This demands a coordinated and concentrated collaboration on some basic principles which first and foremost are realised by teachers and school leaders, but which also require support from school owners, the PPS and other cooperation partners.

"Learning environment" is a concept that is used in many ways in research literature and state programmes. One popular definition is "the environmental factors in school that impact the social and academic learning of the students, as well as their general situation in the everyday school".[1] This definition fits well with how the Committee

considers the concept of learning environment, but we also want to describe some principles and measures schools should focus on if students with higher learning potential are to have a better school programme. An excellent learning environment should be student-focused, consider the variations in the student group, their different ways of learning and individual differentiation needs.[2]

## 4.1 Learning – interaction between inheritance and environment

There are different views on and theories about learning. Many theories focus almost exclusively on the individual and personal cognitive qualities, while others (especially in recent years) have insisted that social and cultural circumstances impact learning the most.[3] The Committee prefers to consider learning from a perspective where inheritance, growth, environment, the individual, cognition and social factors are not only compatible but indivisible. *Plasticity* as a construct and phenomenon illuminates the interaction between individual, identity, inheritance, environment, experience and social circumstances. Empirical studies in brain research have increasingly supported the idea that learning in many ways is manifested between brain cells.[4] Learning may lead to connections between cells being created or broken, reinforced or reduced. Even small changes in this connecting process may impact memory and learning in dramatic ways. Synaptic plasticity refers precisely to this quality of the brain which enables it to continually create new connections and change the balance between existing connections.[5]

Once connections are first established, there is no guarantee that they will remain in place for the rest of a person's life. New experiences, traumas, negative experiences or illness may all contribute to a form of "destructive" plasticity where previously established connections are weakened or disappear, and where the very capacity for activity and plasticity in the brain is reduced.[6] Thus a view of learning as growth based on the fact that everybody can learn and develop their abilities is important.[7] This is also consistent with the international trend which involves moving from a view of the strong abilities of this student group as inherited and stable, to a view where one see the skills of students as influenced by effort and work, and where abilities in themselves may be modified over time by experiences.[8] Moreover, so-called non-cognitive or social and emotional skills, such as stamina, cooperative ability, curiosity and the ability to work with dedication and deal with setbacks can be developed and learnt. These are skills of great importance for students' learning and future social and working life.[9]

One way of understanding the complex interaction between inheritance and environment is to use Renzulli's[10] three-ring model of giftedness, which Mönks[11] later has developed by adding three social areas: *family, peers and school*. This is

**Box 4.1 Finnish teachers' understanding of how students with higher learning potential learn**

A study of what Finnish teachers believe when it comes to whether giftedness is inherent or a property that can be developed showed differing opinions. Some teachers believed that giftedness is something these students "have" – a special form of knowledge, ability and skills, i.e. something they are born with rather than something that can be shaped and developed. Some suggested that it is implied in the name – gifted students have a "gift". When the teachers spoke about giftedness as something that can be developed, they were referring to cognitive functions: The students learn things easily and quickly (take in things quickly), it is "natural" for them, or they do not need to practice, and so on. The teachers described the students as good at problem solving, creative and innovative, able to think new thoughts, enthusiastic, eager to learn, motivated, interested, independent, brave, open and questioning.

Source: Børte et al. 2016

1 NOU 2015: 2 *Å høre til [Belonging]*, p. 32
2 Idsøe 2014a, Sousa 2009
3 Dweck 2006
4 Cook and Bliss 2006, Whitlock and Moser 2009
5 Malabou 2009
6 Gaze and Taylor 1987, Malabou 2009
7 Dweck 2006
8 Freeman et al. 2010
9 OECD 2013
10 Renzulli 2005
11 Mönks 1992

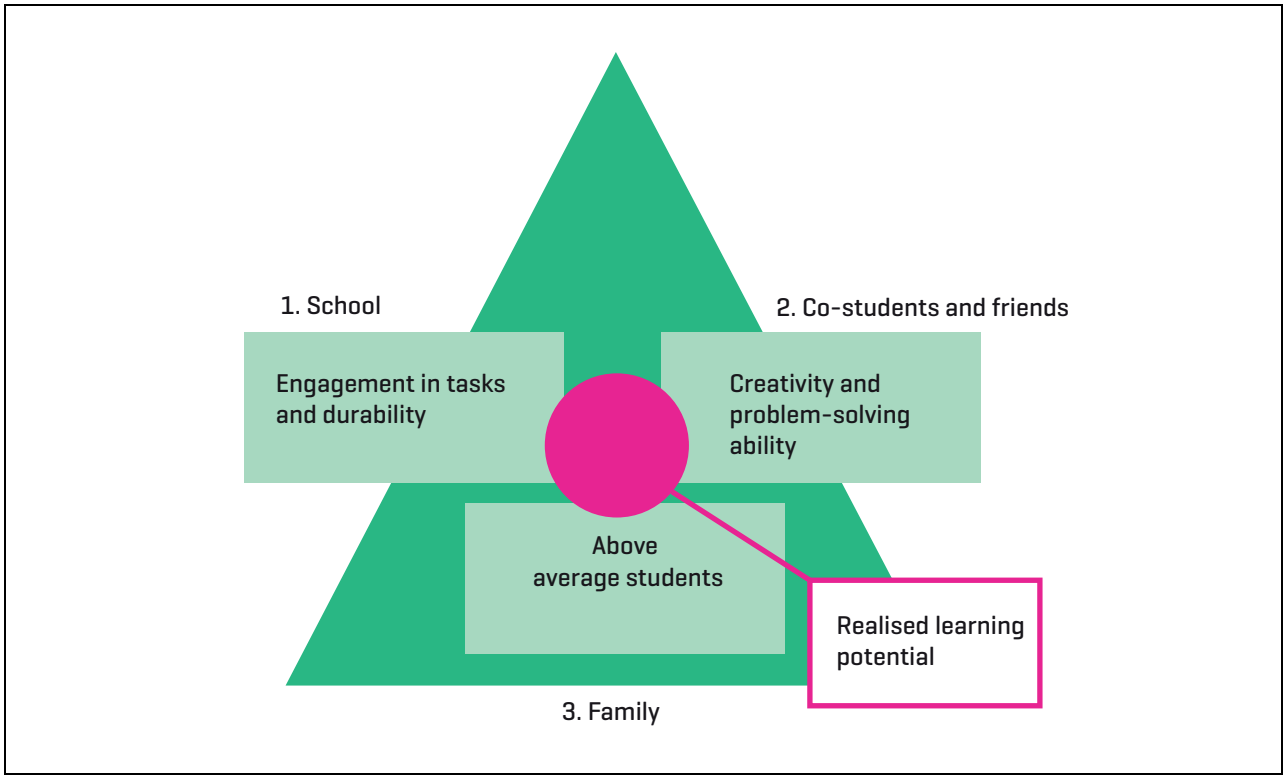



Figure 4.2 Requirements for realising learning potential

The figure is inspired by Skogen and Smedsrud's presentation (2016) of Mönks' multifactor model

called the multifactor model. Only when there is an optimal interaction with follow-up and stimulation between these six factors will students with higher learning potential have the opportunity to develop this potential, which will be expressed as extraordinary achievements in one or more areas.[12] Mönks' multifactor model is presented in Figure 4.2.

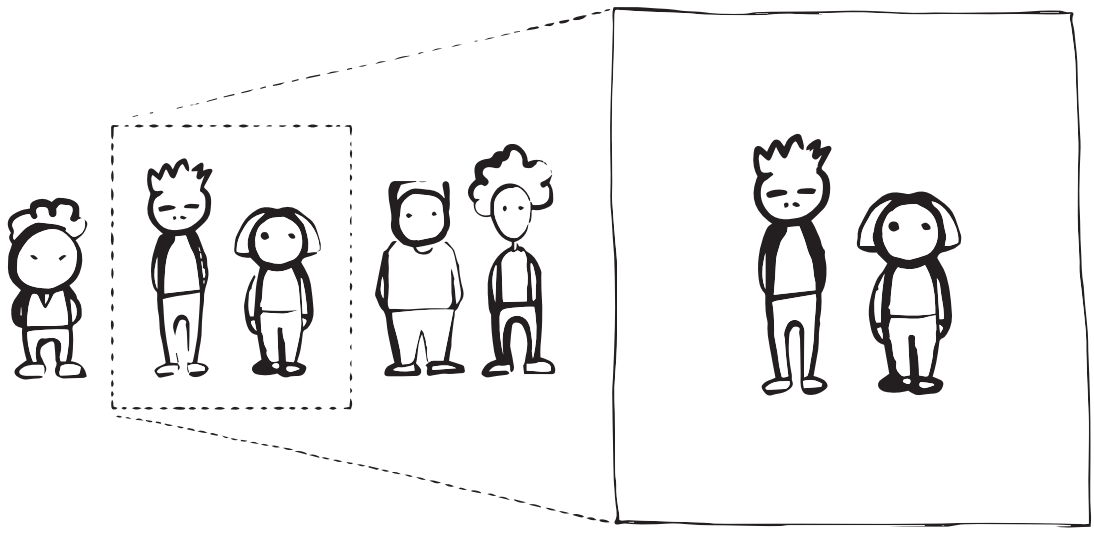
This model can be used to illustrate characteristic features of students with higher learning potential. The first area refers to exceptional abilities. This term means students can typically abstract, adapt to new situations, collect information quickly and accurately and use it in specific subject areas by distinguishing relevant from irrelevant information. Competence in problem solving with advanced use of knowledge and strategies is also highlighted as an important characteristic.[13]

The second area is creativity and the ability to solve problems. Creativity is described as students displaying curiosity, originality, inventiveness and willingness to take risks – and at the same time challenging conventions and traditions. The third area is called task motivation and stamina. Motivation connects to qualities that can be developed, such as stamina, decisiveness, strength of will and positive energy.[14] The three areas shown in this model are consistent with characteristics of students on higher and advanced levels in international studies, such as PISA.[15]

The opportunity students have to develop their learning potential optimally depends on the interaction between the factors featured in this model. A student will have his or her learning potential realised if provided with creative methods and challenging tasks. The surroundings, i.e. the learning environment, will play a decisive role for whether the student will be acknowledged and seen.[16] The Committee therefore wishes to outline some core elements included in what the report calls an excellent learning environment, see Figure 4.3.

Creating an excellent learning environment is not the responsibility of the teachers alone. It requires systematic work with learning on all lev-

12 Børte et al. 2016, Mönks 1992, Renzulli 2005
13 Renzulli 2005
14 Renzulli 2005
15 Nyström 2016
16 Mönks 1992, Renzulli 2005, Skogen and Smedsrud 2016



**Principles of learning for all students**

- → Active involvement and self-regulated learning
- → Relations, communication and cooperation
- → Students' motivation and emotions
- → Students' prior knowledge and interests
- → Challenges so that everyone has something to stretch for
- → Assessment for learning
- → In-depth learning and horizontal connectedness

**Especially important for students with higher learning potential**

- → Identification and acknowledgement
- → Educational differentiation
- → Organisational differentiation

Figure 4.3 Excellent learning environment

els through professional cooperation.[17] The school leaders are responsible for having goals and ambitions, and for creating a good and functional organisation. Good leadership will ensure that the employees have the opportunity to work in a positive and systematic way with the variations in the student group, with their different ways of learning and individual differentiation needs.[18]

Students who are active in their own learning process need teachers, school leaders, school owners (local/county authorities), PPS and homes that cooperate on improving the quality of the instruction. This is described in Chapter 7.

## 4.2 Principles of learning

Students with higher learning potential have different needs and aptitudes which will impact how they learn and how they are motivated. For this reason, the Committee has decided to present seven principles of learning,[19] which constitute the grounds for a good learning environment and good teaching for the learning of *all* students, including those with higher learning potential, see Figure 4.4. Input received by the Committee shows that several of the principles are particularly important for motivating students with higher learning potential, but that it can be

[17] OECD 2013a

[18] Sousa 2009

[19] The principles are based on Dumont and Istance 2010, NOU 2014: 7 *Elevenes læring i fremtidens skole [Pupil learning in the school of the future]*, OECD 2013a

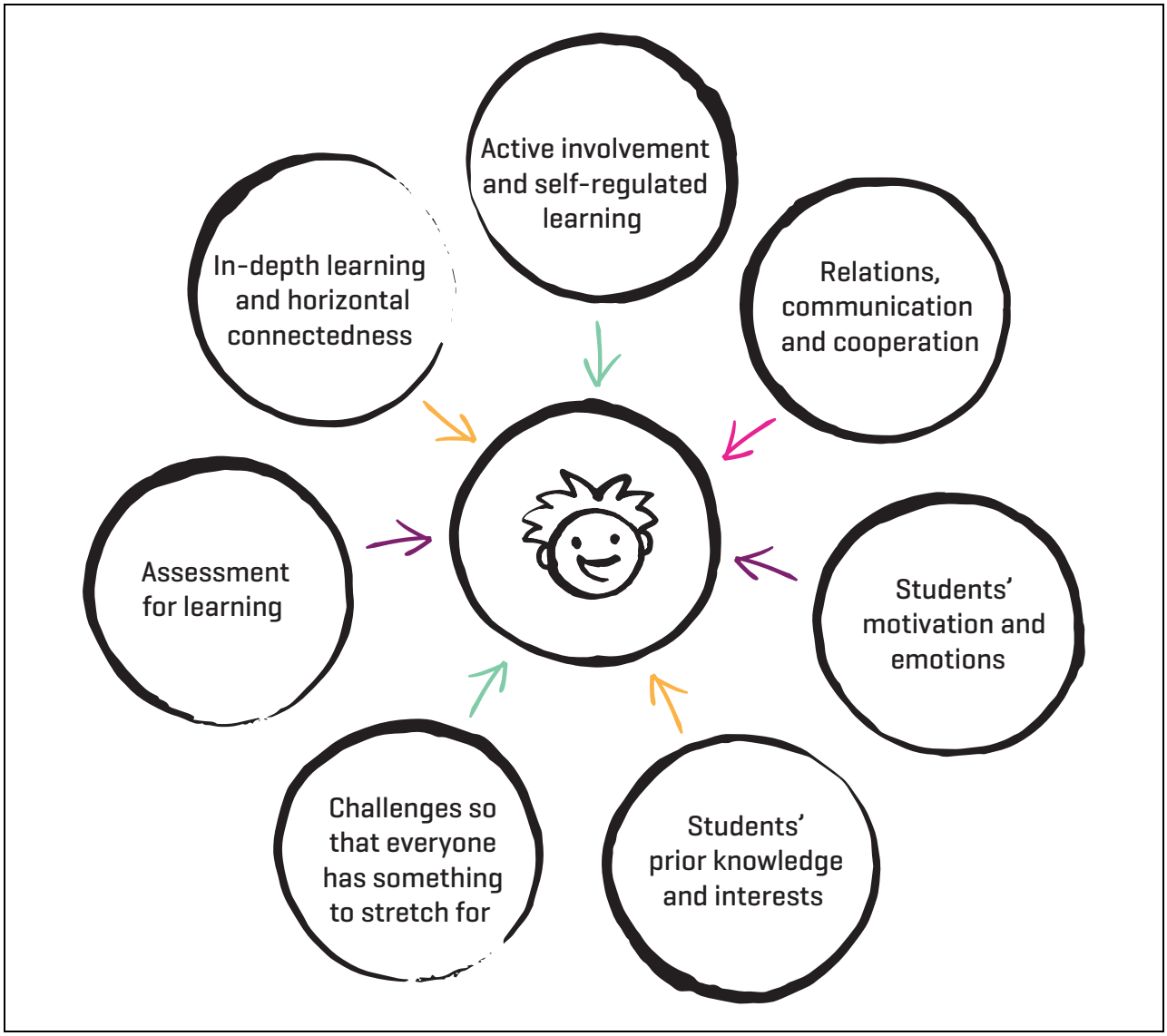



Figure 4.4 Principles of learning

demanding to implement the principles in practice.

Learning is promoted when the school and the teachers see the importance of and systematically work with:

- Learners at the centre (co-participation and self-regulated learning)
- Social nature of learning (relations, communication and cooperation)
- Student's motivation and emotions are integral to learning
- Students' prior knowledge and interests
- Stretching all students
- Assessment for learning
- In-depth and interdisciplinary learning

The Committee points out that in every situation there may be more factors than these which determine whether teaching and learning activities lead to learning for the students. There are examples of student activities, cooperation and feedback that do not promote learning. There are also circumstances that directly counteract learning, for example if the students feel unsafe or are afraid. Following up student progression and development is therefore a key element when working on learning. Methods can have good intentions without necessarily leading to learning and motivation for the students. The seven principles in Figure 4.4 must be considered in relation to each other, but will be influenced in various ways by the learning environment they are a part of.[20] The abilities and needs of the students must also be connected closely to how the schools work with the principles. Knowledge about the characteristics of students with higher learning potential

is thus necessary for positive work with the seven principles of learning for this group of students.

### 4.2.1 Co-participation and self-regulated learning

> We need to learn how to learn, self-regulation, study techniques, learning strategies, this must be learnt earlier – at once. The meaning of learning must be explained so that we can set ourselves goals.
>
> Input from students

Student co-participation is highlighted in the principles of learning, and this means taking part in decisions that refer to learning for each individual and on behalf of the whole group. The students must participate in planning, implementation and assessment of the instruction. How much and how the students participate will vary according to age and development levels, and require knowledge about alternative choices and their possible consequences. The work with the subjects will lead the students in different ways to become acquainted with their own abilities and talents. This will give them a better basis for co-participating and making deliberate choices.[21]

Student co-participation is also one of several principles of good formative assessment.[22] Co-participation in the learning activities, combined with guidance and well-structured instruction, is important for the students' motivation.[23] By involving the students actively in assessment processes, using for example goals and feedback, they will improve in reflecting on their own learning and identifying where they are in their own learning process. Hence, the students do not only become aware of *what* they learn, but also *how* they learn.[24]

Insight into one's own learning and thought processes and skills requires metacognition and self-regulated learning. Metacognition is about monitoring and using knowledge and strategies to regulate thinking and problem solving.[25] Self-regulated learning means that students are able to coordinate, evaluate and optimise knowledge and skill-based factors to reach their learning goals. This includes motivation, knowledge about strategies and one's own thought processes.[26]

Figure 4.5

Metacognition and self-regulation are important for learning and can be developed in interaction with teachers and co-students. By developing metacognition and self-regulation, the students learn to involve themselves in the learning process in a manner consistent with promoting in-depth learning. This may have many positive effects on stamina and on the plans for the work on learning. This may also contribute to strengthening the students' motivation for further learning and give them a positive perception and experience of their own mastering.[27]

An important part of being self-regulated is being aware of different learning strategies and being able to choose appropriate strategies for the tasks the students must solve. Teachers may obtain insight into the students' mental processes by talking with them about how they have approached particular tasks. Such dialogues may give teachers and students alike insight into how the student learns.[28]

Students with higher learning potential often typically have good stamina and are good at prob-

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20 Dumont and Istance 2010, NOU 2014: 7 *Elevenes læring i fremtidens skole [Pupil learning in the school of the future],* OECD 2013a

21 The Quality Framework

22 *Ministry of Education and Research* 2016a, Norwegian Directorate for Education and Training 2016b

23 Jang et al. 2010

24 Black et al. 2006, Gamlem 2015, Hattie and Timperly 2007, Wiliam 2015

25 Brandmo 2014

26 Hopfenbeck 2014

27 Dumont and Istance 2010, NOU 2014: 7 *Elevenes læring i fremtidens skole [Pupil learning in the school of the future]*

28 Hopfenbeck 2014

lem-solving strategies. They have the ability to work with advanced and more creative tasks.[29] Improvisation and repetition may be reasons why students feel that the teaching is boring and not challenging enough.[30] The students need to master the use learning strategies and regulate their own learning to exploit their own potential. If they do not have this knowledge, the students might underachieve. Therefore, students must understand how they learn and what motivates them.[31]

### 4.2.2 Relations, communication and cooperation

> Teachers make a huge difference. A teacher can change everything for a student, your whole life can be changed. Make us suddenly manage things, turn poor patterns into good ones. The effort of a single teacher can make us enjoy school. Teachers are gold in our lives when they are good.
>
> Input from *SkoleProffene*

The word "relation" stems from *relatio,* which refers to the contact between two persons. The quality of the interaction, and thus also the quality of the learning process, is therefore linked to how the student relates to his or her surroundings.[32]

The relationship between teacher and student is often pointed out as the factor having the greatest impact on the learning outcome.[33] Relations are also highlighted as one of the two key competence areas for creating a learning environment of good quality where the students experience well-being and develop academically. The second competence area is being a clear leader.[34] A warm and supportive teacher positively impacts how the students accept each other. This may in turn influence individual student learning outcome. For students with challenges, the quality of the relationship between teacher and student has even more importance. It is important that the students feel their teacher is confident and cares about each of them, and that the instruction supports student involvement, motivation and academic development.[35] School leaders also play an important role by creating a learning environment where teachers feel respected, and where the students experience that the teacher cares about them and their learning.[36]

A lack of or poor relations to teachers may explain the non-completion rate among students with higher learning potential.[37] They need the teachers to accept and understand them. Students state that it is important that the teacher knows his or her students well, and wonders why they do as they do. Many students explain that what school today calls behaviour is actually their way of expressing how they are doing. Therefore, it is vital to have teachers who dare to investigate what underlies the behaviour, and who wants to understand the students. Students with higher learning potential have many ways of displaying or hiding their abilities, and the teacher will discover and understand them better by getting to know the students better. The students want teachers to cooperate with them on good ways of learning.[38]

Some students with higher learning potential may need to meet others of equal minds who think as they do, and who are on the same academic level. Students with higher learning potential do not necessarily have to have friends their own age. A characteristic of many children with higher learning potential[39] in day care is that they enjoy communicating with the adult staff.[40] The fact that students with higher learning potential may need to be with students on a higher level than their age group may at times challenge the social life in the school.[41] Students with few or no friends often have a greater need to feel liked by their teacher.[42]

The Committee finds the cooperation between the home and the school to be an important condition when working on differentiated instruction for students with higher learning potential. Parents may be important in helping to identify the needs the student may have, and how he or she can best be motivated to learn.[43] Schools with good cooperation with parents may gain better understanding of student needs and which academic strengths, challenges and interests may be used constructively in the learning activities. Par-

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29 Nystrøm 2016, Renzulli 2005
30 Børte et al. 2016
31 Siegle 2013, Yang 2005
32 Olsen 2016
33 Hattie 2009, Nordenbo et al. 2008
34 Nordenbo et al. 2008
35 Aasen et al. 2014
36 Robinson 2014
37 Børte et al. 2016
38 Input from *SkoleProffene*
39 The book uses the term *gifted children*
40 Lie 2016
41 Børte et al. 2016
42 Mathisen and Olsen 2016
43 Freeman 1998, Idsøe 2014a

ents may also cooperate with the school by giving courses on various topics, and organising trips and activities that reflect the interests of the students.[44]

The Committee has received much input from parents who feel that their child is not seen in school. They state that only once their child has been examined by the PPS for a learning or behaviour difficulty that the discovery is made that their child has strong cognitive abilities. Then the challenges may have already become quite large and the child may have developed unfortunate patterns that have had consequences for concentration and motivation.

Even though the home has great and important impact on the student's learning, it is important to be aware of the importance of school's input. It has been shown that in schools where the students experience the learning environment as positive, gender, parents' educational background and minority status have less to say for the learning results.[45]

### 4.2.3 Students' motivation and emotions

> If things go slow, it's difficult to keep track, so many of us will tune out. Many of us get tired when we don't get to use our minds properly. If things are too slow, we don't learn anything, because we lose motivation. It quickly becomes boring and frustrating, and that may ruin much of our motivation to learn.
>
> Input from *SkoleProffene*

Most students start school highly motivated to learn. This may particularly apply to students with higher learning potential. To maintain their motivation, the students need varied teaching and challenges, which students with higher learning potential do not always get. They may lose motivation and their interest in school, which may then have serious consequences.[46]

The importance of motivation for realising a student's learning potential is underlined in Report to the Storting no. 22 (2010–2011): "If students are to exploit their full potential for learning in school, it is decisive that they are willing and able to make an effort, and to use the resources that are available to them. Thus, the students' motivation for learning is quite decisive for their learning outcome. Motivation for learning can be defined as the motivation power behind efforts for learning".[47]

It is customary to distinguish between internal and external motivation. Internal motivation refers to the student's interest in and desire to work with the school subjects. In contrast to external motivation, internal motivation is a driving force behind behaviour the individual wishes to express, even if it does not lead to any external reward or external consequences. When students have internal motivation, their action will be free from pressure, completely self-determined and raise competence. The activity, satisfactory in itself, is not influenced by what others will think of the performance, or the kind of reward that awaits when the task has been completed.[48]

Sports psychologists and coaches have considered requirements for good performance more than educational researchers, and they point to strength of will, stamina, impulse control and self-control as important capacities for exploiting one's own potential. These qualities are not constant and can be developed and learnt through training and guidance.[49] In the sports environment, the following factors are viewed as important for developing good performances:

- Having a concrete and easily understandable goal
- Being able to maintain focus on this goal over time
- Having a high level of self-discipline[50]

A requirement for realising these three factors is a high level of willpower and motivation which is continuously trained with the help of a coach. The first factor is having a concrete understanding of the desired goal. Furthermore, the performer must want to attain the goal, whether this is a football player or a student. Just as important as a good understanding of the main goal itself, is the development of sub-goals or targets the student can work towards, and where the student has the ability to assess goal satisfaction with the teacher or on his or her own.[51]

The second factor in this context is focus and stamina. In addition to being able to present strategies and basic knowledge, the teacher must be able to impart the importance of stamina and

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44 Clark 2012
45 Bakken 2010
46 Børte et al. 2016
47 Report to the Storting no. 22 (2010–2011), p. 13
48 Pintrich and Schunk 2002
49 Skogen 2014, Skogen and Smedsrud 2016
50 Fiskerstrand and Rimeslåtten 2009
51 Olsen and Skogen 2014

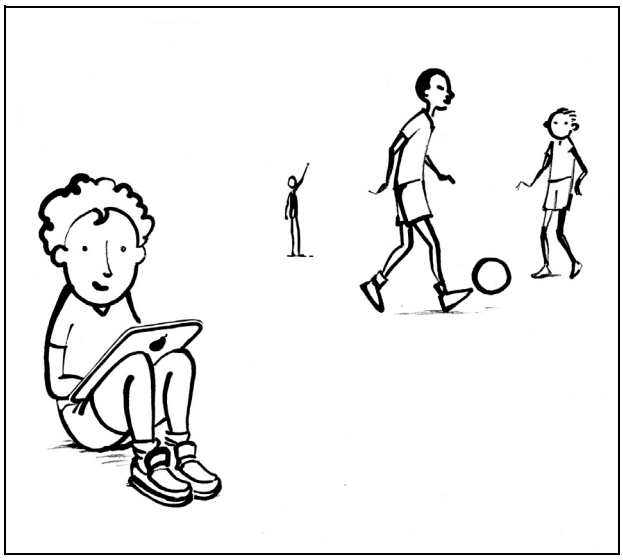

Figure 4.6

reward it. One of the main differences between students with high achievements and those who achieve on lower levels is the ability to never give up, but rather continue by trying new and more creative approaches until the task has been solved. Eventually, the joy of solving a problem will be sufficient reward, but along the way, the teacher must reward stamina and the student's work by defining and redefining the task itself.[52]

Willpower is a key factor in explaining self-control and impulse control. Self-control refers, for example, to how we manage to defer what we want to have here and now so we can achieve a reward in the future. Children who are struggling with their self-control in concrete situations may succeed if they have good strategies.[53] Impulse control is very important for the exercise of self-control. Our impulses are the worst enemy of self-control, hence good impulse control is the first commandment for attaining good performance – regardless of what we are doing. Today many students have their focus interrupted due to frequent access to digital media, both at home and in school. In addition to such qualities as willpower and self-control, which are important for attaining good performance, the students' idea of how they learn is also an important factor.[54]

Several studies have pointed out that students with higher learning potential have higher internal motivation than other students.[55] This fact notwithstanding, several of these students underachieve because they find that they are not academically included, or are not given the academic challenges they need. This may have consequences for their motivation.[56] A learning environment that focuses on drawing on the interests of the students, and where they work well on learning objectives, will strengthen motivation and the wish to learn for students with higher learning potential who underachieve.[57]

### 4.2.4 Students' prior knowledge and interests

> I was sitting a long time and working a bit chaotically with things that interested me in mathematics classes, because I often knew already what we were learning in class, but now when things are much more differentiated, I'm able to work logically towards a goal, which I think makes me learn more quickly than sitting and browsing through a book on my own.
>
> Input from a student

The Norwegian comprehensive school has endeavoured to provide equal opportunities for all. The Committee asks whether this has prevented many students from receiving precisely what they need, because all children are different and have different needs and abilities. The individual differences are a complex interaction between sociocultural and personal factors. Sociocultural factors include parents' socio-economic status, educational background and aspects of the early-development and learning environment students have at home and in school. Personal factors include prior knowledge, learning strategies, motivation, the appetite to learn and ideas about one's own learning ability.[58] These factors can also contribute to creating a learning culture with positive attitudes to learning. Analyses of PISA results in reading skills from 2009 indicate that few students experience that the teacher gives them support to link the content of the texts they read to prior knowledge and experiences. Nor do they experience that the teacher recommends books or authors they should read.[59]

Some students with higher learning potential may find that they have interests the school does

52 Olsen and Skogen 2014
53 Hopfenbeck 2014
54 Olsen and Skogen 2014
55 Feldhusen et al. 2000, Gottfried and Gottfried 1996
56 McCoach and Siegle 2008, Siegle et al. 2013
57 Moon 2012
58 NOU 2015: 8 *Fremtidens skole [The school of the future]*, p. 34
59 Hopfenbeck and Roe 2010

not address in a way that motivates them. Connecting their experiences and areas of interest to the work with school subjects is therefore important and may contribute to strengthening motivation and acknowledging them.[60] In the report, *Det tenner en gnist! [Lighting a spark!]* Dælien and Eriksen (2015) have studied the effect the elective subjects have for young people's motivation. The report states that the electives appear to contribute to increased motivation for school, and that this may "light a spark". Many students find the tasks in the electives motivating, and for some students there are similarities between the elective and their own extracurricular interests. Good well-being in the elective subjects is linked to the fact that they are practical, thus different from the regular class.[61] For students with higher learning potential who may have interests not shared by all the others in the class, it will be particularly important to have the possibility of including personal interests in the instruction. The electives may be one way of doing this, but the Committee has also seen examples of schools which cooperate with the SFO (school day care/after-school programme) on clubs that offer activities in various areas of interest for students at school.

### 4.2.5 Stretching all students

> In the math class the teacher can for example give us a book with math puzzles and problem solving, instead of just giving us the book for the next school year. Or we could be asked to make a task that would challenge the teacher.
>
> Input from *SkoleProffene*

A number of studies show that being challenged to perform just above one's capacity and current level is decisive for learning.[62] This agrees with Vygotsky's concept of the zone of proximal development, which represents the skills the child has not yet developed, and means that the child is in a maturing process. In these processes the child may be helped by the teacher's guidance and support. Work with tasks in the zone of proximal development can expand the student's competence, and move the zone's boundaries. This means that student should not work with what he or she already masters, but rather with what he or she almost masters. The students must have something to stretch for.[63]

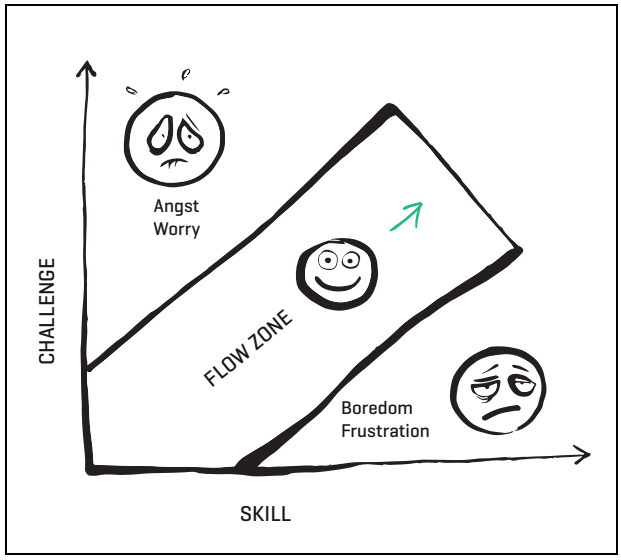


Figure 4.7 Flow zone

Vygotsky's zone of proximal development may be considered in conjunction with the theory of flow[64], which is based on the importance of concentrating learning in the student's flow zone, see Figure 4.7. The learning flow lies in a zone where challenges are balanced against the students' skill. If the skills are good but the challenges small, as we often see in students with higher learning potential, this may lead to boredom and frustration. On the other hand, the challenges may also exceed the student's skills. This may lead the student to experience anxiety and worry. The challenge for the teachers is to be familiar with the knowledge levels of the students and promote competence and learning so that each student is moving in his or her flow zone.[65] It is also important that teaching should creatively open for drawing in the personal interests of the students.[66]

Students with higher learning potential may "drop out" if the teaching is perceived as trivial.[67] Therefore the students always need new challenges. Academic challenges for this group of students does not mean that they must read an extra book, but that they are challenged to learn in other and more creative ways, for example by solving problems and working on more indepen-

60 Clark 2012
61 Dælien and Eriksen 2015
62 Greeno 2006
63 Vygotsky 1996
64 Csikszentmihaly 1996
65 Olsen and Skogen 2015
66 Csikszentmihaly 1996
67 Børte et al. 2016

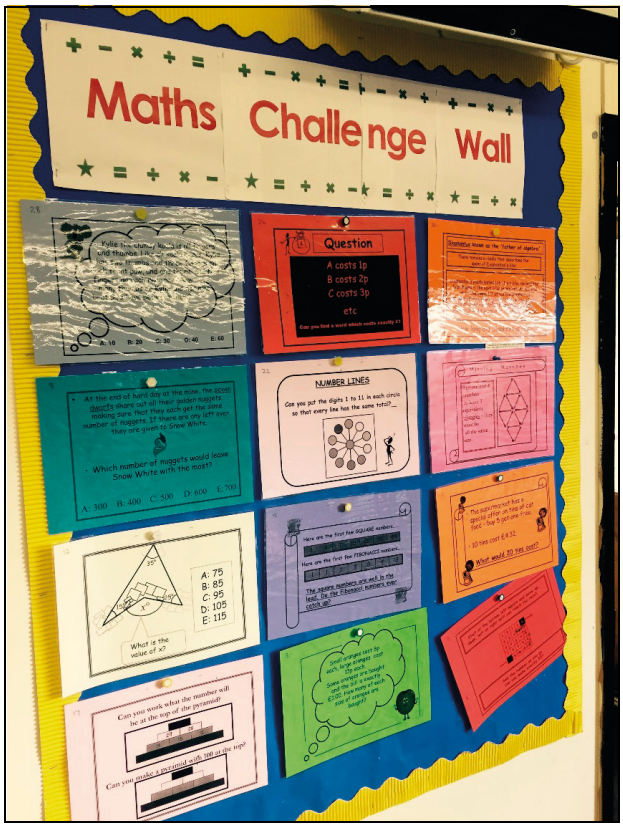


Figure 4.8 In Y Pant Comprehensive School in Cardiff, the teachers are working in different ways to give their students academic challenges. Here is an example from mathematics in lower secondary school where the students may choose tasks themselves.

Photo: The secretariat

dent reading of the subject matter. More of the same is not a good way of being challenged.[68]

The analysis of the Student Survey from 2013 and 2014 indicates that several students on high levels are not given the academic challenges they need. They score low on the question relating to whether they are given sufficient academic challenges in school that covers both years. These responses only represent students who state that they achieve at a high level. Students with unexploited potential will not necessarily appear here. Nevertheless, this gives some indication that many students could have exploited their learning potential better if they were given greater academic challenges and more varied instruction.

This is consistent with analyses which show that schools that have developed a good learning environment also contribute to levelling out social differences. These analyses seem to suggest that schools that place high academic expectations on their students have weaker connections between student results and social background, but these findings are not as clear if several studies are collated.[69]

### 4.2.6 Assessment for learning

> The teacher has to give feedback on how to develop even if I get a [top grade] 6! It's no fun to get: "Great, carry on the good work". The teachers look more at the grades than what we have learnt to get a [top grade] 6, or how we may make progress.
>
> Input from a student

Assessment for learning means that the teacher uses information about a student's progression and development to involve him or her in his or her own learning process. Using clear goals, relevant feedback in the subject and self-assessment, the students will become aware of their own strengths and what they need to work on more. Systematic use of formative assessment may also help the teacher to see progression and development, which forms the basis for giving the students academic challenges that are adapted to their abilities and aptitudes.[70]

Students with higher learning potential have considerable need for individual guidance where goals, feedback and self-reflection are in focus.[71] The principles of formative assessment are thus very important in the efforts to provide differentiated instruction for students with higher learning potential. Several of the schools the Committee has visited which are concerned with differentiating the instruction for students with higher learning potential are working systematically with assessment for learning. This may indicate that the principles can be used to give both students and the teacher insight into where the students are and their learning potential. The analysis of the Student Survey 2013 and 2014 showed that students with good results master working with the principles of good formative assessment.[72]

Evaluations from the project *Forskning på individuell vurdering i skolen (FIVIS) [Research on*

68 Idsøe 2014a, Skogen and Smedsrud 2016

69 Bakken 2014

70 Black et al. 2006, Wiliam 2015

71 Gross 2004, Heller et al. 2005, Skogen 2014, Skogen and Smedsrud 2016

72 Wendelborg and Caspersen 2016

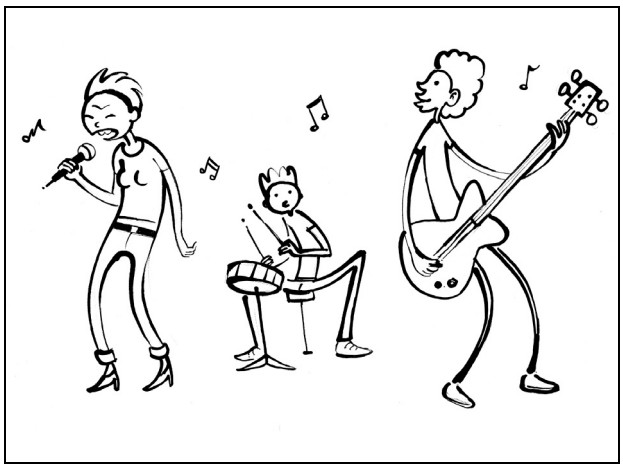

Figure 4.9

*individual assessment in school]*[73] indicate that there are challenges when it comes to instantiating the competence objectives. In many contexts, the instantiation of the goals may have made the competence objectives less visible for the teacher, and not least for the students. This in turn has consequences for what type of feedback the students are given, and the type of content they acquire.[74] For students with higher learning potential who need to work in more creative and in-depth ways, it will be particularly important that the goals and feedback reflect their potential and performance and that they are not too specific. Using students' interests in the work with goals in the teaching is also important for the motivation of this group of students.[75]

The Committee finds that it is necessary to provide the opportunity to follow progression on high and advanced levels in the subjects in question. The Report to the Storting 28 (2015–2016) recommends that the progression in the subject curricula is made clear by developing guiding descriptors for the students' learning pathways in the subjects. The proposed progression descriptors in the guides for the subject curricula shall support the teachers' work to differentiate the instruction for individual students and groups of students. The Committee is in favour of this and considers it necessary to follow up all students in a better way, including those on high and advanced levels.

The Committee has not assessed whether the current grade scale has been sufficiently developed to describe competence on an advanced level. Whether this is a relevant aspect to include in the renewal of the Knowledge Promotion curriculum is a question left to those in charge of that work.

### 4.2.7 In-depth learning and interdisciplinary work

> Many of us have heard the teacher say that we mustn't go so fast, then it becomes so boring when the rest of the class has to work on learning what we already know. But we don't always need to skip to the next stage. We could do tasks in some other way. Specialise, go in-depth into something. Add some questions, make the tasks a bit more complicated, be more creative! They could let us use other sources than the textbook.
>
> Input from *SkoleProffene*

Working in-depth through enrichment is an important measure for students with higher learning potential.

*Enrichment* of the regular instruction is a measure that can be implemented within the classroom framework. Briefly put, this means expanding or elaborating on the subject matter.[76] Enrichment refers to giving the students the opportunity to learn in-depth, but also more broadly, for example by working with topic areas or in an interdisciplinary way.[77] In-depth study means the students are allowed to study and work with the subject matter over time, and that they receive feedback and challenges that keep pace with their development in the subject. It is also important for the learning that the students reflect on their own learning and are given help to understand how things hang together.[78] Surface learning, in contrast to in-depth learning, means learning facts without putting the knowledge into a context.[79] For students with higher learning potential, it might be constructive if they are encouraged to work in-depth so that they can acquire competence relating to learning more independently and are more able to regulate their own work.[80]

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73 *FIVIS* is the Norwegian abbreviation for research on individual assessment in school. This was a cooperative project between the Norwegian University of Science and Technology and SINTEF on assignment from the Norwegian Directorate for Education and Training

74 Sandvik and Buland 2014

75 Gross 2004

76 Idsøe 2014a, Renzulli 2005, Skogen and Smedsrud 2016

77 Renzulli 2005

78 Skogen and Smedsrud 2016

79 Report to the Storting 28 (2015–2016)

80 Renzulli 2005

The importance of interdisciplinary work has been given special focus in NOU 2015: 8 *Fremtidens skole* [The school of the future], and is being followed up by a renewal of the subject curricula in Report to the Storting no. 28 (2015–2016). The teaching should stimulate competence and insight into topics across subject areas, and the students should work with issues or topics that require knowledge and skills from several subjects. Making this type of interdisciplinary work more visible may be a way to ensure students' in-depth learning.[81] The Committee finds it positive for students with higher learning potential that in-depth and interdisciplinary learning are considered to be a key part of the subject renewal, precisely because these students may benefit a great deal from working with enrichment in subjects.[82]

We point out that less comprehensive subjects should not become synonymous with subject curricula with more restrictive competence objectives which lessen the opportunities for students with higher learning potential to work in-depth and over a broad scale, or narrow topics or the diversity of content.

The OECD report *Art for Art's Sake?*[83] points out that instruction in art subjects puts focus on and stimulates both cognitive and non-cognitive knowledge and skills in students. This can help to improve students' holistic development and competence. This does not only apply to interdisciplinary work, but also to method transfer. What motivates students in one subject may also be motivating in other subjects. The report also shows that students actively engaged in music and other art disciplines show higher ambitions and achievements in other subjects. This also applies to students actively engaged in sports.[84] In Denmark, in-depth studies were highlighted in connection with the *Folkeskolereformen* [Reform of primary and lower secondary school] in 2014, see Box 4.2.[85]

## 4.3 Summary and assessment

Based on research, input and experiences, the Committee finds that schools and teachers need more knowledge about what promotes learning for all students, and what students with higher learning potential require. International studies, such as the PISA surveys, show that students who achieve on high levels often have more stamina for task solving and better results in problem solving than students on lower levels. They need to have a learning environment that gives them the opportunity to develop these capacities and improve their achievements. The Committee believes that it is important that students with higher learning potential encounter a teaching practice that motivates them through the provision of challenging and creative tasks. In sports environments, concrete and understandable goals, focus on goals over time and a high level of self-control are seen as important ways of achieving good results. We believe that this is also particularly important for students with higher learning potential.

The fact that Norway has few students achieving on high and advanced levels suggests that there is a need to work on providing learning situations that promote student motivation for learning, and strengthen their self-regulated learning. Principles of good formative assessment may be useful in this work and may help the students to learn more about their own strengths and challenges. We believe there is a need to examine more closely how principles of good formative assessment may be linked to individual guidance for students with higher learning potential. If the students are to encounter challenges and work in-depth in their subjects, it is necessary to think flexibly and innovatively about educational methods and organisation of groups.

81 NOU 2015: 8. *Fremtidens skole [The school of the future]*
82 Idsøe 2014a, Renzulli 2005
83 Winner et al. 2013
84 Winner et al. 2013
85 Ministry for Children, Education and Gender Equality 2016

**Box 4.2 In-depth learning and interdisciplinary work in Denmark**

Teaching in the Danish "folkeskole" (primary and lower secondary school) must be differentiated so that its point of departure is the individual student's abilities and relevant development stages, and shall aim for what each student can achieve. This also applies to students with higher learning potential, who must be challenged and achieve even higher (In Denmark the term *particularly gifted children is used*.) Supportive instruction, found in section 16a of the *Folkeskolelov* [Act relating to primary and lower secondary school], shall provide the students with the opportunity to have in-depth studies in subjects and to work broadly with their abilities and interests.

Supportive teaching refers to learning activities that go beyond the regular subjects and topics of the primary and lower secondary school. It should create variation in everyday school and give academic challenges and opportunities for differentiation so that the instruction fits each student.

The activities in supportive teaching shall:

- support instruction in the subjects and/or
- strengthen the students personally through learning to learn, through social competence, versatile development, motivation and well-being.

In the supportive teaching, the students will be able to try out, train and develop skills and competences using activities such as reading training, mathematics exercises, homework assistance and in-depth studies. Student council activities, student performance review dialogues, movement and cooperation with the local sports, culture and association/club life and other activities which support the versatile development and motivation of the students may also be included in supportive teaching.

Source: Danish Ministry for Children, Education and Gender Equality 2016, translated by the Committee

# Chapter 5
# The most important aspects for students with higher learning potential

Figure 5.1

> If you look around you, you cover 360 degrees. I think that means that there are at least 360 ways of looking at a task or topic. The teachers must exploit this to give us challenges.
>
> Input from *SkoleProffene*

This chapter presents some educational initiatives that the knowledge base shows may be important for students with higher learning potential: *identification and acknowledgement* of students' learning potential and *educational* and *organisational differentiation*, see Figure 5.2. The Committee points out that the initiatives here are also highly important for the rest of the student group.[1] The measures must be considered in connection with each other, and the aim is that students should feel more included in subjects, on the social, cultural and organisational levels[2] in the learning environment they are participating in. The Committee believes that the implementation of all the measures presented here is viable within the regular instruction.

School's organisational framework, teaching practice and educational tools are interdependent factors in the development and implementation of teaching measures for the students.[3] It is also important that such social factors as group dynamics in the class and the learning culture are considered when planning instruction for this group. Organisational and structural choices will affect how school can implement pedagogical measures.[4] Organisational measures, such as skipping years in school, are described in Chapter 6.

1 Bailey et al. 2008, Børte et al. 2016

2 Cf. the inclusion dimensions described in 2.6.4

3 Børte et al. 2016

4 Børte et al. 2016

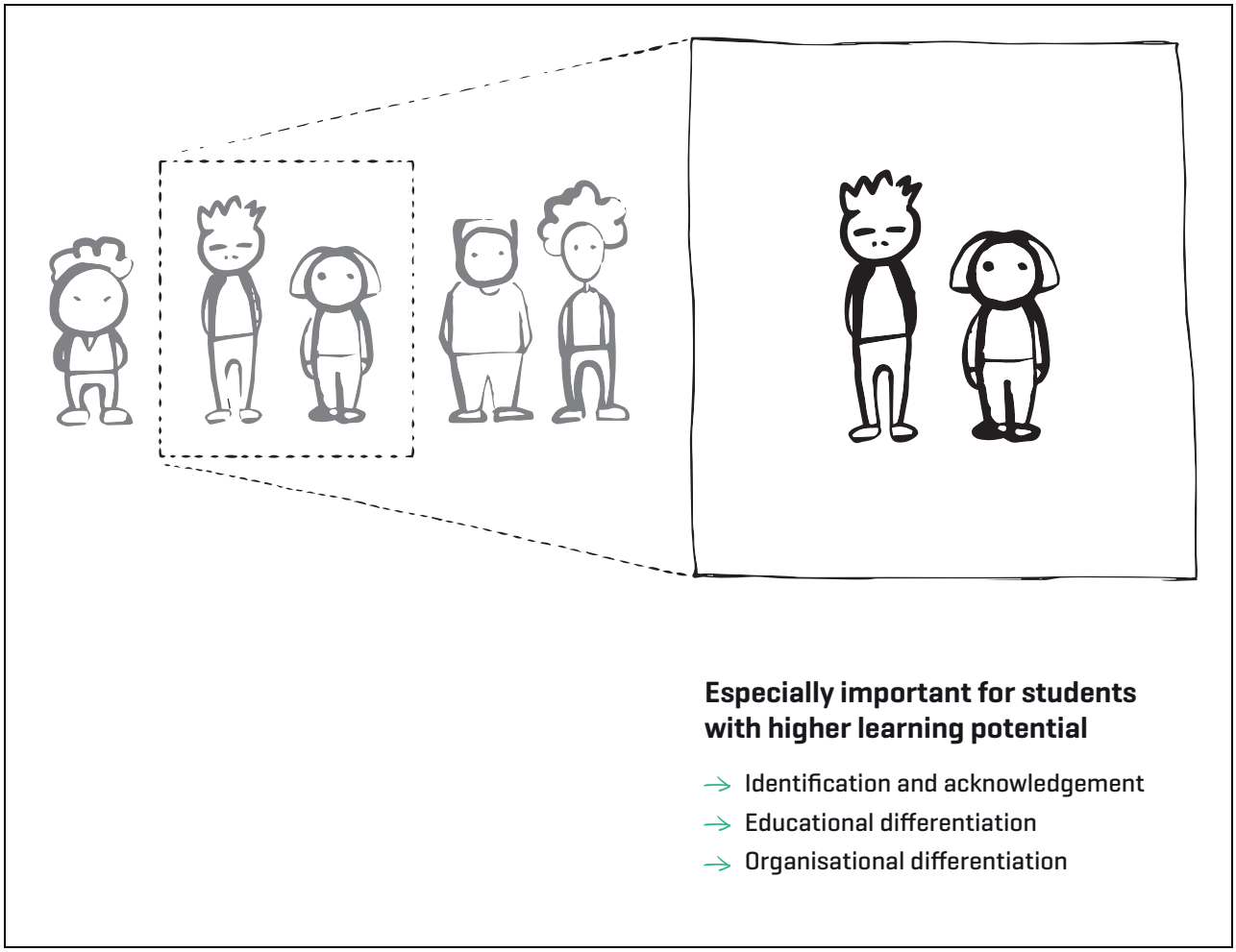


Figure 5.2 The most important aspects for students with higher learning potential

## 5.1 Identification and acknowledgment

> As students and school pros, we want teachers who are curious about us, and want us to do well. It is not always easy to discover that we are gifted, and then it would have helped if the teacher had known something about being gifted.
>
> Input from *SkoleProffene*

Before the national authorities, school owners, school leaders and teachers plan and initiate measures for students with higher learning potential, the students must be identified and acknowledged as such. Without this basic competence, random measures will have little effect. Identification requires research-based knowledge about the students' needs, and about what characterises their challenges and strengths.[5]

In the European countries it is common to use mapping tests to assess school performance and students' abilities, in addition to grades and other forms of school achievement. In addition to this, psychological tests (intelligence tests) and educational-psychological tests (linked to school performance) are used. In some countries (for example Sweden, France, Poland and England), a nomination system is also used – by teachers, parents and peers, or self-nomination. Interviews are also conducted, with parents and the student, often with an expert present. In Germany, students are identified through competitions in and outside of school. Identifying students with higher learning potential is a complex process, and often various methods are combined to achieve this. Various difficulties a student may have can make the identification process extra challenging, and often the students are not identified at all.[6]

[5] Børte et al. 2016
[6] Børte et al. 2016

As the situation is in Norway today, students are tested to exclude or find signs of difficulties or challenges, such as ADHD, ADD or autism. One researcher, Ella Idsøe, has stated in an interview in connection with the Bærum Schools project (municipality close to Oslo) and their efforts for gifted students, that Norway, in much the same way as the other Scandinavian countries, looks for students' problems, forgetting to see that they also have abilities and resources. In Norway, there is little acceptance or tradition for mapping abilities or potential, and for this reason there are fewer and poorer tools than in other countries that have developed special identification tools.[7] Identification covers more territory than only using mapping tests. Students with higher learning potential constitute a diverse group with a multitude of strengths and challenges. It is therefore necessary to have a perspective on the identification process which includes the emotional, academic, social, physical and mental needs of the students. Here are some examples of relevant sources that may be applied, and which should be considered in context:

1. Results indicating something about the student's knowledge level, skills, performance and progression.
2. Observations which indicate signs of behaviour suggesting higher learning potential or underachievement.
3. Information from the student personally, parents, peers, educators and others who are familiar with the child.[8]

In such areas as development of language and motor skills, and an early start on reading, it is particularly important to involve parents in the identification process. Furthermore, dialogue with the student and information from co-students, educators and others who are familiar with the child are useful for obtaining knowledge about the student's potential.[9]

Input the Committee has received shows that many teachers find it difficult to know which students have higher learning potential. They need tools which can help them identify the students, and knowledge about what these students need when it comes to follow-up and teaching measures. Teachers need mapping and guidance material for identification, in addition to didactic techniques in the subjects they teach. Guidebooks prepared as resources for teachers must be practical and function as specific work tools. They must also be connected to activities that support learning. Teachers also need a repertoire of teaching strategies when identifying the potential of the children they are teaching.[10]

Education Scotland has developed resources which help schools and teachers adapt instruction to the personal abilities and aptitudes of the students in the work with differentiated instruction. The authorities have not implemented any special measures for students with higher learning potential, but have rather opted for personalised learning for *all* students. The purpose of the guidance material is that familiarity with the students through dialogue and mapping of progression and development should permeate planning of teaching, assessment methods and learning activities, see Figure 5.3. This does not mean that many different teaching schemes need to be prepared, but that the teaching must consider each student's potential. The individual learning of each student impacts how schools work with all these items. Education Scotland highlights some key processes that may strengthen the ability of teachers to adapt the instruction of the students so they perceive the learning in school as personal and relevant:

- Dialogue
- Subject curricula planning
- Learning activities
- Assessment
- Tracking and monitoring progression and adjusting the teaching

All these processes must be integrated and considered together in a culture where there are high expectations for all students. The students' learning must dominate school's work with the issues above and provide the basis for more flexible work with differentiated instruction which considers the individual differences of the students.[11] Students with exceptional learning potential have special needs for a differentiated instruction that provides personalised learning.[12]

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7 Blåsmo, T (11/06 2016): *Vil satse på evnerike elever [Will focus on gifted pupils]*. Budstikka [a local newspaper near Oslo]

8 Freeman 1998, Idsøe 2014a, SNAP 2007

9 Freeman 1998, Idsøe 2014a, SNAP 2007

10 Idsøe 2014a

11 Education Scotland 2015a

12 Gross 2004

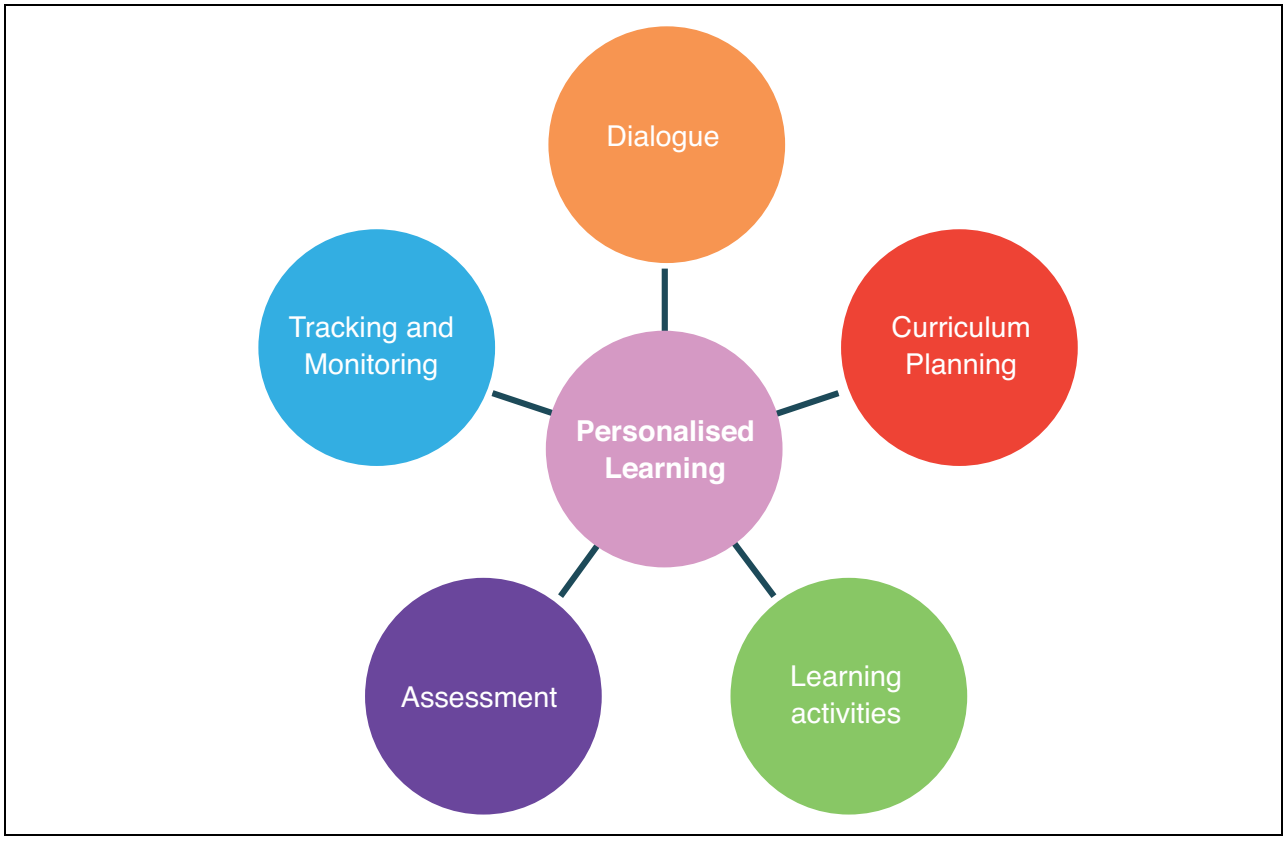


Figure 5.3 Personalised learning

Source: Education Scotland 2015 a

### 5.1.1 Early identification

The report to the Storing on lifelong learning establishes that the education system should step in as early as possible to help, stimulate, guide and motivate each child to do his or her utmost to realise his/her learning potential. Moreover, early identification and then early differentiation of the instruction may ensure a more stable social environment over time in the classroom.[13]

Early identification is decisive for developing the potential inherent in the child. If this is not uncovered, the child is at risk of not being seen and then being under-stimulated. For some children, school may be a disappointment because they may already be able to read.[14] Children do not start school with a clean slate, and it requires good communication between day care and school to give the children the best possible start in school where their needs and abilities are addressed. Early identification and early differentiation of the instruction may ensure a more stable social environment over time.[15] This requires knowledge about the children's experiences, current positions and abilities, already from day-care age, and this will not be available without good dialogue across the institutions.[16] Making good systems for the transition from one institution to the next are important for all students, and particularly for students with higher learning potential. In this context, relationships play an important role. Students with higher learning potential who are not given the differentiated instruction they need, may end up dropping out of school.[17] A research summary on non-completion, carried out by the Knowledge Centre for Education, shows that measures to strengthen relations may be of great importance for preventing non-completion. It may be difficult to establish good and trusting relations when the problems have become too large. Therefore, educational institutions must work continuously on building relations throughout the entire school system, from day care to

[13] Report to the Storting no. 16 (2006–2007)
[14] Skogen and Smedsrud 2016
[15] Børte et al. 2016
[16] Lillejord et al. 2015, Report to the Storting 19 (2015–2016)
[17] Børte et al. 2016

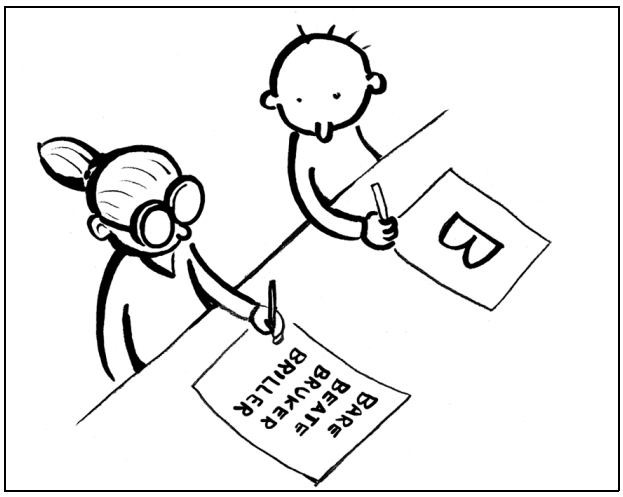


Figure 5.4

upper secondary education.[18] The Committee draws attention to the fact that day care does not come under the mandate for the report, but we still find it important to point out that it is important that children with higher learning potential can interact with adults in day care who can create an acknowledging and stimulating environment.

## 5.2 Differentiation

> Teachers must never make us standout or give us too much attention, neither positive nor negative. Teachers must talk about having different skill levels in the class as something normal and natural. They should not present it as if some are smarter and some are dumber, they should rather speak about how we learn in different ways and at different speeds.
>
> Input from *SkoleProffene*

Leading and differentiating learning activities means facilitating for mastering by all the students, including those with higher learning potential. This requires that teachers have knowledge about learning and use different teaching strategies in their work with the students. Differentiation is a feature of a teaching practice where the subject curricula, teaching methods, learning activities and student work are adapted by the teacher to satisfy the needs of the students.[19] Many students with higher learning potential are not included in groups receiving differentiated instruction, often because the teachers are more concerned with those who are struggling with the subjects.[20] The research summary concludes that the best strategy for students with higher learning potential is probably differentiation, but that the differentiation practices of the teachers is insufficient.[21] National evaluations of the Knowledge Promotion curriculum suggest that it is challenging to provide differentiated teaching for all (the social dimension), while also strengthening each student's learning outcome (the academic dimension).[22]

Educational and organisational differentiation are important educational measures for students with higher learning potential. *Educational differentiation* refers to differentiating the instruction to satisfy the learning needs and abilities of the students. This may for example be accomplished by means of enrichment of the subject curricula and use of ICT as an educational tool. *Organisational differentiation* takes the school's structural conditions as its point of departure and includes scheduling of teaching hours, grouping of students, social interaction and the use of teacher resources.[23]

### 5.2.1 Educational differentiation

Educational differentiation means that the teacher adapts the content, work process or product to the potential, motivation and knowledge level of the students and to their different ways of learning.[24] Such adaptation shall contribute to supporting the students' motivation and development in the subjects. For students with higher learning potential this is particularly important as they often need more complex and challenging tasks and activities than many of their peer age group.[25] By giving the students special tasks, such as oral presentations or independent work with tasks in their areas of interest, the students will have better opportunities to develop their self-regulating abilities, which in turn may be important in preventing underachievement.[26] Independent work still requires guidance and support from the teacher.

Examples of differentiation may be:

– *Content* (determine the student's development level, compress the subject matter, adjust the

[18] Lillejord et al. 2015
[19] Tomlinson 1999
[20] Børte et al. 2016
[21] Børte et al. 2016
[22] Hodgson et al. 2012
[23] Bailey et al. 2008, Børte et al. 2016
[24] Tomlinson 1999
[25] Idsøe 2014b
[26] Bailey et al. 2012

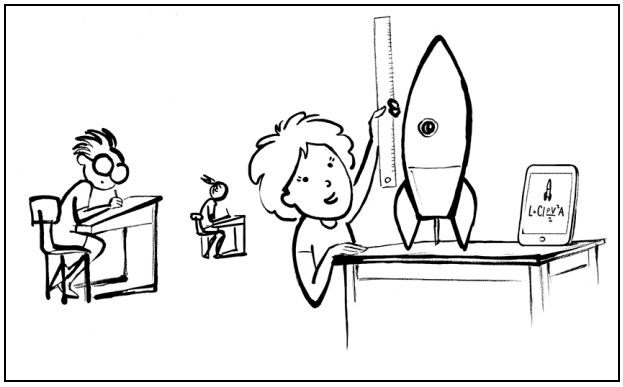

Figure 5.5

complexity, and allow time to reflect and construe meaning)
- *Process* (formative assessment, guidance, learning strategies, different methods of providing information, open tasks to encourage problem-solving methods, flexibility in organising groups and complexity of tasks, self-regulated learning, co-participation)
- *Product* (use different media and methods for presenting products, show complex and deep mastery of a topic, self-assessment of effort as part of a metacognitive process)
- *Learning environment* (create a safe, risk-free learning environment, dialogue and discussion between students, balance the dialogue between teacher and student, listen with respect, remain open to new ideas and teaching aids, model acceptance of each student's unique and different abilities and aptitudes)[27]

### *Enrichment of subject curricula*

Enriching subject curricula is one way of working with educational differentiation which focuses on elaborating and broadening the subject matter. Opportunities for elaborating and broadening the subject matter in some or many subjects will benefit students with higher learning potential.[28] By enriching the subject curricula the teacher will take on a role which will help the students to acquire competence in learning and independently acquire new knowledge, rather than through traditional teaching where the teacher transfers knowledge to the students.[29] Enrichment may be accomplished in several ways. Some practical general recommendations for teachers who teach students with higher learning potential are mentioned in the textbooks.[30] These refer to subject matter and competence objectives which must be more abstract, complex, varied and organised according to concepts. Furthermore, the use of problem-solving strategies is recommended, as well as using open tasks and the application of metacognition (which stimulates higher cognitive processes). Using technology for educational purposes and giving students options and variation between individual learning and cooper-

**Box 5.1 Example of enrichment activities**

The research summary refers to a review of studies of enrichment activities in the *Schoolwide Enrichment Model*, developed by Renzulli. These studies highlight two different activities (type 2 and type 3) that deal with the development of investigative skills. The purpose of type 2 activities is to promote skills such as thinking, research, communication and method competence, while type 3 activities focus more on individual student activity and the investigative role. Here it is expected that the student shall think, feel and act as professionally as possible.

*The most important findings from the studies are:*

- Students participating in type 2 activities had a higher probability of initiating investigative projects
- Students who were allowed to work with elements from both type 2 and type 3 activities produced more complete products with higher quality
- Students who participated in type 3 activities showed positive development of personal skills and in deciding career and education choices

In the development of investigative skills, a high level of independence is required, while cooperation is necessary for producing products of high quality.

Source: Børte et al. 2016

[27] Idsøe 2014a
[28] Børte et al. 2016, Idsøe 2014a, Skogen and Smedsrud 2016
[29] Renzulli 2005
[30] Tomlinson 1999, Winnebrenner 2003

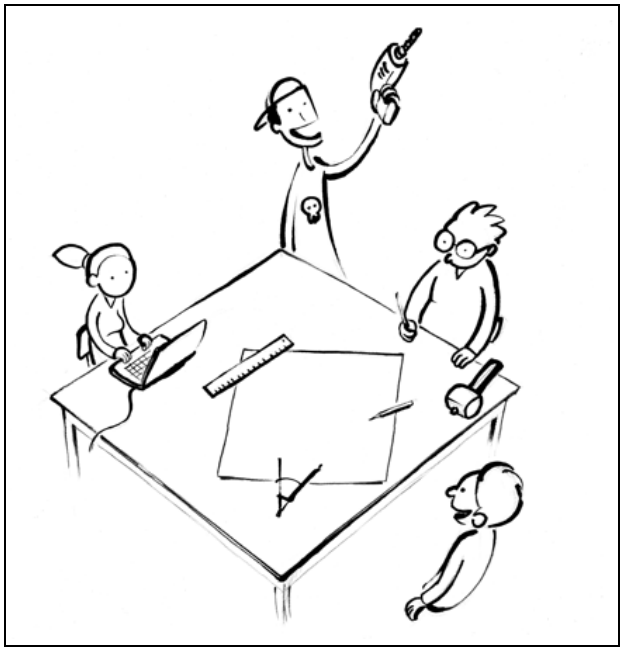

Figure 5.6

ative learning are also suggested as important steps.[31]

In recent years, the FIVIS study has shown results which may indicate that schools find it challenging to work with the subject curricula in their entirety with respect to an in-depth and broad approach. Teachers are struggling to set up learning objectives that are approachable and that give direction to the weekly and monthly learning activities of the students. There are also examples showing the learning may become fragmented when the learning objectives are broken down into learning goals that are detached from the subject's big picture. The FIVIS study, for example, shows that schools which work well instantiating the goals as part of assessment for learning also have good subject competence and work well with the subject curricula. This indicates that there is a need to increase the understanding of the connections between the subject-curricula objectives, local curriculum activities, ways of working in the subject, feedback to students and assessment in the subject. The need to work with in-depth learning in school is confirmed in the final report from the SMUL project.[32] This project refers to the lack of depth in the verbal interaction in the classroom and the importance of exploration and support for the students' understanding of the subject matter. This may apply to work with relatively simple tasks connected to identifying or producing and then registering units such as words, concepts and factual knowledge. It was especially in the first years of primary school that importance was attached to relatively simple reproduction of knowledge elements.[33]

### *Use of ICT as an educational tool*

One way of working with differentiation is to use ICT in the instruction. According to the TPACK model (technological, pedagogical and content knowledge), the pedagogical use of ICT may be understood as the teacher's composite competence in three knowledge areas: subject and content, pedagogy and technology, see D in Figure 5.7.[34] Using ICT as a pedagogical tool means that digital tools may support the teaching, contribute to better learning for the students and become a natural part of the instruction. This means that only possessing or using one of the knowledge areas – subject, pedagogy or technology – will not contribute to better learning for the students.

Technology alone cannot improve the day-to-day work in school for teachers and students, but with correct use it may have a positive impact on student motivation and learning. Schools that have introduced technology in their learning processes see that more students with different abilities retain their motivation for learning, and that the students can learn at their own pace.[35]

The ARK & APP 2016 survey shows that teaching a plenum session with the whole class consumes around half of a teaching session.[36] The teacher's monologue when teaching the full class may have a very demotivating effect on students whose knowledge may at times surpass that of the teacher. For all students, but particularly for those with higher learning potential, this may become dull when there is little stimulation. The use of digital teaching material is increasing in Norway, and most teachers in year 9 in lower secondary school and year 1 in upper secondary school (Norwegian abbreviation Vg1) use digital teaching resources in the subjects of natural science, Norwegian and social science.[37] This may allow students with

31 Børte et al. 2016, Tomlinson 1999, Winnebrenner 2003

32 SMUL is the Norwegian acronym for "Connection between teaching and learning, ways of working, development of skills and learning in Norwegian, natural science and social science"

33 Hodgson et al. 2012

34 Mishra and Koehler 2006

35 Mishra and Koehler 2006

36 Gilje et al. 2016

37 Report to the Storting 28 (2015–2016)

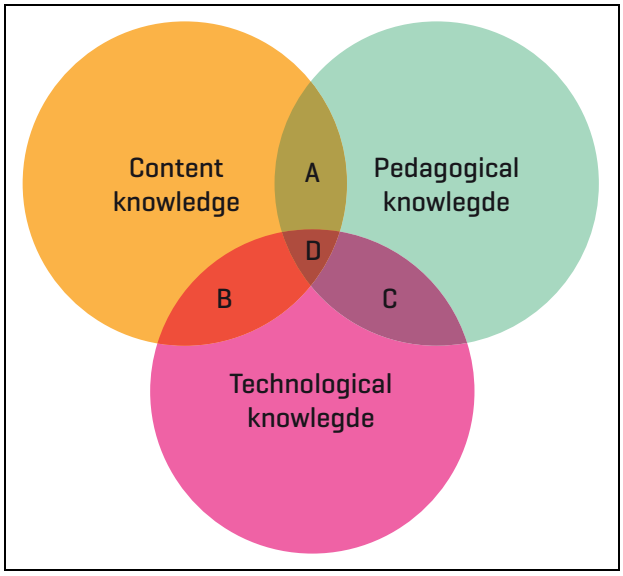


Figure 5.7 TPACK (Technological, pedagogical and content knowledge)

Source: Mishra and Koehler 2006

higher learning potential to work more interdisciplinary and in-depth at their own tempo.

ICILS 2013 shows that there is a strong call for competence-raising of teachers, and that measures to raise teachers' profession digital competence in subjects have not been properly systematised in the Norwegian school. Norway still has some way to go to be able to differentiate the instruction and facilitate for use of ICT as an education tool. A country it is interesting to compare Norway to in this context is Denmark. Danish students achieve on a par with the Norwegian students in the study, and Denmark has the same circumstances in terms of resources and attitudes. But the Danish school has integrated ICT in the teaching much more than Norway. The main reason for this is probably the central focus on developing good digital teaching aids.[38]

The use of ICT as an educational tool, for example by "flip teaching", or reversing the traditional classroom teaching[39], or a virtual school, requires a paradigm shift on the part of students and teachers. It also requires the availability of dedicated teachers who can provide good instruction in online learning because it is the selection of web pedagogical techniques and how the teacher uses digital tools in the teaching that impact the learning outcome of the students.[40]

An example of the use of ICT as an education tool is DVM [the Virtual Mathematics School]. DVM provides in-depth learning and studying in upper secondary school level mathematics for students in lower secondary school, see Chapter 6 about skipping years. This is a free web-based supplement to the regular instruction in lower secondary school to give the students motivating and improved differentiated instruction. When the Committee visited schools, geographic discrimination, access to contact with an upper secondary school and large variation in the follow-up the students receive from their own lower secondary school were frequently raised topics. This is due to the varying extent to which schools have understood the implementation of DVM, and not least to the rules for skipping years.[41] The Committee also finds themes and tasks which involve mathematical creativity to be important, and students with higher learning potential appreciate them.

Organisations, school owners, school leaders, teachers and students have provided the Committee with input that states that it must be possible to move ahead (skip years, subjects) and study in-depth in the same way in other subjects than just mathematics. DVM shows how a school that is making use of ICT as an education tool influences the students' learning outcome and sense of mastering in a positive way.

### 5.2.2 Organisational differentiation

> We are all different, and there is no one solution that suits everyone. Some want to be taken out of the class to work with challenges on their own, in groups or with older students, while others want to stay in the classroom with their co-students and rather be given challenges there.
>
> Input from *SkoleProffene*

Organisational differentiation refers to how the students are grouped so that their subject needs and levels can be addressed properly. Students may be divided into different classes or groups based on their interest in a subject or subjects, or what they have aptitudes for (subject dif-

[38] Hatlevik and Throndsen 2015, Ottestad et al. 2014

[39] Often called "flipped classroom": pupils watch a video lecture or presentation on the web (most often at home) and spend their time in school solving tasks and doing group work

[40] Børte et al. 2016

[41] *Ministry of Education and Research* 2016a

**Box 5.2 Section 8-2 first paragraph of the Norwegian Education Act. On organisation of students**

The students may be divided into groups as necessary. The groups must not be larger than is justifiable in relation to pedagogy and security. The organisation shall safeguard the students' need for social belonging. Students shall not normally be organised according to their level of ability, gender or ethnic affiliation.

ferentiation).[42] Moving ahead or skipping a year is also a form of organisational differentiation.

The social interaction and the social composition of students in a group is the decisive factor for students with higher learning potential to perform well. This may be more important than composing groups according to the level.[43] The research summary therefore points out the importance of group differentiation as a measure supporting learning. Social interaction may influence how the students work best, and it is important to consider the students' need for cooperation, both with like-minded students and others. It is of great importance how school leaders and teachers group students. The teacher must be familiar with characteristics of the group of students and have an understanding of group processes and group dynamics if the chosen groupings are to strengthen the students' motivation for learning. The teacher must also know the needs of each student. What constitutes good cooperative relationships in the class or school keeps changing, and must therefore be an important element of teachers' professional knowledge.[44]

Section 8-2 first paragraph of the Norwegian Education Act describes the provisions for organising students in classes or base groups.

The basic point of this provision is that the instruction must be inclusive. *Veiledningen om organisering av elevene. Opplæringsloven § 8-2 m.m [Guide to organising students. Section 8-2 of the Education Act etc.] from the Ministry of Education and Research, refers to how school must actively consider the different abilities and needs of all students when organising content and teaching.*

The school's learning environment depends on the social interaction between the students, and in a good learning environment the students contribute and support each other's work and learning. Contributing to all students achieving their learning potential and providing good differentiated instruction in a diverse group of students may be challenging work.[45]

When it comes to the term *normally* in the wording of the Act, this is the legal point of departure and the general rule: students shall be in classes or base groups for so much of the time in school that their need for social belonging and stability is satisfied. This may be deviated from in specific cases when there is sufficient reason in the best interests of the student, and when the school has a clear and well-considered relation to how the instruction is organised.[46] If the students are to be organised according to their level in subjects, the assessment of this need must be made on a regular basis so that the organisation will be as flexible and limited in time as possible. The term *normally then opens for organisational differentiation for periods of time if this is appropriate for the students' needs and learning outcome.*

While working on the report the Committee has experienced that there are different interpretations as to how this provision should be practised. This is consistent with findings from a national review in 2009, where the issue was whether the local authorities and private schools had an acceptable system for ensuring that the organisation of students in groups is in accordance with the Education Act and the Act relating to Private Schools. The actual organisation of students in groups was not examined. The results showed deviations of 67 per cent for the local authorities and 29 per cent for the private schools. The Norwegian Directorate for Education and Training in this connection pointed to the need to assess the rules.[47]

Social relations are highlighted as particularly important for students with higher learning potential. They need their teachers to accept and understand them. There are also indications in research that they learn best in groups. However, current research cannot give a clear answer as to what the optimal group composition should be. A knowledge overview[48] concludes that there is support for differentiated instruction for students

42 Report to the Storting 20 (2012–2013)
43 Børte et al. 2016
44 Børte et al. 2016
45 *Ministry of Education and Research* 2013
46 *Ministry of Education and Research* 2013
47 Norwegian Directorate for Education and Training 2009
48 Bailey et al. 2012

**Box 5.3 Gaupen primary school in Ringsaker municipality**

Figure 5.8

Gaupen school has more than 100 students and has worked across years and subjects for more than ten years.

The school has an action plan for "Children with higher learning potential and gifted children" which was prepared in the spring of 2014. It is revised regularly and its purpose is to help and support teachers in how to work with the students, parents and external cooperation partners.

The action plan consists of an action log with measures and distribution of responsibilities, dialogue forms with characteristics, teacher and parent forms for each subject and the student's self-reporting form.

The action plan aims to ensure that the students who are performing better than expected in a subject are given additional challenges. These students may be those who have a great talent in a subject, students with higher learning potential and skills above the competence objectives for the school year in question or are gifted children. Differentiated instruction requires flexibility in how the instruction is adapted to each student, and the didactic programme will necessarily have different outcomes.

What is required so that we will manage this is that the school has good attitudes to the principle of differentiated instruction and can satisfy the students on their personal subject level. The teacher must be solution-oriented and seek cooperation with colleagues to find the best solutions for the student. As a school, we cooperate closely with parents and the student on his or her development and improvement potential. To determine whether the goals and work tasks the student is given provide challenges and mastering, we have dialogues with the student where the aim is the students' co-participation in their own development.

The staff at Gaupen school cooperate on an on-going basis for the students by giving each individual good and challenging instruction. The goal is differentiated instruction for all. The students who have particularly high abilities also need good differentiated instruction, says Gerd Elin Borgen, Gaupen's head of school.

A common measure in the school for these students is to let them attend classes in another year than where they ordinarily belong, if this gives the best adaptation for the subject in question.

The competence and observations of the teachers and mapping test results are the basis for the assessment of the students and consequently the subject differentiation. The head of school and the teachers discuss the needs of individual students on an on-going basis. In the annual year-review dialogue with the head of school, they discuss which students need special instruction, Gerd Elin states. In the dialogue meeting, the leader and the teacher discuss how the teacher can work with students on both ends of the scale. There we discuss which students this might concern, and which challenges can be given to the students. We also have a dialogue on how the teacher can focus on measures for the whole group together, and how this can be carried out in practice. We ask ourselves about how we can work so that what we initiate will benefit all the students.

To create the flexibility needed for differentiated instruction, the school has introduced two elements: digital and personal learning plans for all students and a relative homogeneous subject teaching structure.

When all the students have their own digital subject curriculum, it is easy to adapt it in a way so that the students do not stand out, so the feeling they may have of being different is not reinforced. Then the subject teacher, and not necessarily the class teacher, is responsible for filling in the subject curriculum for the student in question.

Box 5.3 (continue)

The structure for the differentiated instruction means that all the teachers in the school endeavour to schedule their subjects in parallel time slots for all the years, if possible.

These organisational measures make it possible for a student to leave his or her classroom to take the subject in another year, without risking missing anything else. When this is not feasible, agreements are made with the parents about the teaching hours the student loses in his or her regular year, and then we draw up a plan for how we think the student should work with this, Gerd Elin tells us.

Source: Johansson 2016, input from Gaupen school

with higher learning potential, and that grouping according to levels in both heterogeneous and homogeneous groups is preferred.[49] Finnish research recommends that the students should be given teaching individually or in groups with other high achieving students. The group may be homogeneous or heterogeneous, but the instruction should preferably take place in different learning situations involving students socially in the full class.[50]

A research summary[51] on students with exceptional learning potential[52] shows that part-time efforts may have a noticeable positive effect on students' academic self-perception, motivation and emotional development. This may include separate teaching with other students with higher learning potential some hours each day or one day a week. The study finds that students are challenged and strengthened in their subjects and experience more well-being in school. Parents of students with higher learning potential find that their children pay more attention and are less hyper-active. This requires that schools are confident in their didactic choices, and that they manoeuvre through the legal rules in a well-defined way.[53] The Committee believes that the social interaction in a group is important for the students to perform well, but the social interaction does not necessarily have to be with their peer age group or in the school they attend. The Committee believes that group activities and opportunities to work with *both* like-minded and other students is important. There is a need to clarify the options schools have with examples of good practice and updated guidance material.

Boks 5.3 shows how a primary school is working with differentiation across years and subjects.

The Committee has visited several schools that are planning the instruction and work with differentiated instruction based on the needs and abilities of the students. This is accomplished by scheduling teaching in one or more subjects in parallel time slots, so that teachers and students can move freely across rooms and topics in accordance with the teachers' competence and the needs of the students in the subjects.

Several schools have suggested to the Committee that the guidebook on organising students should contain concrete examples showing how this provision can be practised. The challenge for the schools is that the County Governors interpret the provision differently and their conclusions, advice and remarks are based on different interpretations.

The Committee believes that organisational differentiation does not violate the intentions of the Education Act with respect to social belonging or inclusion, as long as the teachers adapt the differentiation in accordance with the students' learning needs. For some periods of time some students might need such differentiation, either based on learning outcome or social needs. This professional assessment must always bear in mind what is in the best interests of the students in the short and long run, and the Committee believes that any level differentiation which is too broad and too static may have negative academic and social consequences on the societal and individual levels.[54]

[49] Børte et al. 2016
[50] Børte et al. 2016
[51] Mehlbye et al. 2015
[52] In this research summary, the group of pupils is limited to 1-2 per cent of the population
[53] Mehlbye et al. 2015
[54] Boaler et al. 2000

## 5.3 Summary and assessment

If students with higher learning potential are to be given differentiated instruction that will motivate their learning and give them challenges in the subjects, it is important to identify their needs and abilities. This requires research-based knowledge on the needs the students have and what characterises their challenges and strengths. The students must be acknowledged but at the same time should not be made to look different. Knowledge is needed on how to identify the students identified in a beneficial way, and guidance material is needed to show how this can be accomplished in practice. The Committee finds that schools need support for this work and recommends that knowledge-based mapping tests and guidance material should be developed for identification purposes and to serve as the foundation for giving didactic advice with respect to the subjects in question, for the schools, the local authorities and the PPS. The Committee also recommends that the school owners should assume responsibility for ensuring that schools and the PPS have competence in and resources for identifying students with higher learning potential and for providing differentiated instruction for them. The Committee recommends that the national authorities should be responsible for the development and use of an e-learning module for schools and the PPS and for raising competence relating to students with higher learning potential.

The research summary points out some educational measures that are especially focused on differentiated instruction for students with higher learning potential. Examples include the provision of challenging tasks on high levels, metacognition and self-regulation skills. The Committee would also like to suggest enrichment and pedagogic use of ICT as examples of *educational differentiation which aims to provide students with higher learning potential with improved differentiated instruction*. The Committee recommends that teachers use research-based knowledge and vary their teaching methods through such approaches as in-depth learning and enrichment. For students with a higher learning potential, it is particularly

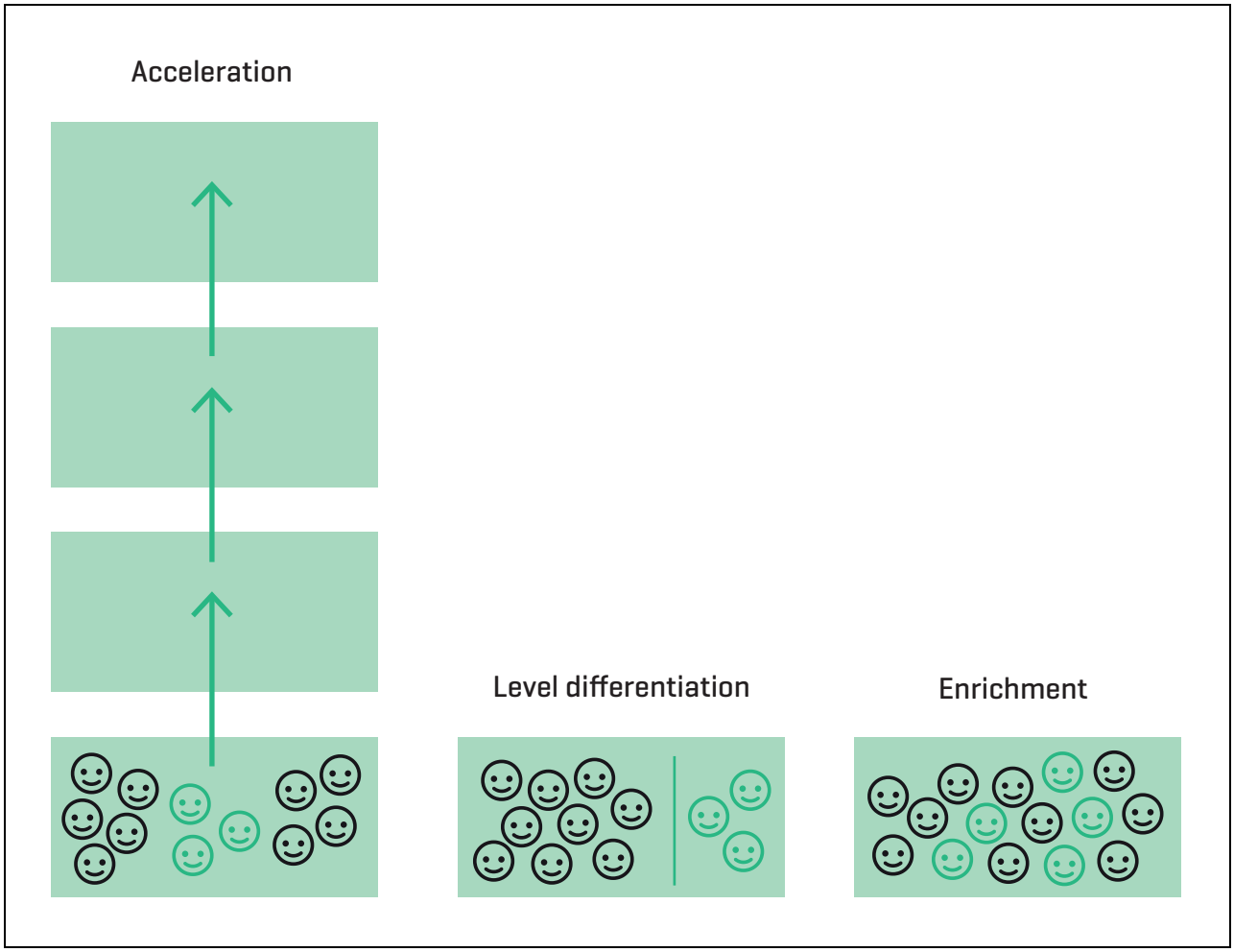


Figure 5.9 Examples of educational and organisational differentiation

important that work with the competence objectives allows them to go deeper into the material and find challenges suitable for their level and abilities. For some students, various forms of acceleration or progression in individual subjects or topics may be important for their learning and development. If the students are to be given individual guidance and gain insight into their own learning processes, teachers and school leaders need systems to track their progress. The Committee therefore recommends that the national authorities should take steps to ensure that the progression descriptors in the guidelines for the subjects will provide examples of competence on high and advanced levels, and will support the teachers' work in differentiating their instruction for students with higher learning potential. These descriptors must be developed parallel to the renewal of the subject curricula in the Knowledge Promotion curriculum. The Committee recommends that the national authorities should ensure that digital learning resources are developed for students which will feature in-depth learning in all subjects.

The Committee does not recommend a permanent division of students, for example into level-determined groups, as students with higher learning potential will develop at different speeds and have different strengths and challenges. Flexibility is needed in the work with differentiation, whether in the educational or organisational areas. As a point of departure, the Committee believes that the needs of the student in a subject will be the most important factor when grouping students, but grouping should not be static as the level in subjects is dynamic, ever changing and varying according to topic, subject and theme. This means that the subject level may not necessarily determine the grouping, but rather what the students at any time need to work on. A professional assessment is needed, where the one constant is what is best for the students in the long or short run. The Committee believes that a division into levels that is too extensive and static may have negative consequences for the subjects and for social aspects on the societal and individual levels. The Committee emphasises that the social interaction in a group is particularly important if students with higher learning potential are to perform well. Organising students according to social interactions may function as a measure to support learning. Participation in different social contexts based on academic needs and achievement levels means giving students the opportunity to aspire for something on the academic level. It is important to point out that social interaction does not necessarily take place with peer age students or the school the student in question is attending. The Committee therefore believes that group activities and the opportunity to work with *both* like-minded and other students are important. The Committee therefore recommends that the school leaders use existing research and facilitate for a flexible organisation of students with higher learning potential.

Chapter 6

# Special measures and options

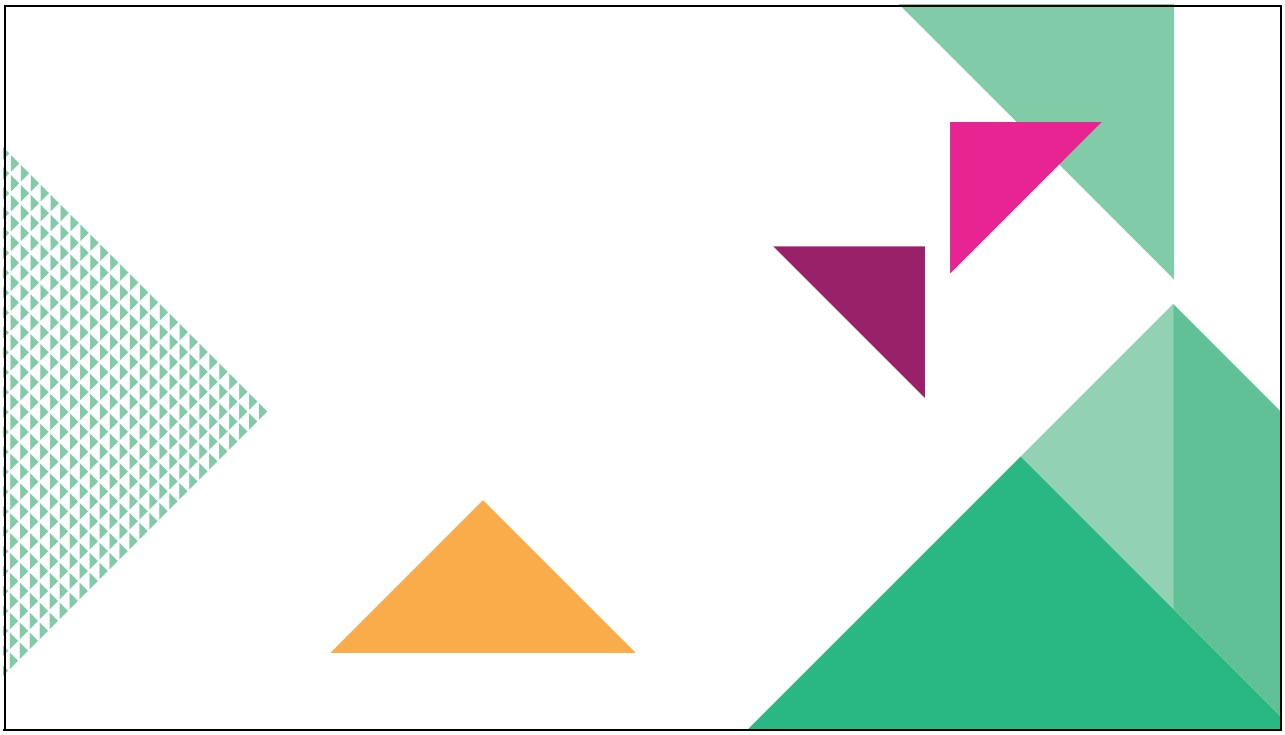

Figure 6.1

In this chapter we will look more closely into special measures within and outside the regular instruction. We present the options that are available within the rules in force, and on-going measures for raising competence relating to the rules and regulations. The chapter describes the Committee's assessment of various ways of moving ahead: skipping years, or accelerating the instruction, separate schools for students with higher learning potential and extracurricular programmes.

## 6.1 Options for taking action within the rules in force

Organisational choices and the rules and regulations determine the framework for how schools may implement measures for students with higher learning potential.[1] Table 6.1 shows the schemes and possibilities available in Norway within the current rules relating to: early school start and progressing at a quicker pace by skipping years, taking subjects on higher levels and redistributing up to 25 per cent of teaching hours in a subject.[2]

### 6.1.1 Starting school early and skipping years

Statistics are not available on the national level to show us how many students have started school a year early or who have skipped a year. The possibility of starting school early and skipping a year may challenge the structure and organisation of the educational pathway. The research summary indicates that the school leaders are divided in

1 Børte et al. 2016

2 It is also possible to use period-intense instruction for whole classes in subjects with locally administered examinations in upper secondary education so that the subjects are finished after one term rather than after the full year of education

Table 6.1 The rules in force in Norway

| Rules and circulars | Content | Description |
|---|---|---|
| Section 2-1 third paragraph of the Education Act | Starting school one year early | The student must be five years old before 1 April. An expert assessment constitutes the basis for such a decision. |
| Section 2-1 fourth paragraph of the Education Act | Moving one or more classes ahead | The student may be exempted from the obligation to attend classes. An expert assessment constitutes the basis for such a decision. |
| Section 1-15 of the Regulations relating to the Education Act | Moving ahead in a subject | Students in lower secondary school may take subjects in upper secondary school. |
| Circular Udir-1-2016 Distribution of subjects and tuition periods, and the structure of the Knowledge Promotion curriculum | Re-distributing up to 25 per cent | For individual students, the school owner may redistribute up to 25 per cent of the tuition periods stipulated for each subject. |

Source: Norwegian Directorate for Education and Training 2016c

their view of starting school early or moving ahead a year and whether this may have negative consequences for the children's social development. This is consistent with input the Committee has received from school owners, school leaders and teachers. Students who have skipped a year have been successful in their schoolwork and are satisfied with their choice.[3] There are many concerns about negative consequences of such measures, for example that it may lead to gaps in knowledge, and that it will not benefit social development, but so far there is no research supporting such concerns.[4] For the individual student who needs to start school early or move ahead a year it is important that this opportunity exists their learning potential can be developed and exploited. Input to the Committee from the PPS indicates that there is a wish to be able to follow up these students in cooperation with the schools. The PPS wants to compile facts relating to the number of students this involves on an annual basis, and how these students do. The service also wants access to research that can inform them whether the students are satisfied with the choice and whether they are able to develop their learning potential.

### 6.1.2 Moving ahead in individual subjects

This is a form of accelerated schooling, and means that students follow the curriculum for a subject from one or more years above the year they are attending.[5] An example is when students follow the teaching in a subject in upper secondary school while still in lower secondary school. Section 1-15 of the Regulations relating to the Education Act applies to students who have satisfied the competence objective in the subjects in lower secondary school, and who have sufficient competence in the subject to be able to follow the teaching on the upper secondary school level. In the 2015–16 school year, 1600 students in lower secondary school took subjects in upper secondary education, 600 more than in 2011–12. Of these students, 86 per cent were attending the tenth (last) year in lower secondary school. More than 100 municipalities had students in lower secondary school who took subjects in upper secondary education. Among the largest municipalities, Drammen and Oslo had the highest participation in percentage. Here, respectively 10 and 5 per cent of students in year 10 took subjects in upper secondary education.[6]

The provision for moving ahead does not include students in the primary school years, but such students may be exempted from the obligation to take instruction in a subject[7] which enables them to sit for the final examinations in lower secondary school. Moving ahead is not regulated in

3 Børte et al. 2016
4 Børte et al. 2016
5 Norwegian Directorate for Education and Training 2013a
6 *Ministry of Education and Research* 2016d
7 Cf. section 2-1 of the Education Act

**Box 6.1 Section 1–15 first paragraph of the Regulations relating to the Education Act**

*The possibility of taking subjects in upper secondary education for students in lower secondary school*

The students in primary and secondary education and training must follow the education in all subjects as stipulated in the curriculum, cf. section 1-1. However, this does not apply in full to students in lower secondary school who have sufficient competence in that level of school subjects to follow the education in one or more subjects in upper secondary education in accordance with the curriculum. In upper secondary education, students from lower secondary school may take general studies subjects and programme subjects which build on the subjects in lower secondary school. The local authority makes an individual decision that the student in lower secondary school may take one or more subjects in upper secondary education. Before the local authority makes the individual decision, consent must be obtained from the student or the student's parents.

the Regulations for students in upper secondary education and training, but the circular Udir-4-2013 refers to a letter from the *Ministry of Education and Research*[8] *stating that upper secondary schools and institutions for higher education may cooperate on making it possible for students in upper secondary school to follow teaching and sit for examinations in selected subjects in higher education*. This means that students may acquire subjects that may at a later stage be incorporated in a degree in higher education. The Committee is now aware that upper secondary schools in Bergen, Oslo and Trondheim have entered into this type of agreement and are cooperating with universities and university colleges.

As moving ahead basically has not been regulated in upper secondary education, this means, for example, that pursuant to the current rules in force it is not possible to be a student both in mathematics 1T (mathematics theory) and mathematics R1 (mathematics for natural science) simultaneously in the first year of upper secondary school (Vg1). If students wish to take both these subjects in Vg1, they must take R1 as an external candidate as both subjects have centrally given examinations. If these examinations are set on the same day, 1T has precedence, as this is the examination on the lowest level. The students must then take the R1 examination as an external candidate at a later point in time. The input to the Committee from students, teachers and school leaders shows that this restriction impedes the opportunities students have, and this also has financial consequences for the students with the need to move ahead in subjects.

School leaders and teachers are aware to different degrees of the opportunities for moving ahead in subjects, and input to the Committee shows that schools would like to raise their competence relating to the practice of the rules. How school owners and schools deal with the rules and use the options available to them has consequences for the follow-up and differentiation for the students who move ahead.

The provision allowing students to move ahead in subjects is an offer schools may choose to give, and this means that nobody has the right to take subjects from upper secondary education while they are students in primary and secondary education and training. This makes it too random when it comes to who is given a chance to move ahead in a subject, and this could lead to geographical discrimination of students in cases where the distance is long between the lower secondary school and an upper secondary school. Budget concerns, geography and organisation of teaching schedules appear to be common grounds for not offering students this opportunity.

Input from students shows that the programmes for moving ahead are not well planned and several find that this process becomes more of a self-study pathway than a planned function in school. The Committee finds that it must be assessed on an on-going basis whether moving ahead is the correct choice for the individual student, and in cases where the teaching is educationally and organisationally planned, the person who is responsible for this at the school must ensure that the students do not risk the disadvantage of ending up with a knowledge gap between the different school levels. Moving ahead and ensuring good quality requires regular follow-up by the teachers, and planned and systematic cooperation between the schools. It demands a holistic view of the students' educational pathway, where

[8] Information given in Circular Udir-4-2013

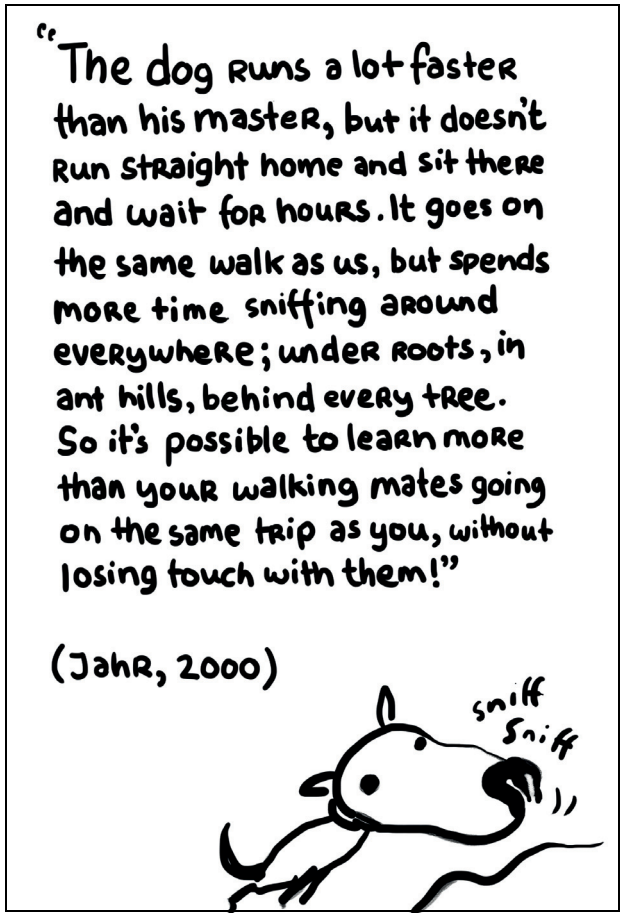


Figure 6.2

planned and targeted schemes help to determine when the student should start moving ahead and which students should move ahead. It is important that funding and geography do not put a stop to moving ahead for students who live in more remote areas. The stakeholders on several levels have strong wishes that virtual schools are developed to offer in-depth studies in more subjects than just mathematics.[9] Virtual schools may help reduce the geographical discrimination of students.

Input to the Committee shows that opinions are divided on the concept of moving ahead in Norway. On the one hand, it is recommended as a completely necessary and good measure for students with higher learning potential, but it is only suitable for a limited number of students (estimated at one to two per cent of the student population). If they are allowed to move ahead, the students are motivated by the opportunity and inspired by the greater challenges in the subject. Students the Committee has been in contact with have stated that moving ahead by taking university studies, for example, has positively impacted their work in school. The research summary refers to studies where students state that they are positive to moving ahead and that they experienced mastering at the university. Several students stated that the opportunity to move ahead was what motivated and helped them through school, and what also stopped them from dropping out of school.[10]

Some school leaders offering input to the Committee believe that moving ahead means that students will hurry through a subject to achieve quick progression without quite understanding that progression could rather mean in-depth studies in a subject. The students might have unexpected problems in higher education because they are not accustomed to exploring and the trial and error method. There is also the risk of treating the subjects as one-dimensional units without any relevance to other subjects where progression is prioritised over enrichment and interdisciplinary understanding. The Committee is of the opinion that students should not hurry through things, but rather learn to explore and dig in-depth. This cannot be dons as self-study, but must be supervised through guidance and support from teachers.

The Committee supports the use of the moving ahead measure to satisfy the needs of students who have good learning outcome from doing this. But is it worrisome if schools and teachers use this measure as a "quick fix", pushing the students forward on the education pathway without offering them differentiated instruction where they are. Educational and organisational considerations must be made to enable a proper approach to moving ahead in a learning environment with a culture for differentiated instruction, and the Committee believes this may be relevant for one to two per cent of the student population. Moving ahead must not become a quick-fix solution in cases where the school does not find other alternatives for the student.

### 6.1.3 Re-distribution of up to 25 per cent of the tuition periods in subjects

All the subjects in the main curriculum have a binding distribution of the tuition periods laid down in the national legislation, more precisely in section 1-1 (primary and lower secondary school)

[9] Input from input-meetings, meetings with the organisations, school visits and written input

[10] Børte et al. 2016

**Box 6.2 Circular Udir-1 – 2016**

*Distribution of subjects and tuition periods and structure of programmes for the Knowledge Promotion curriculum*

School owners may re-distribute up to 25 per cent of the tuition periods stipulated for each subject for individual students. The re-distribution should lead to better goal satisfaction in the subjects in total for the student.

The re-distribution is not a right, but requires an administrative decision, and the school owner enters into a written agreement about re-distribution with the student or parents.

Source: Norwegian Directorate for Education and Training 2016c

and section 1-3 (upper secondary education) of the regulations relating to the Education Act. School owners may re-distribute up to 25 per cent of the tuition periods that have been set in each subject for individual students in the entire primary and secondary education period. If tuition periods are re-distributed for a student using the 25 per cent rule, the requirement relating to the set number tuition periods in the subject or subjects in question lapses. This scheme may be used by students with low or high school performance. This re-distribution is not laid down in the Act or regulations, but information on this is given in the annual circular from the Norwegian Directorate for Education and Training.

School leaders the Committee has been in contact with state that they are uncertain about the application of this rule, and that there is doubt about what it implies and how it should be used. They also state that the 25 per cent rule is not used much, and that examples should be provided to model good practices of this provision.

The Committee supports the idea that schools should have the option to act in the student's best interests, but the understanding of legal status, knowledge about the circular and how to practice the 25 per cent rule should be critically reviewed. On a general basis, the Committee finds that the school's options should be expressed through comprehensible legal rules.

## 6.2 On-going measures to clarify the options available

A common feature in most of the input to the Committee, and from the school visits and meetings the Committee has had with relevant expert environments, is the hope that the report will contribute to

- initiating processes that can clarify the rules
- assisting in creating a common and consistent approach
- raising the competence teachers have with respect to students with higher learning potential

On the national level the Committee is aware of three current measures launched precisely to help school to comply with the rules and stimulate a more coordinated and consistent application of the rules by the county governors.

- *Felles nasjonalt tilsyn* [Joint national review] for the years 2014–2017.[11] This examines the school's work with students' learning outcome and administrative competence.
- *RefLex.*[12] Web-based tools aimed at assisting public schools and school owners in assessing whether their practices are in accordance with the Education Act and relevant regulations.
- The project *Regelverk i praksis [Rules and regulations in practice] 2014–2016.*[13] This project aims to increase compliance with the rules in the best interests of Norwegian schools. It must be easier to comply with and understand the rules and regulations and make discretionary decisions in the everyday affairs of school. The point of departure for the project is that there is poor correspondence between what is the desired learning quality and the practice in Norwegian schools. The main challenge is that parts of the sector do not understand, or to varying extents do not feel obliged to comply with the rules they are supposed to administer, so the rules are not implemented in accordance with the intentions and objectives behind them.

According to the report *Tilsyn med veiledning skaper endring*[14] [Supervision with guidance creates change], the guidance activities connected to the joint national review have especially changed attitudes relating to supervision in general, rectified deviations quicker and

[11] Norwegian Directorate for Education and Training 2013c
[12] Norwegian Directorate for Education and Training 2015a
[13] Norwegian Directorate for Education and Training 2015c
[14] Norwegian Directorate for Education and Training 2016e


Figure 6.3 Example from Rogaland. On its website, Rogaland county authority shows how the schools may use the option to redistribute tuition periods for students with higher learning potential (Here the term "gifted students" is used, in Norwegian).

Source: www.fylkesmannen.no/Rogaland

changed practice. But there are many schools that do not have an established procedure for assessing whether the students have satisfactory learning outcomes from the instruction.

When it comes to *Regelverk i praksis [Rules in practice]*, sub-project 2 examines roles and responsibilities.[15] The Committee believes this project and its recommendations should be continued, as it deals with differentiated instruction, early intervention and grouping of students. The following is highlighted in the sub-project:

- There is a strong political focus on differentiated instruction and early intervention, and differentiated instruction is a key political measure and a pervasive theme in the rules and regulations. This area impacts student learning outcomes, and may lead to enhanced skills and a reduction in non-completion rates.
- The amendment to section 5-4 (2014) of the Education Act contributes to forcing schools to work more with differentiated instruction and early intervention. The amendment also has consequences for the PPS, which must work in a more systematic way.
- The process of discretionary assessment in connection with section 8-2 in the Education Act, relating to the organisation of students into groups, requires fundamental understanding and experience with discretionary and justifiable assessment in cases involving exemptions from the main rule. This is important for inclusion, integration and equal treatment of students.
- The understanding of the concepts varies, and schools are uncertain as to what is adequate when it comes to satisfying the requirements in the rules and regulations. The main stakeholders in this regulatory area are teachers, school leaders and school owners. Furthermore, special-needs teachers and PPS staff are also important stakeholders, particularly in relation to competence and organisation development, cf. section 5-6.
- The teacher with specific responsibility for the practical, administrative and social- educational tasks relating to the student, including contact with the home (the contact teacher) is particularly important for differentiated instruction and early intervention, pursuant to section 1-3 of the Education Act.[16]

[15] Norwegian Directorate for Education and Training 2013b

## 6.3 Assessment of special extracurricular measures

When assessing special measures for students with higher learning potential the Committee has considered special schools and extracurricular programmes. Today Norway has no separate schools especially focused on students with higher learning potential, but the Act relating to Private Schools opens for establishing profile schools. These are schools that want to have a particular focus on one subject or course, schools that want to build on another educational philosophy than public schools or schools approved on other legal grounds in the Act. When it comes to extracurricular programmes, they may be quite necessary and decisive measures to prevent non-completion.[17]

### 6.3.1 Separate schools for students with higher learning potential

> What we need is not special schools, but to get special people into school who can motivate the children. Children need teachers who have visions, and who treat them with respect.
>
> May-Britt Moser[18]

In Norway and other European countries noticeable attention was not given to students with higher learning potential until the end of the 1990s. A consistent belief has been that measures should be implemented within the framework of the regular school. Special schools for students with higher learning potential could undermine the idea of the Norwegian comprehensive school, where the fundamental value is that the students learn to socialise with and accept all children – this principle includes the understanding that students have different learning abilities. Some countries have special schools for students with higher learning potential, for example Denmark, Austria and the USA. In Germany, Austria and Switzerland there are different types of special schools and classes which may have more compressed subject curricula with quicker progression or in-depth studies in subjects.[19]

Results from research on separate schools or classes in Europe and the USA show that students who learn more rapidly have a positive attitude to school, and describe schools as stimulating both socially and academically. But these measures may also have a negative effect on academic self-perception and have an impact on motivation.[20]

There are a number of examples of media reports in recent years that make a point of the fact that some students in Norway with higher learning potential have moved to Denmark to attend schools for this student group. One example is a mother who is quoted by *Aftenposten* [a major Norwegian daily] as saying that her daughter aged nine was not given the same challenges in Norwegian primary and secondary school that she could get in Denmark in a private school.[21] Some of the common features of the families that have chosen to move is that they experience that the school did not listen to them. They find that the school, the PPS and the BUP (psychiatric service for children and young people) lack the competence to understand the student's situation and to differentiate for the student's learning needs. Parents have told the Committee that it is a taboo topic to raise the idea or even mention that a child can learn more quickly than other children, and some have been accused of believing that their child is more valuable than the other children. They despair, saying "It's not about value or being elitist, it's simply about how all children should experience well-being and thrive."[22] The parents point out that it is not about highlighting one group as more important than any others, but that all groups should experience well-being and the opportunity to develop in school, including students with higher learning potential.

The Committee's meeting with parents, students and schools shows that the social aspect of learning, and whether the students are given differentiated instruction, plays a large role in deciding whether they develop and are capable of exploiting their potential, or whether they stagnate, stop working at school, become ill or drop out. This applies to all students. According to the research summary, research findings on special schools for students with higher learning potential do not provide any clear proof that special schools are the best solution for the students. While some studies have shown social benefits

16 Norwegian Directorate for Education and Training 2013b
17 Input from pupils, parent and teachers
18 Midling 2014
19 Børte et al. 2016
20 Børte et al. 2016
21 Bordvik, M. (07.08.13). *Flytter familien til Danmark fordi datteren får for lite utfordring i norsk skole [Moving the family to Denmark because the daughter does not get adequate challenges in Norwegian school]*. Aftenposten
22 Input from parents

from specialised schools, others conclude that students who attend schools adapted to their level in subjects may feel socially stigmatised due to the absence of social support systems. The problem of students with higher learning potential dropping out of school may be linked to the lack of deep relationships. Particularly important are the students' relationships to teachers, which greatly impact work in school subjects and social development. The negative aspects mentioned often relate precisely to social circumstances, and these are particularly connected to problems that arise when the social surroundings are changed when switching schools. However, it is difficult to ascertain whether the social drawbacks derive from the transition to specialised schools, or whether they can be related to switching schools in a more general perspective. The studies of selected schools referred to by the research summary appear to focus much more on student well-being and less on their actual performance. These studies therefore do not provide sufficient grounds for concluding for or against the use of selected schools. A good social environment appears to be very important – regardless the type of school.[23] We do not have research that clearly shows that separate schools are the best solution for the students, but it is still important to look to at what other countries with special schools for students with higher learning potential have found. This applies to teaching strategies, learning methods and flexible solutions which may improve the public school in its work with differentiated instruction. The experiences, plans and educational approaches of these schools may provide useful inspiration and knowledge to the Norwegian school.

The Committee does not recommend separate classes or schools for students with higher learning potential. The requirements for good education for students with higher learning potential refer to acknowledging their abilities, maintaining their interest in school subjects and exploiting their large potential for learning. It appears that what is important is both to maintain interest in the subjects and create a good social environment for a group of students who feel marginalised.[24]

### 6.3.2 Extra-curricular programmes

Norway has less experience with differentiated instruction for students with higher learning potential compared to other countries in Europe. When it comes to extracurricular measures, a pilot project has been launched in Norway with talent centres in natural science subjects to give high achieving students better instruction.[25] The aim is to give the students the opportunity to study in-depth and give them more demanding challenges in the subjects in question. Other extracurricular programmes include the Abel Competition, UngeAbel [Young Abel], Kengurukonkurransen [the kangaroo competition] and vocational competitions,[26] which can serve as arenas where students with higher learning potential can meet like-minded peers and work on different challenges.

Input the Committee has received shows that several students have had genuine benefits from extracurricular programmes. Students who have taken part in *Forskerfabrikken* [the Researcher Factory], Nordic talent competition and Energy Camp, state that many times this was their salvation, something that kept them going and gave inspiration to work in the regular school situation the rest of the year. The students experienced something that was quite different, but they also wanted to go further, and when they came home they would ask themselves: "OK then, and what now? A whole year until the next time?"[27] In addition to talent centres and competitions, summer school, afternoon school, job/study placement and various mentor schemes may be implemented to satisfy the needs of the students.

In some countries, extracurricular programmes are found to be an important measure for students with higher learning potential because it is felt that school alone cannot produce an optimal environment or academic stimulation for these students. Museums, libraries, laboratories and other institutions are involved in educating the students. Mentor programmes that bring students with higher learning potential and specialists together to expand resources for the students may also be included in the extracurricular programmes.[28]

Extracurricular courses and summer school for students with higher learning potential are not widely used in Norway compared to other countries in Europe.[29] International experience of offering students courses in their spare time, and

[23] Børte et al. 2016
[24] Børte et al. 2016
[25] Follow-up of the natural science strategy *Tett på realfag [Close on natural science subjects]*
[26] Worldskills, Vocational WC / EC / NM
[27] Input from pupils
[28] UNESCO 1984
[29] Germany, Switzerland and Austria

**Box 6.3 Odense, Denmark**

The local authority has established special teaching for students from year 2 to year 6 two hours a week after school hours at the local school. Starting in year 7, the students are offered special teaching in a lower secondary school. The aim of the teaching is primarily to bring the children together with like-minded peers to increase their well-being. The reason is that many of these children feel socially isolated on an everyday basis, thus having lower self-efficacy. What is special about the teaching is that the children determine the content, it is project-oriented and based on the children's interests. Moreover, the school has helped the parents form networks to exchange experiences of being parents of a child with higher learning potential.

This activity had to be dropped after the implementation of the Public School Act because the students ended their school day too late in the afternoon. The local authority is now considering other initiatives, including a summer camp, where the young people will work with a specific product, and where different workshop activities will be arranged for them. The local authority believes that there is a need for a special programme for these children who often have some social challenges in relation to other students, are often interested in other things than their peers, and easily land in conflicts with them.

During the last two school years (2014/15 and 2015/16) four entrepreneurship schools have arranged camps for students with higher learning potential. These camps aim to give the children good experiences, where working together, collaborative work and success are primary goals. These children and their everyday challenges shall also be put in focus.

Odense local authority finds that there is approximately one student in each class who may be characterised as highly gifted. To assesses a child's gifts, the local authority does not use an intelligence test, rather the approach that is applied involves observation and dialogues with the child and parents.

In cooperation with "ScienceTalenter" at the Mærsk Mc-Kinney Møller Videncenter [Knowledge Centre] in Sorø, the local authority is involved with the project "ScienceTalent Genius", which will run for three years starting in August 2014. The goal of the project is to academically and socially challenge selected highly gifted children in years 6 and 7. The children will participate in three camps annually for three years, where they will spend time with other children from Odense and Vejle at the Mærsk Mc-Kinney Møller Videncenter in Sorø. Currently 25 students from various public schools in Odense are participating.

The project is evaluated as a research project.

Input from Odense local authority, Denmark

school during holidays indicates that the students gain positive long-term effects, boosting self-confidence, and improving personal development, independence and social competence.[30] They have the opportunity to study in-depth, learn something new and spend time with others with higher learning potential. Summer schools have a positive effect on students who underachieve[31] and may influence the general and emotional self-perception of students positively.[32]

The Committee has received input from two cities in Denmark, Gentofte and Odense, which have several programmes for students with higher learning potential. The example from Odense is described in Box 6.3.

In England and Wales good results have been attained by arranging clubs in schools which focus on the students' interests (for example chess) in addition to clubs that give the opportunity to study topic areas or study subjects in-depth. Examples of such club activities are building bridges, learning about astronomy or joining a writing workshop. Some schools also have connections with experts in such areas as history or geology. Examples like this are also found in Norway where schools and after-school programmes offer courses and activities based on the interests of students.

30 Børte et al. 2016
31 Mehlbye 2015
32 Mehlbye 2015

The Committee finds that extracurricular measures may be necessary for students with higher learning potential. It is not within the mandate of the Committee to propose concrete measures outside the school system, but the Committee points out that such programmes may be very important for students' motivation, learning and well-being – thus also directly impacting the school situation for the students.

## 6.4 Summary and assessment

We do not have sufficient research to draw clear conclusions about the consequences of skipping a year and moving one year ahead, but we find nothing to indicate that this has negative social or emotional consequences.[33] Norwegian school leaders and teachers are concerned that the students will have gaps in their knowledge or less interest in school, but we cannot find that this is supported by research.[34] The PPS has expressed the wish to obtain an overview of and research on students starting school one year early in Norway so the service can improve the guidance they give to children and parents about this choice.

The Committee finds that competence in understanding the rules and regulations relating to skipping years should be raised to clarify the legal provisions and the options available to school owners and school leaders. The Committee recommends that the national authorities should clarify what options school leaders, school owners and the county governors have in the current rules and regulations, for example by using national competence development measures such as *Regelverk i Praksis* [Rules in practice] and RefLex. Even if measures have been initiated to clarify the available legal options, there is a need to ensure that school owners, school leaders and the county governors are acting in a consistent and coordinated manner. Table 6.1 shows the options available to schools in creating measures for the students, but the Committee finds that these provisions are not being used in the students' best interests.

When it comes to the opportunity for school owners to redistribute 25 per cent of the tuition periods for individual students, the Committee believes that the guidelines and information material relating to this should be reviewed to ascertain more closely how the possible options can be communicated and exploited in a better way.

It is important to make it possible for students to skip a year and move ahead when this type of measure will benefit them, and this must be independent of geography and budgets. We believe that it is important to provide good and continuous learning pathways for these students, but that this group of students should not amount to more than one to two percent of the student population. The main aim must be that the regular instruction is good enough to satisfy the needs of the highest possible number of students, where skipping years and moving ahead is not found to be necessary for academic stimulation. The Committee recommends that the national authorities assess measures to ensure that the school owners cooperate and assume responsibility for programmes that will make it possible for the students in question to skip years/move ahead.

Research from special schools for students with higher learning potential does not supply clear answers as to what is in the best interests of the students. On the other hand, researchers and schools agree that a good social environment is extremely important. This may refer both to nurturing the academic interests and creating a good social environment. The Committee does not recommend separate schools for students with higher learning potential.

When it comes to extracurricular programmes, these may nurture the interests of the students and raise topics not covered in the regular education, or give opportunities for in-depth studies of various topics from school. The experience[35] of Norwegian students shows that these programmes may offer more challenging and inspiring learning situations than they encounter in school, and that they provide opportunities to meet other like-minded peers.

[33] Børte et al. 2016

[34] Børte et al. 2016

[35] Input from students

Chapter 7

# Excellent learning environment through professional cooperation

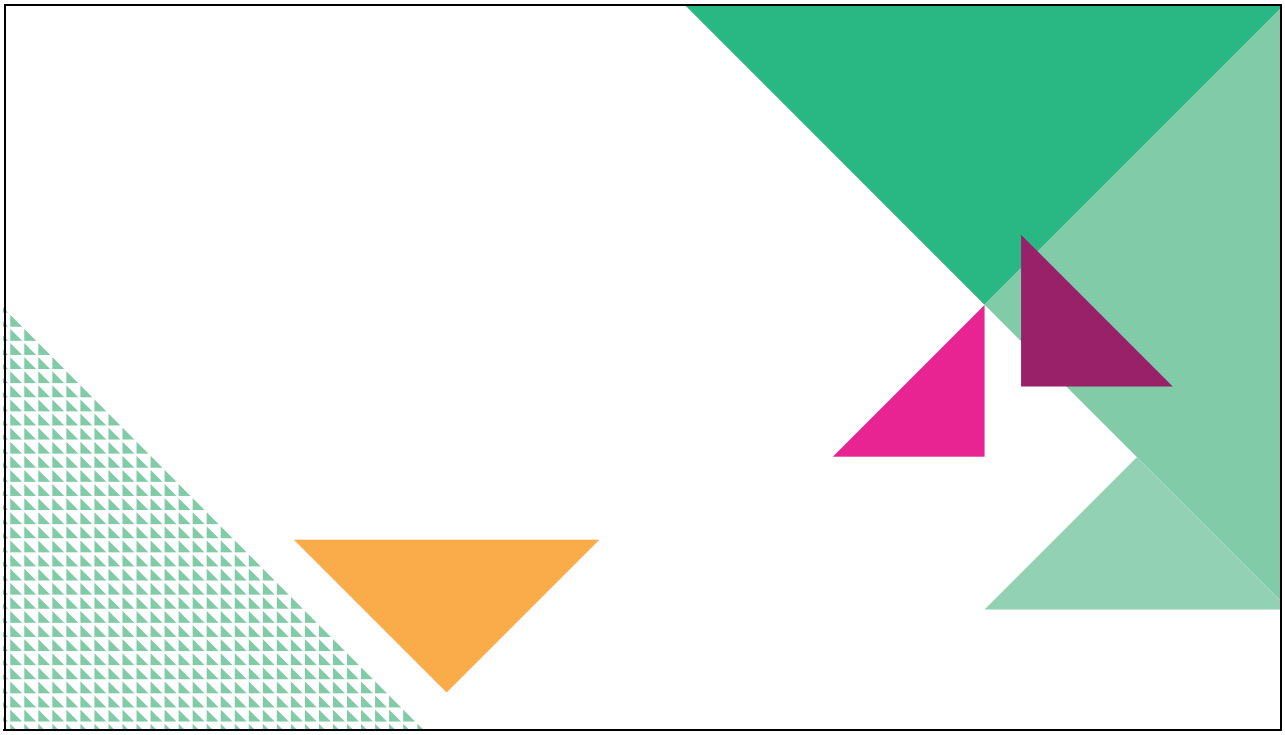

Figure 7.1

> The very basis for establishing good differentiated instruction lies, in my opinion, in the learning culture that exists in the school at any point in time. It is the basic perceptions about who we are as professionals, and the human and academic engagement we show in the encounter with the students that determine the quality of the work we do. What is our main focus every day we come to work? In our school, I find that the main focus is that the job must be done and it must be done in a professional manner. This is the mental focus that directs the daily energy on to solving the challenges we are facing in a constructive way.
>
> Input from a head of school

The Committee points out that the professional cooperation between the teachers in a school is extremely important for creating a learning culture and ensuring good quality of differentiated instruction for students with higher learning potential. The teachers' professional assessment of the progression of the students must be the point of departure for the differentiated instruction in the subjects. The head of school and the teachers must discuss and assess the needs of individual students on an on-going basis and must differentiate the instruction in accordance with this. The quality of the cooperation and how this is embedded in the school's holistic work on collective professional development will determine whether the cooperation improves the students' learning.

An excellent learning environment refers to more than what the teacher does in the classroom. The work on learning through professional cooperation must be systematised, where the aim is to achieve high quality and good learning outcome. Cooperation and reflection must be goal-focused and must therefore be reflected in the

quality descriptors that serve as guidelines for the national authorities, school owners, school leaders and teachers.

The key aspects of quality development are problem identification, analysis of current status and problem solving. Many schools lack the competence to work in this way. Often teachers do not have the necessary competence to differentiate instruction even though they expected to do this. This refers for example to the teachers' subject competence and pedagogical content knowledge. Teachers the Committee has been in contact with state that they also lack resources, training and support from their superiors – both the school leaders and school owners. Both have an important responsibility for supporting the educational activities. According to the OECD report *Innovative Learning Environments*[1], students' learning must be at the centre of all the work carried out in a school. All planning and all work must scaffold and support students' learning. The report refers to several examples from a number of countries where teachers and school leaders are focused on the students' learning rather than the teaching strategies of the teachers because the instruction must be adjusted as the students learn and develop.

Germany, Poland, the USA and Singapore have general teachers as Norway does, but additionally train mathematics teachers to act as specialists in the primary school years. These subject specialists serve as important support for colleagues and assist in the differentiation of the instruction in the school.[2] The Committee finds it important that the school has sufficient competence in all the subjects, which is a requirement for being able to differentiate the instruction for students with higher learning potential.

In all questions relating to differentiated instruction, the school's overall competence and the teachers' professional discretionary assessment determine the quality of the instruction the students receive.[3] The Committee finds that it is the teacher's encounter with the students on a day-to-day basis, the teacher's relationship to the students and the teacher's professional assessments of students' needs that are decisive for the student's learning environment. The teaching profession has a great responsibility to ensure quality in the instruction for all students.

Teachers may see the attention given to students with higher learning potential as a major challenge, and call for more dedicated competence and support from their own colleagues, the school owners and the national education authorities. Many teachers do not work in teams, and they lack support from colleagues.[4] Research findings also agree that students with higher learning potential need broad variation in the teaching activities if they are to be motivated by the instruction. The most effective methods for keeping them focused are to differentiate the instruction through systematic and lasting work (with measures being applied on a regular basis), to have broad variation in activities, to document the work through a structured process and evaluate this work with the aim of making improvements. Such practice must also be implemented with support from leaders on all levels.[5]

## 7.1 Responsibilities, tasks and expectations on all levels

A fundamental requirement for raising the quality of the school programmes for students with higher learning potential is that all the levels in the education sector fulfil their responsibilities and carry out the accompanying tasks and duties, see Figure 7.2.

The Committee finds the need for national formulation and communication of clear expectations to all stakeholders – the national authorities, school owners, school leaders, the PPS, teachers and teacher-training institutions. The committee believes this will clarify responsibilities and roles, and also be a useful point of departure for necessary dialogues between the various stakeholders. Below we will highlight some ideas and aspects we think should be included in the description of expectations.

### 7.1.1 The role and responsibilities of the national authorities

Realising quality in school is the responsibility of the school owners, and through clear governance[6] and targeted support the national authorities[7] shall ensure that the school owners base

1 OECD 2013a
2 Grønmo and Onstad 2012
3 Børte et al. 2016
4 Børte et al. 2016
5 Børte et al. 2016
6 Rules, supervision and grant schemes
7 *Ministry of Education and Research*, Norwegian Directorate for Education and Training and County Governors

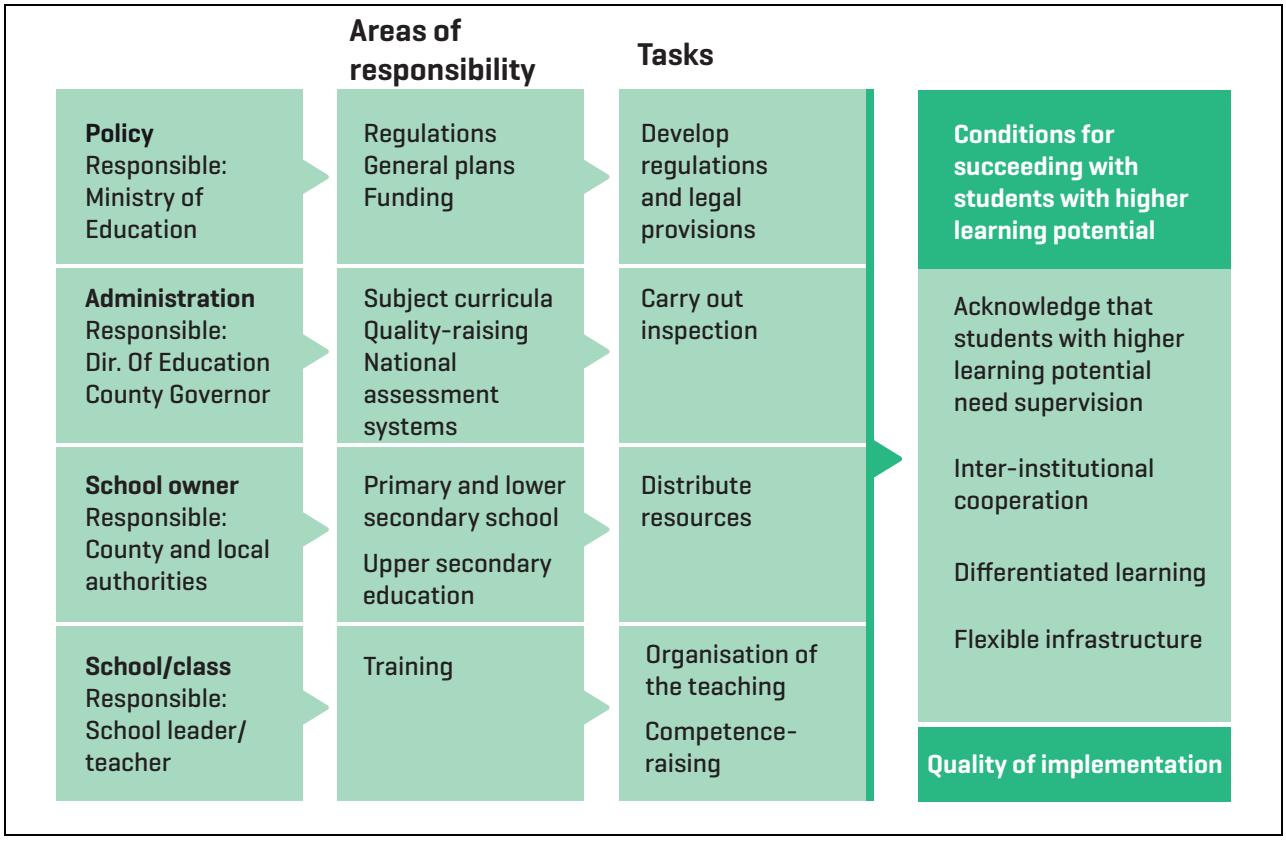


Figure 7.2 Responsibility and tasks on all levels to succeed with measures for students with higher learning potential

Source: Børte et al. 2016 p. 24

their work on what research has found to enhance student learning. Furthermore, the national education authorities must ensure that the school policy is formed and realised in such a manner that it increasingly supports the opportunities of individual students to learn and develop. Knowledge about what promotes learning, what ensures collective school development and how effective school leadership gives results has been well documented and is readily available. What must be done to ensure that the school's practice is based on what research shows gives good effect is unclear. The Committee sees that the constellation of stakeholders is complex, and it takes time to change and achieve visible results. Not least, the national vision of goals is unclear and generally dominated by descriptions of *activities*, and much less dominated by descriptions of the *results one wants to achieve*.

The national authorities have the overriding responsibility for education and have an important role as the implementing body of the adopted reforms for the Norwegian school sector. The Committee addresses most of its recommendations to the national authorities to ensure better differentiated instruction for students with higher learning potential across Norway. The efforts to increase knowledge and improve practice must be coordinated nationally to ensure that this issue receives the proper amount of attention and resources and that results are attained – in other words, a common platform for creating change.

On assignment from the Swedish Government[8], the Swedish *Skolverket* [national school administration] has prepared a resource site[9] for heads of school and teachers, special-needs teachers and health staff working with children on how to work with students with higher learning potential, see Figure 7.3. The resource site with articles, research, a toolbox for teachers and various resources was up and running as of May 2015. This is a good example of how the national authorities can contribute to improving knowledge about this group of students, as we recommend in Table 1.1 in Chapter 1.

8 Skolverket 2015b
9 Skolverket 2015a


Figure 7.3 Example of resource site from Sweden

Source: www.skolverket.se

### 7.1.2 The role and responsibilities of teacher training institutions

Teachers gain their basic competence through their education, and both the basic training and further education and continuing professional development (CPD) shall be knowledge-based and practice-oriented. Moreover, the teacher training must promote cooperation and collective professional development so that new knowledge is continuously transformed and integrated in the teachers' culture, their competences and their professional judgement. Teacher training is thus an important part of the work to ensure quality in the instruction for all students – including students with higher learning potential. The Committee endorses the goal and provision of on-going processes for an attractive high-quality teacher training as formulated in *Lærerløftet [Raising teacher competence]*.[10] Input received by the Committee shows that little attention is paid to students with higher learning potential in today's teacher training.

Teacher training should also provide more autonomy for teachers in the practice of differentiated instruction because student teachers find this very difficult to carry out in practice – regardless of whether this is for low or high achieving students.[11]

The findings in a recent study[12] show that student teachers need more training in designing and carrying out differentiated instruction for students with higher learning potential. The researchers conclude that the student teachers should not only be given lectures about this, but that they also need guided training on campus before entering practice and reflecting on their practice afterwards. Teacher educators should also differentiate their own teaching and inform the student teachers how they go about doing this.[13]

The Committee understands that all teacher educators need more knowledge about this group of students, particularly about how differentiation and the student's needs can be addressed in practice. The Committee finds it important to highlight the following expectations for the teacher training- institutions to achieve better education for students with higher learning potential:

10 *Ministry of Education and Research* 2014

11 Tomlinson 1999

12 Brevik and Gunnulfsen 2016

13 Brevik and Gunnulfsen 2016

- Knowledge about and explanation of what characterises students with higher learning potential
- Knowledge about and explanation of what characterises differentiated instruction for *all* students
- Knowledge about and presentation of:
  - Principles of learning
  - Identification and acknowledgement
  - Organisational differentiation
  - Educational differentiation
- Promotion of practice-based research and presentation of research findings
- Cooperation and partnership agreements with the practice field, for example in connection with the schools' development activities and the training of student teachers
- Internal cooperation and participation in networks with other institutions to share knowledge about students with higher learning potential

Research on students with higher learning potential must be connected to teacher training. The research must originate in the school's practice, and the teacher training must contribute in a strong way to the training of new teachers and to the professional development in the schools. The Committee finds that the idea of having university schools, where excellent research is the point of departure for the development of student teachers and the pedagogical content knowledge of the teachers, may be a good way of strengthening teacher competence and differentiation. This may be particularly beneficial for students with higher learning potential.

### 7.1.3 The role and responsibilities of the school owner

Through input and dialogues with practitioners the Committee has observed that currently it is too random as to whether school owners, the PPS, school leaders and teachers have knowledge about students with higher learning potential and the competence to differentiate the instruction. Much depends on how committed to this issue the teachers and school leaders are. Some school owners have developed a plan for better differentiation for students with higher learning potential, but they are too few in number.[14] The Committee finds that such a plan in itself does not result in better differentiated instruction for this group of students – strictly speaking, it should not be necessary to have a separate plan for such students – rather implementation of the requirements for an excellent learning environment for all students should be the goal.

Compared to other countries, Norway has few students who achieve on a high and advanced level in international studies, see Chapter 3. The role of the school owner as the official body responsible for quality in the instruction is decisive for changing the situation we have today. The Committee points out that it is through active school ownership, clear assignment of responsibilities, clear definition of roles and good professional environments in the schools that the students will be given high-quality instruction throughout their entire learning pathway – regardless of where they live or come from. As the official body responsible for quality instruction, the school owners must ensure that the teachers have the proper competence. The Committee finds that assessments must be made as to whether the responsibility of the school owner should be clarified through the development of national quality descriptors. If such descriptors are to function as clear premise setters from the national authorities to the sector, they must represent an agreed upon uniform approach that will have significance for practice and the interaction between the local and national levels.

Norway has many small school owners, the tasks are complex, and many need support. Such support may be given in the form of guidebooks and school development tools found on udir.no. In a questionnaire[15] sent to schools and school owners, the alternatives *reflection tools for use by school colleagues and guidebooks received good feedback as useful support in the responses from the local and county authorities*. Education Scotland has developed resources for schools in the resource leaflet *How Good is Your School?*[16] Here national quality descriptors have been formulated to help Scottish schools to develop school quality.

Based on input the Committee has received during its work on the report, we see there is a need to clarify what is expected of the school owners to increase the quality of the instruction. The principles of learning, cf. Figure 4.4, should be the point of departure for the school owner's work on systematising its efforts to realise a learning environment of excellent quality. The Committee wishes to recommend the following points as

[14] Gjerustad and Waagene 2015

[15] Gjerustad and Waagene 2015

[16] Education Scotland 2015b

**Box 7.1 Examples of quality descriptions**

The framework consists of a set of 15 quality descriptors made to help teachers and school leaders answer three questions connected to work, learning and development in their school. The quality descriptors are divided into three categories:

1. *Leadership and administration:* How good is our leadership and our approach to improvement?
2. *Instruction:* How good is the quality of the care and instruction that we provide?
3. *Success and achievement:* How good are we at ensuring that all the students achieve the best possible results?

By combining the results of the quality descriptors in the three categories, the teachers and school leaders may find answers to the question: How good are we at implementing continuous improvement? Or put differently: How good can we become?

The model (Figure 7.4) illustrates the close connection between the three categories and the key question about the school's ability to improve. A selection of suitable results from each of the three categories is required to evaluate the school's overall quality. But it is still possible to apply only some of the quality descriptors, or only some of the themes from some of the quality descriptors to support school-based evaluation of specific aspects of school life and work.


Figure 7.4

Source: Education Scotland 2015b

important expectations relating to how school owners can provide better instruction for students with higher learning potential:

- Build capacity so that the schools have knowledge about what characterises students with higher learning potential
- Create a common understanding and common responsibility in school for differentiated instruction for *all* students
- Establish systems for tracking progress and development
- Facilitate cooperation and communication in and between schools (have a common approach to and understanding of learning)
- Competence-raising
- Close cooperation with the PPS
- Follow-up/supervision
- Support the schools' work to provide more differentiated instruction for students with higher learning potential

Measures to support the school owner:

- Clarify and specify who the stakeholders around the school owner are
- Mapping tools, guidance material and resources supporting the work with the items mentioned above

Much important work is being done on the county authority and local authority levels for students with higher learning potential, and here we present some examples. The Committee has seen how the school owners in Asker, Bærum, Oslo and Stavanger are focusing on competence-raising of teachers and school leaders. These local authorities have seen the need to coordinate ideas and experiences in the schools because they believe that students with higher learning potential are an overlooked group. The school owners have each in their own way initiated pioneer projects aimed at raising the knowledge level of teachers so they will see and satisfy the needs of the students.

Bærum local authority has involved students with higher learning potential in the development of measures for this student group. They have


Figure 7.5 Bærum local authority's website

Source: www.baerum.kommune.no

developed guidance material for the schools with the purpose of satisfying the vision of the Bærum schools that all students should have the absolute best academic and personal outcome of their schooling. The guidance material provides knowledge about student characteristics and shows examples of how the schools may identify the students.[17] Moreover, the local authority has initiated courses for teachers and involved students with higher learning potential in the development of a plan for this work.[18]

### 7.1.4 The role and responsibilities of the school leaders

Bearing in mind their approach to knowledge on and awareness of how students learn, the Committee finds it important that the school leaders and the school owners also give serious consideration to how teachers develop and change their practice in a professional culture. The school leader's ability to lead teachers' learning is a decisive dimension in providing quality teaching in each school.[19] The school leader must have insight into and the ability to realise open discussions about teaching practices and student results. A head of school who personally participates in such discussions, and who is familiar with the quality of the teaching, will have better opportunities to direct the development in the school.

One should not think that just any type of collective learning for teachers will result in improved student learning. There are many ways in which learning efforts could go wrong. When teachers congregate, they sometimes end up reinforcing each other's misconceptions about the challenges the students have, and spend too little time exploring their own practice.[20] Studies reviewed in the research summary also indicate that schools may be problem-oriented. One way of changing the focus from problem to possibility may be to speak about what the students need. For example, students with higher learning potential need to be seen and understood on their own premises, but they should not be "displayed" or be given unnecessary attention so that their co-students see them as different. Shifting attention from problems to needs represents a change in culture which requires initiatives from the school leaders, and which must be based on knowledge

17 Bærum local authority 2015
18 Input from Bærum local authority
19 Robinson 2014
20 Robinson 2014

from research and input from students and parents, in addition to sound professional discretionary assessment.[21] A well-functioning professional learning environment will bring greater diversity into analyses of one's own practice, thus enabling the environment to build capacity and together determine how the students learn in the best possible way.[22]

The Committee considers it very important that the school leaders call for the development of a common language to be used when analysing teaching quality, the learning environment and results.

The Committee finds that the following expectations for the school leader need to be clarified:

- Ensure that knowledge about the characteristics of students with higher learning potential is transformed into practice in the instruction
- Create a common understanding and a shared responsibility in the school for differentiated instruction for *all* students
- Knowledge about:
  - Principles of learning
  - Identification and acknowledgement
  - Organisational differentiation
  - Educational differentiation
- Establish systems for tracking progress and development
- Use available options, and give the students opportunities to progress and have in-depth studies
- Allocate time and plan for cooperation and communication at the school
- Work on local curricula on an on-going basis
- Have close cooperation with the PPS
- Ensure systematic cooperation between the school and the home for better learning conditions for the students

Measures to support the school leader:

- Clarify and specify who the stakeholders around the school leader are
- Provide mapping tools, guidance material and resources supporting the work with the abovementioned items
- Train heads of school and provide other training for school leaders

These expectations should also have consequences for the content of *Rektorutdanningen*[23] and other school leader training.

[21] Børte et al. 2016

[22] Fullan 2011

### 7.1.5 The role and responsibilities of the teachers

The strategy for competence-raising of teachers *Lærerløftet [Raising teachers]*[24] highlights the following aspects of a good teacher: "There are many characteristics of a good teacher and what is good teaching. Solid knowledge in the subjects is a requirement for succeeding as a teacher. The importance of subject knowledge for the students' learning outcome has been well documented in research. Teachers who are confident about their knowledge of their subjects are less bound to fixed approaches and methods. They are able to vary and develop their teaching. They assign demanding tasks and encourage their students to think in abstract ways. Research on the subject of mathematics has shown that if teachers are uncertain in their subject knowledge, this may lead to poorer student performance."

Subject competence and pedagogical content knowledge are the point of departure for teaching a subject. Moreover, the teacher must understand principles of learning and be able to analyse the level and needs of students. The Committee finds that the most important requirement for quality in education is what the teacher does in the classroom. Improving teaching practice is difficult. It is demanding to change routines and habits, but the greatest impact on quality development is when teachers test and evaluate new ways of teaching.[25] The profession must therefore work together to acknowledge that high quality differentiated instruction is needed.

Much of the input the Committee has received suggests that the level of knowledge about students with higher learning potential is so low that some teachers have a need for in-depth knowledge which can then be disseminated in the school. The Committee recognises that teachers with special competence are needed in every school – or with each school owner – with special competence in identifying and differentiating instruction for students with higher learning potential. The Committee finds that it may be useful to have a resource person available during a transition period until all the teachers have acquired the necessary competence relating to

[23] *Rektorutdanningen* is a state-funded further education and continuing professional development (CPD) programme for heads of school and school leaders in primary and secondary education and training

[24] *Ministry of Education and Research* 2014, p. 16

[25] Wiliam 2014

### Box 7.2 The Oslo School's measures for students with higher learning potential

*Schools are encouraged to exploit the options they have*

Section 8-2 of the Education Act and other relevant rules in the Education Act and Regulations, including the distribution of subjects and tuition periods, provide schools with many opportunities to differentiate organisationally and academically. The schools in Oslo are encouraged to exploit the options they find in the Education Act to adapt teaching to students with higher learning potential, and other students. Organisational differentiation in the regular instruction and various forms of time-limited level-distributed instruction, such as courses, are used to strengthen students' mastering and academic development.

*Skipping classes/moving ahead and talent programmes in the Oslo School*

All students should be given instruction on their level. Students in primary school with special talent in some subjects should have the opportunity to finish the primary school subject before they reach the final year – year 10. Students in lower secondary school and upper secondary education are offered teaching programmes on higher levels in natural science subjects and languages. Students in lower secondary school and upper secondary education who need extra challenges are offered teaching programmes on higher levels in natural science subjects and languages. A total of 255 students in lower secondary school, mainly students in year 10, completed English or mathematics on the upper secondary level with overall achievement grades or final examination grades in the 2015–2016 school year. Students may continue to move ahead in upper secondary education, and this means that this year students in lower secondary school and students in the first year of upper secondary education can already complete mathematics on the upper secondary education level.

Oslo local authority, represented by the Oslo Education Authority, cooperates with the University of Oslo (UiO) on a special programme in mathematics[1] for students in upper secondary education. The students attend teaching in UiO in the afternoon and may sit for examinations that can be incorporated into a university degree.

Special programmes have been initiated for in-depth studies in mathematics for students in year 8 and year 9 with high competence and special interest in the subject. This if offered in selected primary and lower secondary schools after regular school hours for two hours a week. As a part of the Summer School, Oslo students may participate in advanced courses in natural science subjects at the University of Oslo.

*Other programmes for high achieving students*

Various alternative education models have been implemented in upper secondary education, where one of the aims is to recruit students with the abilities to reach further than the standard for the regular learning pathway. One of these models is a four-year course leading to vocational competence and qualification for admission to university and college (YSK) in the programme areas building and construction and health and social services at Kuben upper secondary school. Pilot projects have been held at Hersleb Upper Secondary School with a two-year course specialising in general studies.

*Courses for teachers about students with higher learning potential*

The Education Authority arranges courses on special topics for teachers in the Oslo School. An example is schooling for teaching trainers and teacher specialists. Here the participants attend a special course with practical examples of how to identify students with higher learning potential, the learning needs they have and how, when working with them, the teachers can differentiate the instruction so that these students can reach their learning and development potential. Knowledge about this group of students will also be embedded in leadership training.

Source: Oslo Education Agency

[1] This programme is also offered to students in Akershus County

this group of students. This should be considered in conjunction with alternative career paths for teachers, testing out the teacher specialist scheme and other measures in *Lærerløftet [Raising teachers]*.[26] Differentiated instruction for all students with higher learning potential should be included in further education and continuing professional development (CPD) for teachers in all subjects. Teachers who acquire knowledge about students with higher learning potential must be included in the school leaders' plan for professional development for all teachers. This means setting aside time to observe teaching, and to guide and present knowledge to colleagues.

Based on input to the Committee during its work, it is necessary to clarify that teachers are expected to have:

- Knowledge about what characterises students with higher learning potential
- Knowledge about the importance of and how to prepare differentiated instruction for *all* students
- Knowledge about:
  - Principles of learning
  - Identification and acknowledgement
  - Organisational differentiation
  - Educational differentiation
- The ability to transform knowledge into practice and test methods that can improve student learning
- The ability to establish systems for tracking progression and development
- Good dialogues in the school-home cooperation about the student's learning and development

Measures to support the teacher. They need:

- Clarification and specification of who the stakeholders around the teacher are
- Mapping tools, guidance material and resources supporting the work with the items mentioned above
- Further education and continuing professional development (CPD)

## 7.2 Cooperation across institutions

One of the requirements the research summary has pointed out concerns cooperation across institutions.[27] Cooperation between professions and institutions on identifying students with higher learning potential is necessary, and in addition to this it is also necessary to develop and plan teaching measures for this student group. Cooperation across institutions will make it possible to exploit the available options, the opportunities and the competence that are found across the professions in the sector.[28] The core duties of teachers are teaching, assessment and preparation and follow-up work connected to the instruction they give. But there are also a host of tasks in school requiring competence possessed by other professional groups than teachers. Many of these tasks concern the school's psycho-social environment and challenges individual students may have. The need for special teaching, social-pedagogical and health-service competence in school is high. Other vocational groups must satisfy important competence requirements and support functions in the school's daily affairs.

### *Cooperation on improving the student's total situation*

Students and teachers express concern about the performance pressure many students experience in primary/lower secondary school and upper secondary education. This performance pressure is the result of values and expectations students experience both in and outside school.[29]

One study has shown that the students who experience the greatest pressure, regardless of school performance, report more depression, greater fatigue and lower self-efficacy than other students. This means that the increasing performance pressure in school has negative consequences for the mental health of many students.[30]

The Committee has received input from school counsellors who talk about the importance of different professions and persons cooperating so that students – including high achieving students – have a good total situation which served as the foundation for a healthy learning culture: "Talented students create a greater need for health services. They are super-stressed and afraid of not getting 6 [the highest grade] in all subjects. The stress about grades stems from the concern that getting less than the best grade may lower their overall average grade, thus closing some doors to tertiary studies."

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[26] *Ministry of Education and Research* 2014

[27] Relevant institutions may be schools, Statped, competence centres, the PPS, the BUP, companies. associations, the public health clinics

[28] Børte et al. 2016

[29] Skaalvik and Federici 2015

[30] Skaalvik and Federici 2015

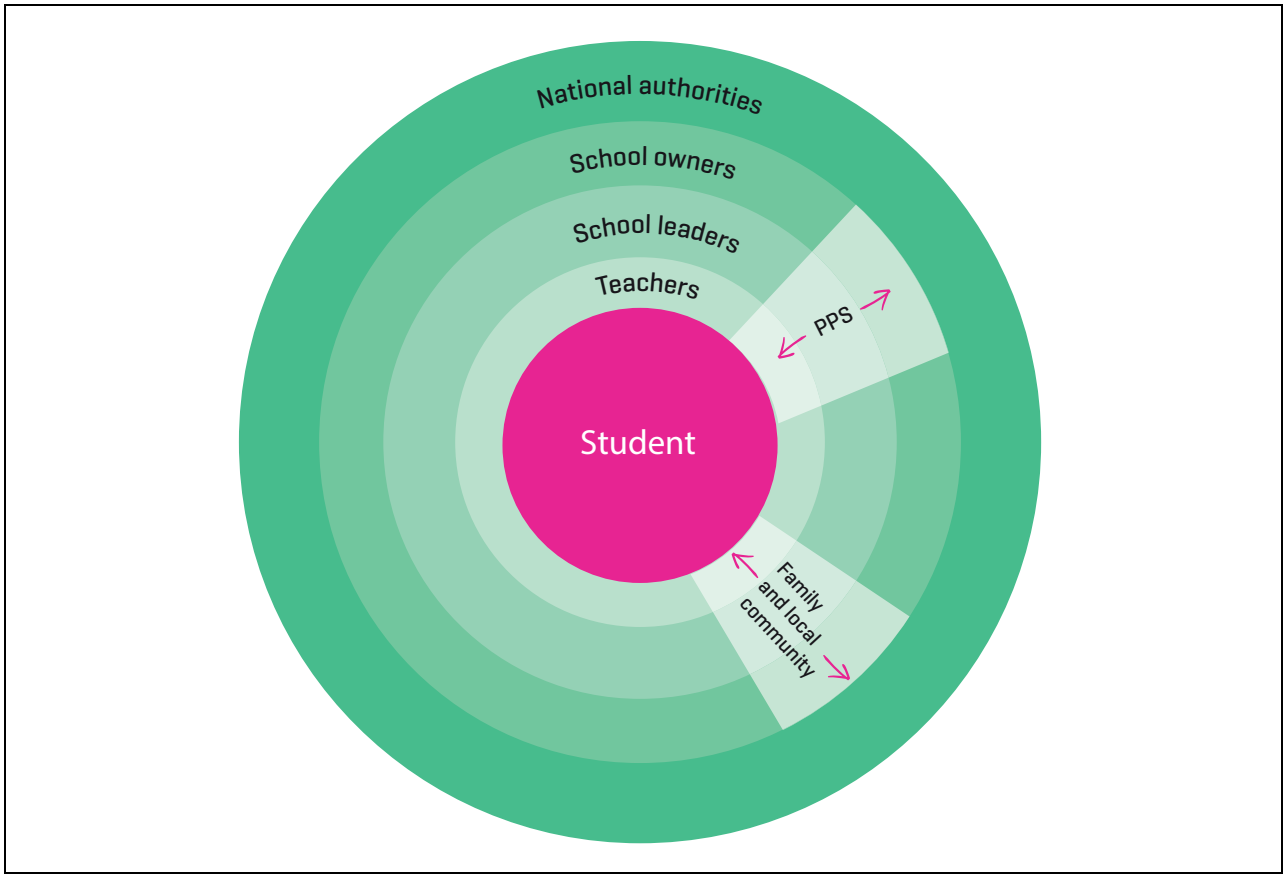


Figure 7.6 To ensure quality assessments related to the student's learning and development, persons and institutions working with the student must satisfy their roles, assume responsibility and interact.

Cooperation across institutions will strengthen the dialogue about and with students so that they are able to realise their learning potential in a positive learning environment (Figure 7.6).

*Cooperation between school and the PPS*

The Committee has received much input on the need for closer and better cooperation between school and the PPS, and many teachers would like more guidance and support. Both school and the PPS state that they need more knowledge about students with higher learning potential, and how to differentiate the instruction for these students, see Chapter 5.

*Communication across institutions*

To ensure cooperation across institutions there must be an exchange of information and communication across institutions. For example, a good starting point for cooperation on the development needs for students with higher learning potential across school years could be joint development of individual learning plans, follow-up plans or action plans.

In cases involving acceleration – such as when a student moves ahead a year in school, or follows the teaching in some subjects on a higher level – the teachers in primary school may need to cooperate with teachers in lower secondary school, or teachers in lower secondary school may need to cooperate with teachers in upper secondary education. Cooperation between teachers across primary school, lower secondary school and upper secondary education will also support the transition for students from one school stage to the next. These may be critical phases for the students, and cooperation and dialogue about student needs will be particularly important.

*Good transitions*

Good transitions between school levels and flexible infrastructure are decisive for the students' perception of the learning environment. This requires good systems for the cooperation between day-care institutions and school and between the local and county authorities. Cooperation and dialogue with the home and the student him- or herself must be included in the work on positive transitions.[31]

The Quality Framework[32] states that the cooperation between day-care institutions and school and between the main stages in school should be systematic to ease the transitions in the learning pathway. Early identification is important for the child's stay in the day-care institution, socialisation with peer groups and transition from day care to school. If children with higher learning potential are discovered and identified while in day care, teachers in year 1 can provide differentiated instruction and lay the foundation from which the students may exploit and develop their potential. In this way, teachers can prevent students from losing their motivation along the learning pathway, or from becoming part of the von-completion statistics in upper secondary education: "From the first day of school our school considers one thing: We must do our bit to prevent students from dropping out in upper secondary education; what I do today will help my students in 11 years." (Input from a teacher in the first year of primary school).

Students with higher learning potential are a socially vulnerable group the school must address in a proper and caring just as it must do for all the other students. By developing a system of concepts and mapping tools, the school will have options in identifying students with higher learning potential and the possibility to cooperate across institutions based on a common understanding and approach.[33]

Previous knowledge reviews have shown that a common project or object to cooperate on is important for productive cooperation across institutions and professions.[34]

The Committee realises that if the cooperation between schools and other institutions is to be improved, the PPS, school counselling service and school health service must have sufficient resources and more knowledge about this student group.

## 7.3 Quality in processes and realisation of excellent learning environments

The Committee agrees that there is no simple path to the goal that all students with higher learning potential will have a better school programme and achieve on high and advanced levels. The path to be taken involves long-term work with quality development to create excellent learning environments for all. It requires quality implementation working with a keen focus on changing the situation, which the Committee has formulated as the three systemic acknowledgements in the Committee's main message (Chapter 1).

The research summary refers to implementation studies which claim that well-considered and effective implementation strategies on several levels are essential for any systematic attempt use research knowledge in practice. Implementation consists of a set of complex activities, and it is therefore impossible to conclude this report with a universal recipe for how to carry out processes and introduce measures.[35] Meta-studies of implementation research used in the evaluation of the Knowledge Promotion curriculum[36] showed that sustainable and systemic reforms require good links between the various governance and administrative levels. Important systemic connecting lines are:

- Dialogue and partnership between the levels
- Common understanding of the reform between stakeholders on all levels
- A clear and pervasive accountability regime
- Acceptance of the goals of the reform and confidence in the reform's measures and tools on underlying levels
- Financial and political support and incentives
- Competence development on the operative level
- Local leadership and commitment from school owners, teachers and local politicians
- Trust between the stakeholders on and between the various levels
- Connecting new measures and established practice[37]

The Committee believes that these requirements must be satisfied if good intentions are to translate into good practice.

## 7.4 Summary and assessment

The Committee finds that it is first through an excellent learning environment that all students will be ensured optimal conditions for learning and development. This requires comprehensive professional cooperation and leaders who are

[31] *Ministry of Education and Research* 2016b
[32] *Ministry of Education and Research* 2006
[33] Børte et al. 2016
[34] Lillejord et al. 2015
[35] Børte et al. 2016
[36] Aasen et al. 2012, p. 18
[37] Aasen et al. 2012, p. 18

closely involved in the students' and teachers' learning. Expectations, support, cooperation and dialogues are needed on all levels in the education sector. Implementation of the recommended measures in this context therefore relies on systematic quality development.

The Committee recommends that school owners ensure that capacity is built in individual schools and between schools so that work is undertaken systematically to follow up students with higher learning potential.

Teacher competence is important for the quality of the instruction, and the Committee recommends that an expansion of the teacher specialist programme should be considered with a view to increasing the knowledge about students with higher learning potential and ensuring that the school has specialised subject competence. The Committee also recommends that the national authorities must ensure that differentiated instruction for students with higher learning potential is a topic in:

- School owner training and teacher training and special-needs training, and PPS education
- Further education and continuing professional development (CPD)

Moreover, the Committee recommends that the national authorities must ensure that competence programmes are developed for the PPS and special-needs teaching institutions relating to learning difficulties for children and young persons with higher learning potential.

If all students are to realise their full learning potential, a network of enhanced connections must be established in all directions in the education system: between research, teacher training, school owners, school leaders and the teaching practice. The different educational stages, from day care to higher education, must be closely coordinated. This will not only benefit students with higher learning potential, but contribute to an improvement in quality for *all* students. The Committee sees this as a complex task that can best be satisfied with knowledge, competence and a common vision of the goal shared by the various stakeholders in primary and secondary education and training. Students with higher learning potential need to be offered differentiated instruction that can help them to realise their learning potential.

# Chapter 8
# Financial, administrative and other consequences

The mandate instructs the Committee to examine the recommendations and financial consequences of the proposed measures, in addition to other matters dealt with in the chapters above:

> "The Committee must assess facts and background, and propose concrete measures so that more students can perform on high and advanced levels in primary and secondary education and training and so that high achieving students have better instruction in school. The Committee must assess and propose recommendations relating to how a varied and differentiated teaching programme for high achieving students can be provided within the regular school, but also assess special educational measures especially targeting the group or individual students. The Committee must assess organisational, educational, didactic, social, legal and financial aspects. [..] At least one of the Committee's recommendations must be financially viable within today's funding framework."

The Committee has analysed the recommendations and assessed which measures will impact the objective in the mandate to the greatest possible degree. The Committee finds that the recommendations are interrelated and that all in all they will provide better differentiated instruction for students with higher learning potential.

Basically, the schools must provide differentiated instruction to all students – including those with higher learning potential – and the goal in the mandate may therefore be considered a requirement that can be directly addressed to school owners with respect to realising this within today's administrative and financial framework. The Committee sees, however, the need for measures in the short and long term to increase knowledge about this group of students, and to increase the competence of school owners, school leaders, teachers and PPS employees. The need for competence development relating to students with higher learning potential and how to differentiate instruction for them, is a consistent need, one that has also been clearly stated to the Committee by all the stakeholders. There is a need to change practices in the schools.

The conditions for ensuring better instruction for students with higher learning potential, as formulated in this report, require that the national authorities prioritise this issue, provide examples of practice, clarify the options that are available to the stakeholders and stimulate cooperation between research environments, teacher training institutions and schools. This requires financial and administrative resources.

In the assessment of possible consequences, the Committee points out that the consequences are greater if measures are *not* implemented for students with higher learning potential. The negative consequences of not changing the instruction to satisfy the needs of students with higher learning potential are comprehensive and acute for the individual student and society.

## 8.1 Overarching review of financial consequences

The Committee's recommendations do not primarily refer to the need for more funding. A number of the Committee's recommendations will, nonetheless, when seen in isolation, introduce the need for increased funding. The assessment finds, however, that substantial synergies can be achieved in the total resource use, so that the total costs may be kept within the current financial framework. The Committee's task, however, did not include the provision of a complete plan for implementing the recommendations. Accordingly, the Committee does not provide detailed estimates or propose funding possibilities in connection with all the recommendations.

Primarily, the degree of ambition and the scope of the measures that the authorities decide to implement will determine the size of the cost framework.

We have chosen to divide the recommendations into two different lists. The first list comprises the measures we believe may be realised within today's resource framework. The second list comprises measures which will require extra funding to be implemented.

### 8.1.1 Recommended measures which can be implemented within today's resource framework

*The national authorities:*

- Amend section 1-3 of the Education Act to clarify that the legal provision also includes students with higher learning potential.
- Clarify the options available to school leaders, school owners and County Governors in the current rules, for example through national competence development measures, such as *Regelverk i praksis* [Rules in practice] and *RefLex*.
- Ensure that the progression descriptors in the guidelines for the subject curricula provide examples of competence on high and advanced levels and support the teacher's work to differentiate the instruction for students with higher learning potential. The descriptors must be developed in conjunction with the subject renewal in the Knowledge Promotion curriculum.
- Concentrate resources on research dedicated to this student group. Critical factors are strong research environments and a stronger link between research, teacher training institutions and school to influence practice in the classroom.
- Ensure that research is coordinated and presented to the sector.
- Assess measures to ensure that school owners cooperate with and take responsibility for procedures for skipping a year/moving the students in question ahead.
- Ensure that differentiated instruction for students with higher learning potential is included as a topic in national projects and guidance material.
- Ensure that differentiated instruction for students with higher learning potential is included in:
  - School-leader training, teacher training and education of special-needs teaching, and education for the PPS
  - Further education and continuing professional development (CPD)

*The school owners:*

- Build capacity in individual schools and between schools so that work is systematically undertaken to follow up the students' learning.
- Take responsibility for ensuring that schools and the PPS have competence in and resources for identifying students with higher learning potential and differentiate the instruction for them.

*The school leaders:*

- Use existing research and facilitate for flexible organisation of students with higher learning potential.

*Teachers:*

- Apply research-based knowledge and vary teaching methods, for example through in-depth learning and enrichment.

### 8.1.2 Recommended measures which may require extra funds to be implemented

*Research environments:*

- Carry out high quality research on students with higher learning potential in close connection and cooperation with teacher training institutions and schools.

*The national authorities:*

- Ensure that digital learning resources are developed for students to provide better in-depth learning in all subjects.
- Ensure development and use of an e-learning module for schools and the PPS and increase competence about students with higher learning potential.
- Assess expanding the teacher specialist programme to include knowledge about students with higher learning potential.
- Develop knowledge-based mapping and guidance material for identifying purposes and for proposing didactic techniques in subjects for schools, the local authorities and the PPS.
- Ensure that competence programmes for the PPS and special-needs teaching institutions are developed on the learning difficulties of children and young persons with higher learning potential.

– Systematically map and evaluate effects of measures for students with higher learning potential every four years.

### 8.1.3 The Committee's assessment of the financial and administrative consequences of the measures

Below the Committee will give expense estimates for some of the recommendations we believe can be initiated quickly. We remind readers that the size of the expenses is dependent on the ambition level.

*Development of knowledge-based mapping and guidance material for identifying and proposing didactic techniques for the subjects* should be assigned to the Norwegian Directorate for Education and Training, which in turn will involve the national centres and relevant research environments. The Committee sees that in the development of didactic techniques it may be best to start with a number of subjects, such as English, mathematics, natural science, Norwegian and social studies. In following up the Report to the Storting no. 28 (2015–2016) resources should be developed which clarify and exemplify how the revised subject curricula can realise progression for students with higher learning potential. The Committee estimates costs at NOK 5 million in 2017.

*Development of an e-learning module for teachers to raise competence on students with higher learning potential* should be assigned to the Norwegian Directorate for Education and Training. The directorate must ensure the quality of the module, and that the educational and technology environments can work together to develop training modules that can be used by schools and the PPS across the entire country. The Committee believes that the module should be based on experiences from school-based MOOC[1], where the point of departure is that all the staff should use e-learning in their development activities. The Committee finds that a reasonable cost estimate is NOK 20 million in 2017.

*Concentrating resources on research focusing on students with higher learning potential* refers to the concentration of resources on research environments able to design research that will be the impetus for significant changes in the practice in school. The Committee finds that it is extremely important how the research environments interact with the practice field before, during and after the research. The research must be perceived as relevant for school leaders and teachers, and results and findings must be made available to the schools. The national authorities should ensure that the research projects are coordinated so they can benefit schools and students across Norway. Research funding will have to be granted and there will be some administration resources. The Committee does not set a cost estimate for this as it depends on the ambition level.

*Developing digital learning resources for students which, for example, provides in-depth learning in all subjects may be assigned to the Centre* for ICT in Education or the Norwegian Directorate for Education and Training, which in turn must involve the relevant environments. The Committee believes it is important to use experiences from *Den virtuelle matematikkskolen* [the *Virtual Mathematics School*] and extend this to additional subjects. The Committee does not set a cost estimate here as it depends on the ambition level.

## 8.2 Summary and priorities

In the introduction to the report the Committee presented three systemic acknowledgments, and this report is intended to give direction to what should be done to change today's situation for students with higher learning potential as formulated in these acknowledgements, cf. Chapter 1. We have made a number of recommendations to ensure that more students will achieve on a high and advanced level, and so that students with higher learning potential will have a better everyday experience in school and thus be able to realise their potential. We consider all the recommended measures to be important, and they must be considered holistically, but we also find some measures more important than others. There are long-term and short-term measures, as shown in the report, and some will be more complex and harder to realise than others. Common to all the recommendations is that they support the main idea that differentiated instruction, excellent learning environments and collective professional development are what is needed to satisfy the goals for students with higher learning potential.

The Committee particularly wants to point out the recommendations for raising the knowledge level of teachers and the PPS. This will satisfy a great need, and the Committee believes that knowledge influences attitudes and cultures in schools. The most important element is that

[1] The national project *Vurdering for læring* [Assessment for learning] has developed and offers a school-based MOOC (Massive Open Online Course).

teachers have competence in differentiating the instruction and always have the student's learning as their point of departure for planning, implementing and evaluating their teaching.

What then should be going on in the Norwegian classrooms after the recommendations in the report have been implemented? Will we be able to see the effects of this report in ten years? It would of course have been ideal to produce an itemised recipe for how more students can achieve on high and advanced levels, and how students with higher learning potential may have a better school experience, in addition to supplying a set of accompanying descriptors for evaluating whether the measures have yielded the intended result. Such a recipe with its accompanying measuring tools does not exist. In the end, the answer is not about isolated measures alone, but rather about quality in all parts of the instruction. It is about creating and developing a culture for learning. Various factors influence student development, and it is difficult to distinguish these factors from each other to ensure that what is measured actually supplies answers to the questions that have been asked. It is challenging to measure cultural changes. The Committee recommends that every four years the national authorities systematically map and evaluate the effects of measures for students with higher learning potential.

Various sources, such as the Student Survey, examination results, national tests, the Parent Survey and international studies, together with the insights of each school into the students' learning, will provide important information that we will need to assess when determining if we have satisfied the goals.

# Chapter 9
# References

Aasen, A. M., Nordahl, T. Mælan, E.N., Drugli, M.B. and Myhr, L. (2014). *Relasjonsbasert klasseledelse. Et komplekst fenomen [Relationsbased classroom management. A complex phenomenon]*. Assignment report, Hedmark University of Applied Sciences. Downloaded from: http://www.udir.no/globalassets/filer/tall-og-forsk-ning/forskningsrapporter/relasjons-basert-klas-se-ledelse-hihm-00000002.pdf (Read: 06/12 2015).

Aasen, P., Møller, J., Rye, E., Ottesen, E., Prøitz, T. S. and Hertzberg. F. (2012). *Kunnskapsløftet som styringsreform – et løft eller et løfte? Forvaltningsnivåenes og institusjonenes rolle i implementeringen av reformen [The Knowledge Promotion curriculum as a governance reform – promotion or promise? The roles of the administrative levels and institutions in the implementation of the reform]*. NIFU Report 20/2012. Oslo: NIFU.

Afdal, W. H. (2012). *Constructing knowledge for the teaching Profession. A comparative analysis of policymaking, curricula content, and novice teachers' knowledge relations in the cases of Finland and Norway.* Oslo: University of Oslo.

Anmarkrud, Ø. and Bråten, I. (2012). *Naturally-Occurring Comprehension. Strategies Instruction in 9th-Grade Language Arts Classrooms.* Scandinavian Journal of Educational Research.

Bachmann, K. and Haug, P. (2006). *Forskning om tilpasset opplæring* [Research on differentiated instruction]. Research report no. 62. Downloaded from: http://www.udir.no/Upload/Forskning/5/Tilpasset_opplaring.pdf (Read 06/12 2015).

Bailey, R., Pearce, G., Smith, C., Sutherland, M., Stack, N., Winstanley, C. and Dickenson, M. (2008). *A systematic review of interventions aimed at improving the educational achievement of students identified as gifted and talented.* London: EPPI-Centre, Social Science Research Unit, Institute of Education, University of London. Downloaded from: http://eppi.ioe.ac.uk/cms/LinkClick.aspx?fileticket=9e5l5LRWx3c%3d&tabid=2402&portalid=0&mid=4458 (Read 06/12 2015).

Bailey, R., Pearce, G., Smith, C., Sutherland, M., Stack, N., Winstanley, C. and Dickenson, M. (2012). Improving the educational achievement of gifted and talented students: A systematic review. *Talent Development & Excellence*, 4(1), p. 33–48.

Bakken, A. (2010). *Prestasjonsforskjeller i kunnskapsløftets første år — kjønn, status og foreldres utdanning [Achievement differences in the first year of the Knowledge Promotion curriculum]*. [Report 9/2010] Oslo: NOVA.

Bakken, A. (2014). *Ulike perspektiver på skoleresultatene til barn og unge med innvandringsbakgrunn [Different perspectives of school achievements for children and youths with immigrant backgrounds]*. Oslo: NOVA.

Black, P., Harrison, C., Lee, C., Marshall, B. and Wiliam, D. (2006). *Assessment for learning: putting it into practice.* Berkshire: Open-University Press.

Blåsmo, T. (11.06.16). Vil satse på evnerike elever. [Want to focus on gifted children] *Budstikka*. Downloaded from: http://www.budstikka.no-/evnerike-elever/skole/lommedalen/vil-satse-pa-evnerike-elever/s/5-55-326659 (Read 12/06 2016).

Boaler, J., Wiliam, D. and Brown, M. (2000). Students' experiences of ability grouping disaffection, polarization and the construction of failure. *British Educational Research Journal, 26 (5), 631.648.*

Bordvik, M. (07.08.2013). Flytter familien til Danmark fordi datteren får for lite utfordring i norsk skole. [Moving the family to Denmark because their daughter is not challenged in the Norwegian school] *Aftenposten*. Downloaded from: http://www.aftenposten.no/norge/Flytter-familien-til-Danmark-fordi-datteren-far-for-lite-utfordring-i-norsk-skole-112736b.html (Read 12/01 2016).

Brandmo, C. (2014). Metakognisjon og selvregulert læring [Metacognition and self-

regulated learning]. In Stray, J. H. and Wittek, L. (ed.). *Pedagogikk — en grunnbok.* Oslo: Cappelen Damm AS.

Brevik, L. M. and Gunnulfsen, A. E. (2016). Differensiert undervisning for høytpresterende elever med stort læringspotensial [Differentiated instruction for high achieving students with higher learning potential]. *Acta Didactica Norge* Vol. 10, No. 2, 212–234.

Bunting, M. (2015). *Tilpasset opplæring: i forskning og praksis [Differentiated instruction: In research and practice]*. Oslo: Cappelen Akademisk.

Bærum kommune. (2015). *Evnerike barn og unge i Bærumsskolen [Gifted children and youths in schools in Bærum]*. Downloaded from: www.baerum.kommune.no/globalassets/tjenester/skole/digital-ressursperm-om-evnerike-elever-290415.pdf (Read 06/11 2015).

Børte, K., Lillejord, S. and Johansson, L. (2016). *Evnerike elever og elever med stort læringspotensial: En forskningsoppsummering [Gifted students and students with higher learning potential: A research summary]*. Oslo: Kunnskapssenter for Utdanning.

Caspersen, J., Aamodt, P. O., Vibe, N. and Carlsten, T. C. (2014). *Kompetanse og praksis blant norske lærere. Resultater fra TALIS-undersøkelsen i 2013 [Competence and practice among Norwegian teachers. Results of the TALIS survey in 2013]*. [Report 41/2014] Oslo: NIFU.

Clark, B. (2012). *Growing Up Gifted: Developing the Potential of Children at School and at Home.* Los Angeles: Pearson Publishing House.

Cooke, S. F. and Bliss, T. V. P. (2006). Plasticity in the human central nervous system. *Brain*, *129*(7), 1659–1673.

Csikszentmihaly, M. (1996). *Creativity. Flow and the Psychology of discovery and innovation.* New York: Harper Perennial.

Daal, V. v., Solheim, R. G., and Gabrielsen, N. N. (2011). *Godt nok? Norske elevers leseferdighet på 4. og 5. trinn PIRLS 2011 [Good enough? The reading skills of Norwegian students in year 4 and year 5 PIRLS 2011]*. Stavanger: University of Stavanger/Lesesenteret.

Danish Ministry of Children, Education and Equality. (2016). *Understøttende undervisning [Supportive teaching]*. Downloaded from: http://www.uvm.dk/Uddannelser/Folkeskolen/Laering-og-laeringsmiljoe/Understoettende-undervisning (Read 06/04 2016).

Dumont, H. and Istance, D. (2010). Analyzing and designing learning environments for the 21st century. In Dumont, H. Istance, D. and Benavides, F. (ed.). *The Nature of Learning. Using research to inspire practice*. Paris: OECD Publishing.

Dweck, C. S. (2006). *Mindset: The new psychology of success*. New York: Random House.

Dælien, M. and Eriksen, I. M. (2015). *Det tenner en gnist. Evaluering av valgfagene på ungdomstrinnet [Lighting a spark. Evaluation of the electives in lower secondary school]*. [Report 2/2015] Oslo: NOVA.

Education Scotland. (2015a). *Personalised learning. Transforming lives through learning.* Downloaded from: www.educationscotland.gov.uk/Images/PersonalisedLearning3_tcm4-871710.pdf (Read 06/12 2015).

Education Scotland. (2015b). *How good is our School? 4th Edition.* Downloaded from: www.educationscotland.gov.uk/Images/HGIOS4_tcm4-870533.pdf (Read 06/12 2015).

Eurydice. (2006). *Specific Educational measures to promote all form of giftedness at school in Europe. Working paper.* European Commission. Downloaded from: http://www.indire.it/lucabas/lkmw_file/eurydice/Specific_measures_giftedness_EN.pdf (Read 06/12 2015).

Feldhusen, J. F., Dai, D. Y. and Clinkenbeard, P.R. (2000). Dimensions of competitive and cooperative learning among gifted learners [Electronic version]. *Journal for the Education of the Gifted, 23,* 328–342.

Fiskestrand, Å. and Rimeslåtten, E. (2009). *Veien til toppidrett [The road to elite sports]*. Oslo: Gyldendal.

Freeman, J. (1998). *Educating the Very Able.* London: The Stationery Office.

Freeman, J., Raffan, J. and Warwick.I (2010). *Worldwide provision to develop gifts and talents. An international survey.* Downloaded from: http://joanfreeman.com/pdf/towereport2.pdf (Read 06/12 2015).

Fullan, M. (2011). *Change Leader – Learning to do what matters most*. San Francisco: Jossey-Bass.

Gagné, F. (2005). From gifts to talents: The DMGT as a developmental model. In Sternberg, R. J. and Davidson, J. E. (ed.). *Conceptions of giftedness* (pp. 98–119). New York: Cambridge University Press.

Gamlem, S., M. (2015). *Tilbakemelding for læring og utvikling [Feedback for learning and development]*. Oslo: Gyldendal Akademisk.

Gaze, R. M., and Taylor, J. S. H. (1987). *Plasticity in the nervous system.* The Oxford Companion to the Mind, Oxford University Press, Oxford, 623–628.

Gilje, Ø., Ingulfsen, L., Dolonen, J. A., Furberg, A, Rasmussen, I., Kluge, A., Knain, E., Mørch, A., Naalsund, M. and Skarpaas, K. G. (2016). *Med ARK og APP 2016 – Bruk av læremidler og ressurser for læring på tvers av arbeidsformer [With ARK and APP 2016 – The use of teaching aids and resources across work forms]*. Oslo: University of Oslo. Downloaded from: http://www.uv.uio.no/iped/forskning/prosjekter/ark-app/arkapp_syntese_endelig_til_trykk.pdf (Read: 06/04 2016).

Gjerustad, C. and Waagene, E. (2015). *Spørsmål til skole – Norge våren 2015. Resultater og analyser fra Utdanningsdirektoratets spørreundersøkelse blant skoler og skoleeiere [Questions for school sstakeholders in Norway in the spring of 2015. Results and analyses from the Norwegian Directorate for Education and Training's questionnaire sent to schools and school owners]*. Report 19/2015. Oslo: NIFU.

Gjone, G. and Onstad, T. (ed.). (2000). *Mathema 2000. Festskrift til Ragnar Solvang [Publication in honour of Ragnar Solvang]*. Oslo: NKS-Forlag.

Gottfried, A. E., and Gottfried, A. W. (1996). A longitudinal study of academic intrinsic motivation in intellectually gifted children: Childhood through adolescence. *Gifted Child Quarterly*. 40, 179–183.

Greeno, J. G. (2006). Learning in activity. In Sawyer, K (ed.). *Handbook of the Learning Sciences.* Cambridge: Cambridge University Press.

Gross, M.U.M. (2004). *Exceptionally gifted children (2nd edition)*. London: Routledge Farmer.

Grønmo, L. S., Jahr, E., Skogen, K and Wistedt, I. (2014). *Matematikktalenter i skolen – Hva med dem? [Mathematics talented students in school – what about them?]* Oslo: Cappelen Damm Akademisk.

Grønmo, L. S., Onstad, T. and Pedersen I. F. (2010). *Matematikk i motvind. TIMSS Advanced 2008 i videregående skole [Mathematics in a headwind. TIMMS Advanced 2008 in upper secondary school]*. Oslo: Unipub.

Grønmo, L. S., Onstad, T., Nilsen, T., Hole, A., Aslaksen H. and Borge I. C. (2012) *Framgang, men langt fram. Norske elevers prestasjoner i matematikk og naturfag i TIMSS 2011 [Progress but a long way to go. The achievements of Norwegian students in mathematics and natural science in TIMSS 2011]*. Oslo: Akademika forlag.

Grønmo, L.S. and Onstad T. (ed.). (2012). *Mange og store utfordringer. Et nasjonalt og internasjonalt perspektiv på utdanning av lærere i matematikk basert på data fra TEDS-M 2008 [Many and great challenges. A national and international perspective on educating teachers in mathematics based on data from TEDS-M 2008]*. Oslo: Unipub

Hatlevik, O. E. and Throndsen, I. (2015). *Læring av IKT. Elevenes digitale ferdigheter og bruk av IKT i ICILS 2013 [Learning ICT. The digital skills of students and the use of ICT in ICILS 2013]*. Oslo: Universitetsforlaget.

Hattie, J. (2009). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement.* New York: Routledge.

Hattie, J. and Timperley, H. (2007). *The Power of Feedback*. In *Review of Educational Research.* 77 (1).

Heller, K. A., Perleth, C. and Lim, T. K. (2005). The Munich Model of Giftedness Designed to Identify and Promote Gifted Students. In Sternberg, J. R. and Davidson, J. E. (ed.). *Conceptions of Giftedness.* Second Edition. Cambridge: USA.

Hermann, S., Andersen, N. O., Birkving, K., -Egebjerg, J., Kingo., L., Hindsholm, S. and Wilbek, U. (2011). *Talentudvikling. Evaluering og strategi af Arbejdsgruppen til talentudvikling i uddannelsessystemet [Talent development. Evaluation and strategy by the Work Group for talent development in the development system]*. Downloaded from: http://www.uvm.dk/Uddannelser-og-dagtilbud/Vejledning/Fakta-om-vejledning/Nyheder-om-vejledning/~/UVMDK/Content/News/Udd/Folke/2011/Apr/~/media/UVM/Filer/Udd/Folke/PDF11/110414_Talentrapport_hele.ashx (Read 16/10 2015).

Hodgson, J., Rønning, W. and Tomlinson, P. (2012). *Sammenhengen mellom undervisning og læring. En studie av læreres praksis og deres tenkning under Kunnskapsløftet [The link between teaching and learning. A study of teacher practices and their thinking under the Knowledge Promotion curriculum]*. Bodø: Nordlandsforskning.

Hofset, A. (1968). *Evnerike barn i grunnskolen [Gifted children in primary school]*. Oslo: Universitetsforlaget.

Hopfenbeck, T. and Roe, A. (2010). Lese- og læringsstrategier [Reading and learning strategies]. In Kjærnsli, M. and Roe, A. (ed.). *På rett spor – norske elevers kompetanse i lesing, matematikk og naturfag i PISA 2009 [On the right path* – Norwegian students' competence in mathematics, natural science and reading in PISA 2009]. Oslo: Universitetsforlaget.

Hopfenbeck T. (2014). *Strategier for læring. Om selvregulering, vurdering og god undervisning [Strategies for learning. On self-regulation, assessment and good teaching]*.

Idsøe, E. C. and Skogen, K. (2011). *Våre evnerike barn [Our gifted children]*. Oslo: Høyskoleforlaget.

Idsøe, E. C. (2014a). *Elever med akademisk talent i skolen [Students with academic talent in school]*. Oslo: Cappelen Damm Akademisk.

Idsøe, E. C. (2014b). Tilpasset opplæring for elever med stort akademisk potensial [Differentiated instruction for students with high academic potential]. Bunting, M. (ed.) *Tilpasset opplæring i forskning og praksis.* Oslo: Cappelen Damm Akademisk.

Idsøe, E. C. (2015). Elever som allerede kan lese [Students who already are able to read]. *Bedre skole no. 2*, 2015. Downloaded from: https://www.utdanningsforbundet.no/upload/Tidsskrifter/Bedre%20Skole/BS_2-1015/UTD-BS0215-WEB_Idsoe.pdf (Read 06/12 2015).

Jahr, E. (2000). Matematikk på Mellomtrinnet [Mathematics for the upper primary level: grades 5-7 (age 10 to 12)] I G. Gjone & T. Onstad (Eds.), Mathema 2000 (s. 81–95). Oslo: NKS-forlaget.

Jang, H., Reeve, J. and Deci, E. L. (2010). Engaging students in learning activities: It is not autonomy support or structure but autonomy support and structure. *Journal of Educational Psychology*, 102(3), 588.

Jensen, F. and Nordtvedt, G. (2013). Holdninger til matematikk [Attitudes to mathematics]. In Kjærnsli M, and Olsen, R. V. (ed.). *Fortsatt en vei å gå. Norske elevers kompetanse i matematikk, naturfag og lesing i PISA 2012 [Still a way to go*. Norwegian students' competence in mathematics, natural science and reading in PISA 2012].

Jenssen, E. S. (2011). *Tilpasset opplæring i norsk skole. Politikere, læreres og lederes handlingsvalg [Differentiated instruction in the Norwegian school. The choices of action made by politicians, teachers and leaders]*. PhD treatise, University of Bergen: Faculty of psychology.

Jenssen, E. S. and Lillejord, S. (2009). *Tilpasset opplæring: politisk dragkamp om pedagogisk praksis [Differentiated instruction. political tug-of-war on educational practice]*. Oslo: Acta Didactica Norge.

Johansson, L. (2016). *Profesjonssamarbeid for å tilpasse opplæringen for evnerike elever [Professional cooperation to differentiate instruction for gifted students]*. Downloaded from: http://utdanningsforskning.no/artikler/profesjonssamarbeid-for-a-tilpasse-opplaringen-til-evnerike-elever/ (Read 22/06 2016).

Kyed, O. (2015). *De intelligente børn. Børn med særlige forudsætninger [The intelligent children. Children with special abilities]*. Copenhagen: Akademisk Forlag.

Lie, S., Angell, C and Rohatgi, A. (2010). *Fysikk i fritt fall? TIMSS Advanced 2008 i videregående skole [Physics in free fall TIMSS Advanced 2008 in upper secondary school]*. Oslo: Unipub.

Lie, B. (2016). *Begavede barn – i barnehagealder [Gifted children – of day care age]*. Oslo: Cappelen Damm Akademisk.

Lillejord, S., Børte, K., Halvorsrud, K., Ruud, E. and Freyr, T. (2015). *Tiltak med positiv innvirkning på barns overgang fra barnehage til skole. En systematisk kunnskapsoversikt [Measures influencing children's transition from day care to school. A systematic knowledge overview]*. Oslo: Norwegian Knowledge Centre for Education.

Malabou, C. (2009). *What should we do with our brain? (Perspectives in Continental Philosophy)*. USA: Fordham University Press.

Mathisen, A. R and Olsen, M. H. (2016). Den doble klassifiseringen [The double classification]. Olsen, M.H. (ed.) *Relasjoner i pedagogikken i lys av Baumans teorier*. Oslo: Universitetsforlaget.

McCoach, D. Betsy, and Siegle, Del. (2007). What Predicts Teachers' Attitudes Towards the Gifted. *Gifted Child Quarterly, 51*(3), 246–255.

McCoach, D.B., and Siegle, D. (2008). Underachievers. In Carolyn Callahan and Jonathan Plucker (ed.) *Critical issues and practices in gifted education* (pp. 721–734). Prufrock Press.

Mehlbye, J., Flarup, L. H., and Iversen, K. (2015). *Indsatser målrettet højt begavede børns faglige udvikling og trivsel [Efforts focusing on the academic development and well-being of highly gifted children]*. KORA: Denmark.

Midling, A. S. (2014). *Viktig med ulik undervisning for å dyrke talentene [Differentiated instruction is important for addressing the talented ones]*. (Interview with Edvard and May-Britt Moser). Downloaded from: http://gemini.no/2014/12/viktig-med-ulik-undervisning-for-a-dyrke-talentene/ (Read 06/04 2016).

Ministry of Education and Research. (2016a). *Forskrift til opplæringslova [Regulations under the Education Act]*. Oslo: *Ministry of Education and Research*.

Ministry of Education and Research. (2016b). *Veileder. Fra eldst til yngst – samarbeid og sammenheng mellom barnehage og skole* [Guide. From oldest to youngest – cooperation and connection between day care and school]. Oslo: *Ministry of Education and Research*.

Ministry of Education and Research. (2015). *Nytt utvalg om høyt presterende elever [New committee on high achieving students]*. Downloaded from: https://www.regjeringen.no/no/aktuelt/ekspertutvalg-om-karriereveiledning/id2403783/ (Read 06/10 2015).

Ministry of Education and Research. (2014). *Lærerløftet. På lag for kunnskapsskolen. Strategi [Raising teachers. Teaming up for the knowledge school. Strategy]*. Oslo: *Ministry of Education and Research*.

Ministry of Education and Research. (2013). *Veiledning om organisering av elevene. Opplæringsloven § 8-2 m.m. [Guide for organisation of students. Section 8-2 etc. of the Education Act]* Oslo: *Ministry of Education and Research*.

Ministry of Education and Research. (2006). *LK06, Læreplanverket for Kunnskapsløftet [LK06. The Knowledge Promotion curriculum]*. Downloaded from: www.udir.no/laring-og-trivsel/lareplanverket/ (Read 22/05 2016).

Ministry of Education, Research and Church Affairs. (1998). *Proposition to the Odelsting no. 46 (1997–98) Om lov om grunnskolen og den vidaregåande opplæringa (opplæringslova) [Act relating to primary and secondary education and upper secondary education (the Education Act)]*. Oslo: Ministry of Education, Research and Church Affairs.

Mishra, J and Koehler, M. J. (2006). *Technological pedagogical content knowledge: A framework for teacher knowledge.* Teachers College Record, 108(6), 1017–1054.

Mitchel, D. (2014). *Hvad der virker i inkluderende undervisning – evidensbaserede undervisningsstrategier [What works in inclusive teaching – evidence-based teaching strategies]*. Dafalo: Fredrikshavn.

Moon, S. M. (2012). Personal talent development revisited. In Subotnik., R. F. Robinson., A, Callahan., C. M. and Gubbins., E. J. (ed.), *Malleable minds: Translating insights from psychology and neuroscience to gifted education* (pp. 165–176). Storrs, CT: National Research Center on the Gifted and Talented.

Mönks, F. J. (1992). Development of the gifted child: The issue of identification and programming. In Mönks, F. J. and Peters. W. A. M. (ed.). *Talent for the future.* 191–202. Maastricht, The Netherlands: Assen.

Nissen, P., Kyed, O., Baltzer, K. and Skogen, K. (2012). *Talent i skolen* (Norwegian edition) [Talent in school (Norwegian edition)]. Namsos: Pedagogisk Psykologisk Forlag AS.

NOKUT. (2008). *Evaluering av ingeniørutdanningen i Norge i 2008. Sammendrag av viktige konklusjoner og anbefalinger [Evaluation of engineering education in Norway in 2008. Summary of important conclusions and recommendations]:* Downloaded from: http://www.nokut.no/Documents/NOKUT/Artikkelbibliotek/Norsk_utdanning/Evaluering/INGEVA/Rapporter/INGEVA_NOKUT_%20del%201%20Hovedrapport.pdf (Read 06/06 2016).

NOKUT. (2016a). *Høy strykprosent på nasjonal deleksamen i matematikk [High failure rate in the national sub-examination in mathematics]*: Downloaded from: http://www.nokut.no/no/Nyheter/Nyheter-2016/Hoy-strykprosent-pa-nasjonal-deleksamen-i-matematikk/#.V74HHU3VzIU (Read 26/06 2016).

NOKUT. (2016b). *Nasjonal deleksamen i matematikk for grunnskolelærerutdanningen [National sub-examination in mathematics for the training of teachers in primary and secondary education]* Downloaded from: http://www.nokut.no/no/Fakta/NOKUTs-publikasjoner/Oppsummeringer/Hoyere-utdanning/Nasjonal-deleksamen-i-matematikk-for-grunnskolelarerutdanningen/ (Read 26/06 2016).

Nordenbo, S., Larsen, M, Tiftikçi, N. Wendt, R and Østergaard, S. (2008). *Lærerkompetanse og elevers læring i barnehage og skole. Et systematisk review utført for Kunnskapsdepartementet [Teacher competence and students' learning in day-care institutions and school. A systematic review on assignment for the Ministry of Education and Research]*. Copenhagen: Danmarks Pædagogiske Universitetsforlag and Dansk Clearinghouse for Uddannelsesforskning.

Norwegian Directorate for Education and Training. (2016a). Website on *Tilpasset opplæring [Differentiated instruction]*. Downloaded from: http://www.udir.no/laring-og-trivsel/tilpasset-opplaring/ (Read on 01/06 2016).

Norwegian Directorate for Education and Training. (2016b). Website on *Vurderingspraksis [Assessment practice]*. Downloaded from: http://www.udir.no/vfl (Read 01/06 2016).

Norwegian Directorate for Education and Training. (2016c). *Circular Udir-01-2016 Fag- og*

*timefordeling og tilbudsstruktur for Kunnskapsløftet [Distribution of subjects and tuition periods and structure of subject programmes for the Knowledge Promotion curriculum]*. Downloaded from: http://www.udir.no/regelverk-og-tilsyn/finn-regelverk/etter-tema/Innhold-i-opplaringen/udir-01-2016 (Read 01/ 2016).

Norwegian Directorate for Education and Training. (2016d). *Utdannings-speilet. Tall og analyser av barnehager og grunnopplæringen i Norge [The education mirror. Numbers and analyses of day-care institutions and basic schooling in Norway]*. Downloaded from: http://utdanningsspeilet.udir.no/ (Read 01/06 2016).

Norwegian Directorate for Education and Training. (2016e). *Tilsyn med veiledning skaper endring. Fylkesmennenes tilsyn med opplærings- og barnehageområdet i 2015 [Supervision with guidance creates change. The County Governors' supervision of the education and day-care areas in 2015]*. Downloaded from: http://www.udir.no/globalassets/filer/regelverk/tilsyn/oppsummering-av-fylkesmannens-tilsyn-med-opplarings–og-barnehageomradet-i-2015.pdf (Read 01/06 2016).

Norwegian Directorate for Education and Training. (2015a). *RefLex – hjelp til å vurdere egen praksis [RefLex – assistance in assessing one's own practice]*. Downloaded from: http://www.udir.no/regelverk-og-tilsyn/tilsyn/egenvurdering/reflex/ (Read 01/06 2016).

Norwegian Directorate for Education and Training. (2015b). *Periodisering i fag med lokalt gitt eksamen (ploging). Tolkningsuttalelse [Periodization in subjects with locally given examinations. Statement on common understanding]*. Downloaded from: http://www.udir.no/regelverk-og-tilsyn/finn-regelverk/etter-tema/Innhold-i-opplaringen/periodisering-i-fag-med-lokalt-gitt-eksamen-ploging/ (Read 01/06 2016).

Norwegian Directorate for Education and Training. (2015c). *Hva er regelverk i praksis? [What are rules in practice]* Udirbeta. Downloaded from: http://udirbeta.udir.no/hva-er-regelverk-i-praksis/ (Read 01/06 2016).

Norwegian Directorate for Education and Training. (2014). *Veilederen Spesialundervisning [The Special Teaching Guide]*. Downloaded from: http://www.udir.no/laring-og-trivsel/sarskilte-behov/spesialundervisning/Spesialundervisning/ (Read 01/06 2016).

Norwegian Directorate for Education and Training. (2013a). *Rundskriv Udir-04-2013 Elever som tar fag fra videregående opplæring på ungdomstrinnet [Circular Udir-04-2013 Students who take subjects from upper secondary education in lower secondary school]*. Downloaded from: http://www.udir.no/Upload/Rundskriv/2013/Rundskriv_Udir-4-2013.pdf?epslanguage=no (Read 01/06 2016).

Norwegian Directorate for Education and Training. (2013b). *Regelverk i praksis. Prosjektrapport Delprosjekt 2 Roller og ansvar [Rules in practice. Project report Sub-project 2 Roles and responsibility]*. Downloaded from: http://udirbeta.udir.no/wp-content/uploads/2015/06/Regelverk-i-praksis-sluttrapport-DP2.pdf (Read 01/06 2016).

Norwegian Directorate for Education and Training. (2013c). *Veiledningsmateriell. Felles nasjonalt tilsyn 2014–2017 [Guidance material. Common national supervision 2014–2017]*. Downloaded from: http://www.udir.no/PageFiles/79327/TILSYNSVEILEDER%20BOKMAL.pdf?epslanguage=no (Read 01/06 2016).

Norwegian Directorate for Education and Training. (2009). *Rapport fra felles nasjonalt tilsyn 2009. (Kontroll av forsvarlig system for organisering av elevene i grupper) og forslag til områder for nasjonalt tilsyn [Report from common national supervision 2009. (Review of appropriate systems for organising students in groups) and proposal for areas for national supervision]*. Downloaded from: http://www.udir.no/Upload/Tilsyn/5/felles_nasjonalt_tilsyn-_2009_rapport.pdf (Read 01/06 2016).

NOU 2014: 7. *Elevenes læring i fremtidens skole. Et kunnskapsgrunnlag [Students' learning in the school of the future. A knowledge base]*. Oslo: *Ministry of Education and Research*.

NOU 2015: 2. *Å høre til – virkemidler for et trygt psykososialt skolemiljø [A sense of belonging – measures for a safe psycho-social environment]*. Oslo: *Ministry of Education and Research*.

NOU 2015: 8. *Fremtidens skole. Fornyelse av fag og kompetanser [The school of the future. Renewal of subjects and competences]*. Oslo: *Ministry of Education and Research*.

Nyström, P. (2016). Characteristics of high-performing students in mathematics. In Nordengen, M. and Thorsen, H. (ed.). *Northern Lights on PISA and TALIS Nordic Council of Ministers*. Copenhagen: Nordic Council of Ministers Secretariat.

OECD. (2013). *Education and social progress (ESP) Longitudinal study of skill dynamics.* Paris: OECD publishing.

OECD. (2013a). *Educational Research and Innovation. Innovative Learning Environments.* Paris: OECD Publishing.

OECD. (2013b). *PISA 2012 Results: What Students Know and Can Do: Student Performance in Mathematics, Reading and Science (Volume I)*. Paris: OECD Publishing.

Olsen, M. H. (2016). Relasjoner i pedagogikken [Relationships in pedagogy]. Olsen, M.H. (ed.). *Relasjoner i pedagogikken – i lys av Baumans teorier.* Oslo: Universitetsforlaget.

Olsen, M., Mathisen, A.R. and Sjøblom, E. (2016). *Faglig inkludert? Fortellinger fra elever med ulik måloppnåelse [Included in subjects? Narratives of students with varying goal satisfaction]*. Oslo: Cappelen Damm Akademisk.

Olsen, M.H. and Skogen, K. (2014). *Kontaktlæreren [The contact teacher]*. Oslo: Universitetsforlaget.

Olsen, R., Hopfenbeck, T. H., Lillejord, S and Roe, A (2013). *Elevenes læringssituasjon etter innføringen av ny reform. Synteserapport fra evalueringen av Kunnskapsløftet [The learning situation for students after the introduction of the new reform. Synthesis report from the evaluation of the Knowledge Promotion curriculum]:* http://www.udir.no/Upload/Rapporter/2013/Synteserapport%20RVO%20endelig%20jan%202013.pdf (Read 26/04 2016).

Ottestad, G., Throndsen, I., Hatlevik, O. and Roghati, A. (2014). *Digitale ferdigheter for alle? Norske resultater fra ICILS 2013 [Digital skills for all? Norwegian results from ICILS 2013]*. Oslo: University of Oslo.

Pintrich, P.R. and Schunk, D.H. (2002). *Motivation in education: Theory, research, and applications.* Englewood Cliffs, NJ: Merrill-Prentice Hall.

Renzulli, J. (2005). The Three-Ring Conception of Giftedness: A Developmental Model for Promoting Creative Productivity. In Sternberg, J. R. and Davidson, J. E. (ed.). *Conceptions of Giftedness.* Second Edition. Cambridge: USA.

Report to the Storting no. 16 (2006–2007) … *og ingen stod igjen – Tidlig innsats for livslang læring [… leaving nobody behind – early effort for lifelong learning]*. Oslo: *Ministry of Education and Research*.

Report to the Storting no. 19 (2015–2016). *Tid for lek og læring. Bedre innhold i Barnehagen [Time for playing and learning. Better content in day-care institutions]*. Oslo: *Ministry of Education and Research*.

Report to the Storting no. 20 (2012–2013). *På rett vei – Kvalitet og mangfold i fellesskolen [On the right path – Quality and diversity in comprehensive school]*. Oslo: *Ministry of Education and Research*.

Report to the Storting no. 22 (2010–2011). *Motivasjon – Mestring – Muligheter [Motivation – Mastering – Opportunities]*. Oslo: *Ministry of Education and Research*.

Report to the Storting no. 28 (2015–2016). *Fag – Fordypning – Forståelse. En fornyelse av Kunnskapsløftet [Subjects – In-depth studies – Understanding. A renewal of the Knowledge Promotion curriculum]*. Oslo: *Ministry of Education and Research*.

Robinson, V. (2014). *Elevsentrert skoleledelse [Student-centred school leadership]*. Oslo: Cappelen Damm Akademisk.

Rogaland County Governor. (2013). *Tiltak for dei evnerike barna i skolen [Measures for the gifted children in school]* Downloaded from: https://www.fylkesmannen.no/Rogaland/Arkiv--Nyheiter/Tiltak-for-dei-evnerike-barna-i-skolen/ (Read: 06/04 2016).

Sandvik, L. V. and T. Buland (ed.). (2013). *Vurdering i skolen. Operasjonaliseringer og praksiser. Delrapport 2 fra prosjektet Forskning på individuell vurdering i skolen (FIVIS) [Assessment in school. Operationalisations and practices. Sub-report 2 from the project Research on individual assessment in school (FIVIS)]*. Trondheim: Norwegian University of Science and Technology, Programme for Teacher Education and SINTEF.

Siegle, D. (2013). *The underachieving gifted child: Recognizing, understanding and reversing underachievement.* Waco, TX: Prufrock Press.

Skaalvik, E. and Federici, R.A. (2015). Prestasjonspresset i skolen [The achievement pressure in school]. *Bedre skole*, 3, 11–15.

Skogen, K. (2014). *Læreren som talentutvikler [The teacher as talent developer]*. Oslo: Universitetsforlaget.

Skogen, K. and Smedsrud, J. (2016). *Evnerike elever og tilpasset opplæring [Gifted children and differentiated instruction]*. Bergen: Fagbokforlaget.

SNAP. (2007). *Guidance for addressing needs of highly able students:* Downloaded from: http://www.educationscotland.gov.uk/resources/s/publication_tcm4623165.aspstrReferringChannel=educationscotland&strReferringPageID=tcm:4-615801-64&class=l1+d86716 (Read on 06/12 2015).

Sousa, D. A. (2009). *How the gifted brain learns.* California: Corwin.

Sternberg, J. R. and Davidson, J. E. (2005). *Conceptions of Giftedness.* Second Edition. Cambridge: USA.

Swedish National Agency for Education (Skolverket). (2015a). *Att arbeta med särskilt begåvade elever [Working with extraordinarily gifted students]*. Downloaded from: http://www.skolverket.se/skolutveckling/larande/sarskilt-begavade-elever-1.230661 (Read 06/12 2015).

Swedish National Agency for Education (Skolverket). (2015b). *Redovisning av uppdrag om att främja grund- och gymnasieskolors arbete med särskilt begåvade elever [Accounts from assignments to promote the work in primary school and upper secondary school with extraordinarily gifted students]*. Downloaded from: http://www.skolverket.se/om-skolverket/publikationer/visa-enskild-publikation?_xurl_=http%3A%2F%2Fwww5.skolverket.se%2Fwtpub%2Fws%2Fskolbok%2Fwpubext%2Ftryck-sak%2FBlob%2Fpdf3426.pdf%3Fk%3D3426 (Read 06/12 20.15).

Theilgaard, L. and Raaschou, N. (2013). *Københavnerbarometeret 2011 – resultater og analyse [The Copenhagen barometer 2011 – results and analysis]*. Copenhagen: Afdelingen for Pædagogisk Faglighed.

Tomlinson, C. A. (1999). *The differentiated classroom. Responding to the needs of all learners.* USA: Association for Supervision & Curriculum Development.

UNESCO. (1994). *The Salamanca Statement and framework for action on Special needs education. Adopted by the World conference on special needs education: Access and quality.* Downloaded from: http://www.unesco.org/education/pdf/SALAMA_E.PDF (Read 22/06 2016).

UNESCO. (1984). *Prospects – quarterly review of education. (Vol. XIV, No.2)*. Downloaded from: http://unesdoc.unesco.org/images/0006/000602/060274eo.pdf (Read 15/11 2016).

Wendelborg, C. and Caspersen, J. (2016). *Høyt presterende elevers vurdering av læringsmiljøet. Analyser av Elevundersøkelsen 2013 og 2014 [High achieving students' assessment of the learning environment. Analyses of the Student Survey 2013 and 2014]*. Downloaded from: *http://www.udir.no/globalassets/filer/tall-og-forskning/forskningsrapporter/hoyt-presterende-elever_rapport.pdf.* (Read 06/04 2016).

Wiliam, D. (2015). *Løpende formativ vurdering [Continuous formative assessment]*. Fredrikshavn: Dafalo.

Wiliam, D. (2014). *Optimizing Talent: Closing Educational Gaps Worldwide.* Downloaded from: http://www.dylanwiliamcenter.com/whitepapers/ (Read 06/12 2015).

Winner, E., Goldstein, T. R. and Vincent-Lancrin, S. (2013). *Art for Art's Sake? The Impact of Arts Education.* Paris: OECD Publishing.

Yang, M. (2005). Investigating the structure and the pattern in self-regulated learning by high school students. *Asia Pacific Education Review*, *6*(2), 162–169.

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Norwegian Ministry of Education and Reserch

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Internet: www.publikasjoner.dep.no
Telephone: + 47 222 40 000
Cover illustration: Anagram design
Graphics: Aktuba ink/Mats Sivertsen
Print: 07 Xpress 02/2017