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Country Background Report – Denmark

OECD Review of Policies to Improve the Effectiveness of Resource Use in Schools

This report was prepared by the Danish Institute for Local and Regional Government Research (KORA) for the Danish Ministry of Education, as an input to the OECD Review of Policies to Improve the Effectiveness of Resource Use in Schools (School Resources Review). The OECD and the European Commission (EC) have established a partnership for the Project, whereby participation costs of countries which are part of the European Union's Erasmus+ programme are partly covered. The participation of Denmark was organised with the support of the EC in the context of this partnership. The document was prepared in response to guidelines that the OECD provided to all countries. The opinions expressed are not those of the OECD or its Member countries. Further information about the OECD Review is available at www.oecd.org/edu/school/schoolresourcesreview.htm.

Det Nationale Institut
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Country Background Report – Denmark OECD Review of Policies to Improve the Effectiveness of Resource Use in Schools

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KORA
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Preface

This report presents the results of the Country Background Report (CBR) for Denmark prepared as input to OECD's Review of Policies to Improve the Effectiveness of Resource Use in Schools (referred to as School Resource Review).

The purpose of the OECD School Resource Review is to provide a comparative framework of knowledge based on experiences from the individual countries on

1. how to effectively govern resources in the school system
2. how to effectively distribute resources across the school system
3. how to effectively utilise resources, once they have been allocated to different priorities and programmes
4. how to effectively manage resources at different levels of the system (Directorate for Education and Skills 2013).

The overall purpose of the Danish CBR is to provide knowledge on the effectiveness of resource use in the Danish primary and lower secondary school system. This document was prepared in response to guidelines that the OECD provided to all countries. The document also constituted the background for an OECD expert team's visit to Denmark in April 2015.

In addition to the authors of the background report, a number of other researchers at KORA have contributed to the extensive work of data collection and the reviewing of studies:

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The Danish CBR is commissioned and financed by the Danish Ministry of Children, Education and Gender Equality.

Content

List of acronyms and glossary of terms

Acronym (if any)	English term	Danish term
Danish education system		
	Pre-primary education	Førskole
	Nursery	Vuggestue
	Day-care in private homes	Dagpleje
	Kindergarten	Børnehave
	Primary and lower secondary education (Basic education used as a shorthand form)	Grundskole
	Danish public school (The Folkeskole)	Folkeskole
	Private school	Privatskole
	Continuation school	Efterskole
	Special school	Specialskole
	Upper secondary and vocational education (Youth education used as a shorthand form)	Ungdomsuddannelse
EUD	Vocational education	Erhvervsuddannelser
	Upper Secondary education	Gymnasiale uddannelser
HF	Higher Preparatory Examination	Højere forberedelseseksamen
STX	Gymnasium (the general upper secondary education)	Studentereksamen
HHX	Higher Commercial Examination Programme	Højere handelseksamen
HTX	Higher Technical Examination Programme	Højere teknisk eksamen
	Tertiary education	Videregående uddannelse
KVU	Short-term tertiary education	Kort videregående uddannelse
MVU	Medium-term tertiary education	Mellemlang videregående uddannelse
	Professional bachelor's degree	Professionsbachelor
LVU	Long-term tertiary education	Lang videregående uddannelse
	Bachelor's degree	Bachelor
	Master's degree	Kandidat

Danish education system (adult education)

	Adult education	Voksenuddannelse
FVU	Preparatory adult education	Forberedende voksenuddannelse
AVU	Ordinary adult education	Almen voksenuddannelse
AMU	Adult vocational training programme	Arbejdsmarkedsuddannelse
GVU	Basic adult education programme	Grunduddannelse for voksne
VVU	Further adult education programme	Videregående voksenuddannelser

Institutions

DST	Statistics Denmark	Danmarks Statistik
LGDK/KL	Local Government Denmark	Kommunernes Landsforening
UVM	The Ministry of Education	Undervisningsministeriet
DLF	The Danish Union of Teachers	Danmarks Lærerforening
STIL	National Agency for IT and Learning	Styrelsen for It og Læring (former UNI·C)

Other

SU	The Danish students' Grants and Loans Scheme	Statens Uddannelsesstøtte
	Inclusion	Inklusion
	Comprehensive school	Enhedsskole
	Pre-school class	Børnehaveklasse
	The Folkeskole Act	Folkeskoleloven
	Common objectives	Fælles mål
	9^{th} form exams	(Eksamen efter 9. Klasse)
	10^{th} form exams	(Eksamen efter 10. Klasse)
	School-leaving examination	Folkeskolens afgangsprøve
	Quality report	Kvalitetsrapport
	Subjects in the humanities	Humanistiske fag
	Practical/Creative subjects	Praktiske/musiske fag
	Science Subjects	Naturfag
	Subject	Fag
	Bilingual children	Tosprogede
	Mother-tongue tuition	Modersmålsundervisning
	Elective subjects	Valgfag

Mandatory subjects	Obligatoriske fag
Compulsory education	Skolepligt
Differentiated teaching	Differentieret undervisning
Class teacher	Klasselærer
School-home cooperation	Skole-hjem samarbejde
National tests	Nationale tests
Student plan	Elevplan
School board	Skoleråd
Final school exam	Afgangsprøve
Grading scale	Karakterskala
School-based leisure time facility	SFO
School leader	Skoleleder
Special needs education	Specialundervisning
Mainstream class	Grundklasse
Special class	Specialklasse
Reception class	Modtagerklasse
Bridge building	Brobygning
Apprenticeship	Erhvervspraktik
Educational environment	Undervisningsmiljø
Bullying	Mobning

Executive summary

Education in Denmark consists of three levels – primary and lower secondary education, upper secondary and vocational education, and higher education. The focus of this report is the Danish 'Folkeskole' – the public part of primary and lower secondary education. It consists of a compulsory pre-school class (one year), forms 1 to 9 and an optional 10th form. In Denmark, education is compulsory for all children between 6 and 7 and 15 and 16 years of age. Whether education is received in a Folkeskole, a private school or at home is a matter of the parents' individual choice, as long as set standards are met. 82 per cent of Danish children in the compulsory form levels attend the Folkeskole.

Denmark is among the most fiscally decentralized countries in the OECD. The Folkeskole is one of the core tasks of the municipalities. Within the framework set by the Folkeskole Act and the regulations issued by the Ministry for Children, Education and Gender Equality, the municipalities are granted full financial and organizational responsibility for the Folkeskole. The municipalities are not allowed to finance schools by user fees but are committed to finance school expenditures by revenues from local taxes and general grants. The schools are responsible for ensuring that the quality of the education is in accordance with the national aims of the Folkeskole and the municipal requirements. The schools are also responsible for determining the planning and organisation of the education programme.

In 2014, a new school reform was initiated by a broad political majority in the Danish parliament. It is a major reform characterised by new ways of organising the school day, more time for academic development and room for new ways to learn. The reform is motivated by a need to improve both the educational performance and the wellbeing of Danish students. 1 billion DKK has been granted for competency development of teachers and schools leaders as part of the reform. The reform also envisages a more coherent system of performance management. Prior to the reform, a new legal framework for the utilisation of working hours of the teachers was decided upon.

According to the political agreement on the 2014 reform of the Folkeskole, the academic performance of Danish primary and lower secondary education ought to be ranked higher when compared to other OECD countries to which Denmark usually compares itself. A general challenge for the national level is to provide a governance framework that is capable of achieving a more effective use of school resources. In a fiscally decentralised system like the Danish, this includes establishing a governance framework that facilitates local decision making that matches resource utilisation to the local needs and contributes to the most suitable local solutions, in order to improve the educational performance of the students. One of the means of achieving this at present is through an extended and more qualified use of performance management.

In Denmark, the number of school-aged children is declining, and an increasing number of children attend private schools. As the municipalities own and run the public schools, it is also this entity that is challenged by the demographic change and faces a continuous need for adjusting resources and school facilities. At a more general level, an ongoing debate regards the question of striking the appropriate balance between national governance and local autonomy. In adjusting the governance framework, there is a continuous search for the right balance of authority and co-operation between the three layers of governance – the national, municipal and school levels – regarding the need for ensuring implementation of national goals and reforms, along with the need for simultaneously ensuring local autonomy and adaptation. The Danish system deliberately allows for diversity across municipalities.

There is a special focus on students with special needs. A political goal is to lower the impact of socio-economic background on performance. A relatively large proportion – based on the number of students attending special needs education – of the funds for the Folkeskole have until recently been allocated to special needs education. In 2012, a national aim on including 96 per cent of all students in the ordinary Folkeskole was agreed upon. In the wake of the accompanying changes in the economic incentives to include students with special needs education in ordinary education, a tendency towards further inclusion of students with special education needs has been seen as a formative part of school practices.

Four issues are addresses in this CBR: Governance of resources, Distribution of resources, Utilisation of resources and Resource Management. Methodologically, these issues are highlighted through a systematic review of articles and reports of governance, distribution, utilisation and management of resources in the Danish Folkeskole.

Governance of resources

Regarding governance of school resources, the level of expenditure of Danish lower and upper secondary education was above the average OECD level in the latest OECD calculation in 2011. However, from 2010 to 2013 both the total expenditures for the Folkeskole and the spending per student have been declining, indicating increased school resource efficiency. There has been an increased focus on effective use of resources on the agenda in the municipalities. The expenditures reached a maximun in 2009, but from 2009 to 2014 the municipal expenditures for the Folkeskole at large (also including municipal grants for private schools) were reduced by 3.5 billion DKK, equalling 6.3 per cent of the expenditures. Seen over the entire period from 2007 to 2014, the expenditures were reduced by 1.7 billion DKK, or 3.0 per cent of the expenditures. When looking across municipalities, significant variations in school expenditures per student are revealed. More than half of these inter-municipal variations in school expenditures can be explained by differences in socio-economic conditions.

In other words, the municipalities adjust the expenditures to local needs as expressed by socio-economic characteristics of the school-aged children.

Parallel to the importance of socio-economic conditions for the school expenditures, the socio-economic status of the individual students is highly important for performance of schools both with regard to students' marks at the final exams and the probability of continuing to upper secondary education. Studies of benchmarking indicate that a potential for improved efficiency and effectiveness of school resources may exist. However, due to their inherent nature the benchmarking studies provide no causal knowledge and, thus, no guidelines as to *how* the model-estimated potentials could eventually be realised. When controlled for socio-economic background, spending over all years of schooling is a more important determinant of student performance than spending in the final year of school attendance. In line with this, stable budgets are found to be beneficial for student performance, whereas the level of resources or growth in resources are less or not important.

Distribution of resources

The Danish municipalities are granted a high degree of autonomy in the allocation of resources for the Folkeskole. No comprehensive picture of the resulting diversity in organisation, budget models and principles for decisions on the school budget and the allocation of resources to individual schools, and for various purposes, exist. In addition, across municipalities the schools differ according to whether they are granted the autonomy to determine the distribution between wages and other expenditures as well as whether they are allowed to transfer a part of the budget from one budget year to another.

Almost all Danish municipalities use some form of demographic budgeting when determining the size of the school budget. Especially when determining the budgets for normal education, whereas demography-dependent budgets are used for special needs education to a lesser extent. The impression is that student-based budget models are increasingly gaining ground – at the expense of lesson-based models – when it comes to decision making for the entire school budget, as well as the allocation of resources to individual schools. In the wake of incentives embedded in a new legislative definition of special education in 2012, more students with special needs are included in normal classes. The municipalities decentralise the financial responsibility for special needs education to the individual schools to a larger degree and increasingly include socio-economic criteria in the distribution models.

In the Danish case, the share of immigrant students has a negative impact on student performance, when the share of immigrants exceeds a tipping point estimated to be around 50 per cent. Following a legal change in 2006, a number of municipalities have implemented transporting of students with immigrant background from school districts and schools with a large number of immigrants (or students from a disadvantaged so-

cio-economic background) to schools districts with more students of non-immigrant background, with the intention of improving equality in the educational performance of students. The first indicative evaluations suggest positive effects of this student re-distribution policy.

Both additional teaching in Danish and a newly developed education programme for common receptive language ability have been found to have a positive effect on the students' reading abilities. Despite the fact that efforts were aimed at bilingual students, particularly the monolingual students benefit from these. At a more aggregated level, national tests themselves are found to have positive effects on the students overall reading ability.

Structural changes in the number and size of schools have been a predominant characteristic since 2009, resulting in fewer and larger schools. These structural changes have presumably contributed to the decrease in expenditures for the Folkeskole since 2010. The same trend towards fewer and larger schools is found in both municipalities amalgamated in the Danish Structural Reform in 2007 and municipalities that were not amalgamated, see Chapter 1. The development in the number of students, competition from private schools and economic pressure seem to be more important drivers for changes in school structure compared to municipal amalgamations.

Resource utilisation

A key resource in the schooling sector is the teachers. Though traditional teachers are not the only personnel group used in public schools, the importance of the teachers is illustrated by the fact that many of the studies regarding resource utilisation concern the provision and effects of teacher resources. In general, teachers are found to be most valuable when they spend their time on teaching. A positive relationship exists between the time allocated to teaching and student achievement. In addition, the student-to-teacher ratio with respect to class size has an effect on student achievement, as more studies find a negative effect of class size on student achievement.

Teacher motivation is an important asset and is affected by the leadership style of the school leader as well as the way teachers perceive specific policy initiatives. When it comes to student achievement at the final exams in 9th form, students taught by teachers with a high level of Public Service Motivation perform better. There is a positive effect of extra teachers on the students' reading skills in national test scores in the 6th form.

Studies on the matching of resources to individual students' learning needs revealed large changes in special needs education in recent years. Inclusion of students with special educational needs has become much more prevalent and segregation to special education has decreased in the wake of changes in financial incentives and organizational changes in pedagogical-psychological advising unit (PPR). The increased use of

inclusion in public schools does not seem to have affected the parents' choice between public and private schools, but the evidence is somewhat weak.

The use of ITC in the Folkeskole is widespread, but not unproblematic. Teachers and school leaders have ITC available but experience operational and technical challenges. In addition, teachers report that they do not have sufficient competencies on how to use ICT and guide the students. A study of the effects of ITC in teaching finds that the availability of text-to-speech software has a positive effect on reading comprehension and text decoding in the national tests in reading.

Resource management

The development of and rise in data use in education over the last decade has allegedly moved the sector towards a situation with increasing 'governance by numbers'. This trend is being reinforced by the Folkeskole reform currently being implemented, as the reform places a stronger focus on national performance measures and gives school leaders more financial and managerial autonomy.

There has been an increase in the initiation and use of performance data in Danish education. Largely evaluation, documentation and performance data is available and initiated at national, local and school level. Comparatively, the Danish resource management systems can be termed soft. The Folkeskole is the responsibility of the municipalities, and the national level governs at a distance. School leaders are responsible for translating external demands into internal direction at the schools. Often, school leaders are more reactive than proactive in this regard. They often apply more informal leadership strategies based on relations and dialogue, rather than utilising evaluation, documentation and other forms of data. School leaders have typically viewed the purpose of the Folkeskole as being broader than performance relating to the academic skills of the students, but are increasingly emphasising performance-based management and use of evaluation data as relevant management instruments.

Municipalities are reluctant when it comes to follow-up on school performance, goal attainment etc. Thus, despite increased information from evaluations, documentation and performance data the information is not fully utilised as a management instrument. However, at this level there are also signs of a more professional approach to performance management, e.g. with the new version of the quality reports.

The increased focus on performance is accompanied by a strategy of transparency. So far, it is unknown whether increased demands on transparency will improve the performance of the Danish Folkeskole. However, increased transparency and the publication of performance data have led to an increased public debate about the quality and aim of the Danish Folkeskole.

The motives guiding municipalities, schools and teachers are important for effective implementation and resource management. Economic incentives seem rather strong at the level of the municipalities and to some extent at the school level. If resource management is supported by economic incentives, increased compliance can be expected at the municipality and school levels. Studies show that Danish teachers are motivated by a need to make a difference for the students and the society in general, i.e. public sector motivation and attaining better student performance. Teachers' responses to resource management vary depending on their values, their influence on the initiatives and their educational background.

1 Purpose, methods and contextual background

1.1 The purpose of the report and the core concepts

The overall purpose of the Danish Country Background Report (CBR) is to provide knowledge on the effectiveness of resource use in the Danish primary and lower secondary school system. The CBR has been prepared to provide information on approaches in the Danish school system to improve or sustain the effectiveness of resource use in schools, the challenges of implementation and the evidence of their impact for further analysis in the OECD School Resource Review.

The CBRs will provide analysis of context, key factors and policy responses under the theme of the effectiveness of resource use in the Danish school system.

The focus of the report is the Danish municipal primary and lower secondary school, called the "Folkeskole" (The Ministry of Education 2008). An annex describes governance, resource distribution, resource utilisation and resource management in preschool/daycare services and upper secondary and vocational education.

In line with the notion of "the 3 Es" of Fiscal management (Boyne 2002, Flynn 2012), three concepts relating to effective use of resources will be applied in the report:

1. Economy: Economic use of resources is related to the *input* of resources to the school system, the size of the budgets and the ability to stick to the budget. A typical indicator of Economy is school expenditure per student. Lower costs per student indicates a more economic use of resources.
2. Efficiency: Efficiency is related to the *output* of the school system relative to the *input* of resources to the school system, i.e. the cost per unit of output[1]. A typical indicator of Efficiency is the cost of one hour of teaching or the hours taught per year per teacher. More hours taught per teacher or lower costs per hour of teaching indicate a more efficient use of resources.
3. Effectiveness: Effectiveness is related to the *outcome* of the school system relative to the *input* of resources to the school system. This definition complies with the cost-effectiveness definition of effectiveness, i.e. the cost per unit of outcome. The quality and effects of the activities in the school system in relation to the targets to be achieved by the school system constitute the outcome of the school system. A typical indicator of Effectiveness is student performance

[1] The literature also uses the concept 'allocative efficiency' to refer to the responsiveness of the services to the preferences of the public (Boyne 2002: 18). In this report, however, we follow the convention and define efficiency as technical efficiency.

at final exams relative to the school expenditures per student. In this respect, higher student performance per DKK spent indicates higher effectiveness[2].

It should be noted, that studies of *effects* are not necessarily studies of *effectiveness*. Many well-performed studies of school effects are designed to benchmark effects across schools or estimate the effects of new policy initiatives. If no data on costs are included in the studies, only conclusions on effects can be drawn and no conclusions on effectiveness can be made. The OECD's School Resource Review focuses on the Effectiveness of Resource Use. Accordingly, effect studies without information on resource use do not provide relevant information. Thus, knowledge on resource use is crucial. Within the frame of the 3 E's, the Country Background Report focuses on the governance, distribution, utilisation and management of resources in the Danish Folkeskole.

Thus, the specific purpose of this report is to analyse the five themes listed in Table 1.1 and the accompanying research questions in the context of the Danish Folkeskole.

Table 1.1 Research themes and research questions

Theme	Research Question
1. Description of the Danish school system, emphasising primary and lower secondary education in the 'Folkeskole'	How is the Danish school system organised, and which contextual factors can be presumed to affect the economic governance of the Danish school system?
2. Governance of resource use	How is the use of resources governed, planned and implemented?
3. Resource distribution	How are resources distributed across levels, sectors and groups of students?
4. Resource utilisation	How are resources utilised in relation to various programmes and priorities?
5. Resource management	How are resources managed? How is the use of resources evaluated, and how do managers follow-up on resource use?

The review not only covers financial resources but a wider range of four types of resources:

[2] The cost-effectiveness definition of effectiveness complies with Boyne's concept of Cost per unit of outcome. Boyne understands effectiveness as the achievement of the formal objectives of services, independently of the costs (Boyne 2002: 18). It should be noted that in a complex multi-objective context, such as the Danish School System, effects may not only be hard to measure, but effect studies are also unlikely to be able to measure effects in relation to *all* the objectives of the national school system, nor to, say, balance effects in relation to different goals and different target groups against each other on a value-free basis (Boyne 2002; Flynn 2012). Accordingly, no study of effectiveness will be able to calculate the *total* effectiveness of the school system, but will potentially provide valid knowledge on effectiveness in relation to some of the core goals.

Resource type	
Financial:	e.g. public financing of the individual school and financial transactions between different levels of the school's administration.
Human:	e.g. teachers, school leaders and administrative personnel.
Physical:	e.g. buildings and equipment.
Targeted programs:	e.g. support programmes for special student groups, programmes with specific political goals, and programmes aimed at improving school management.

1.2 Data and methods

Methodologically, the description of the Danish school system (Theme 1) is based on a purposeful selection of relevant legal documents, evaluations and statistics that have been further analysed. Methodologically, the analyses of Themes 2 to 5 are based on a systematic review of scientific articles, books, national evaluations, consultancy reports etc. studying governance of resources, resource distribution, resource utilisation and resource management in the Danish context.

Informed by the indicators of The OECD's Guidelines for Country Background Report (Directorate for Education and Skills 2013), a number of subthemes have been synthesized to guide the review. These review-guiding subthemes are presented below for each of the four review-based themes in Table 1.1.

Governance of resource use:

- Policy priorities/differences in spending per student across regions or type of municipality
- Implementation of policies
- Responsibilities across levels of the school system
- Sources of revenue
- Benchmarking of efficiency or effectiveness/best practices.

Resource distribution:

- Distribution of resources across administrative levels and resource types
- Distribution of resources and students to individual schools
- School structure and distribution of school facilities and materials, e.g. ICT
- Distribution of teacher resources
- Distribution of school leadership resources
- Programmes targeted to specific students, e.g. resource distribution based on socio-economic criteria.

Resource utilisation:

- Allocation of teacher resources to students
- Matching resources to individual students' learning needs
- Organisation of teaching and learning environment
- Organisation of student learning time
- Use of school facilities and materials, e.g. ICT.

Resource management:

- Monitoring resource use (audit system etc.)
- Outcome-based planning, rewards, sanctions and other incentives
- Capacity building for resource management
- Transparency and reporting on outputs and costs.

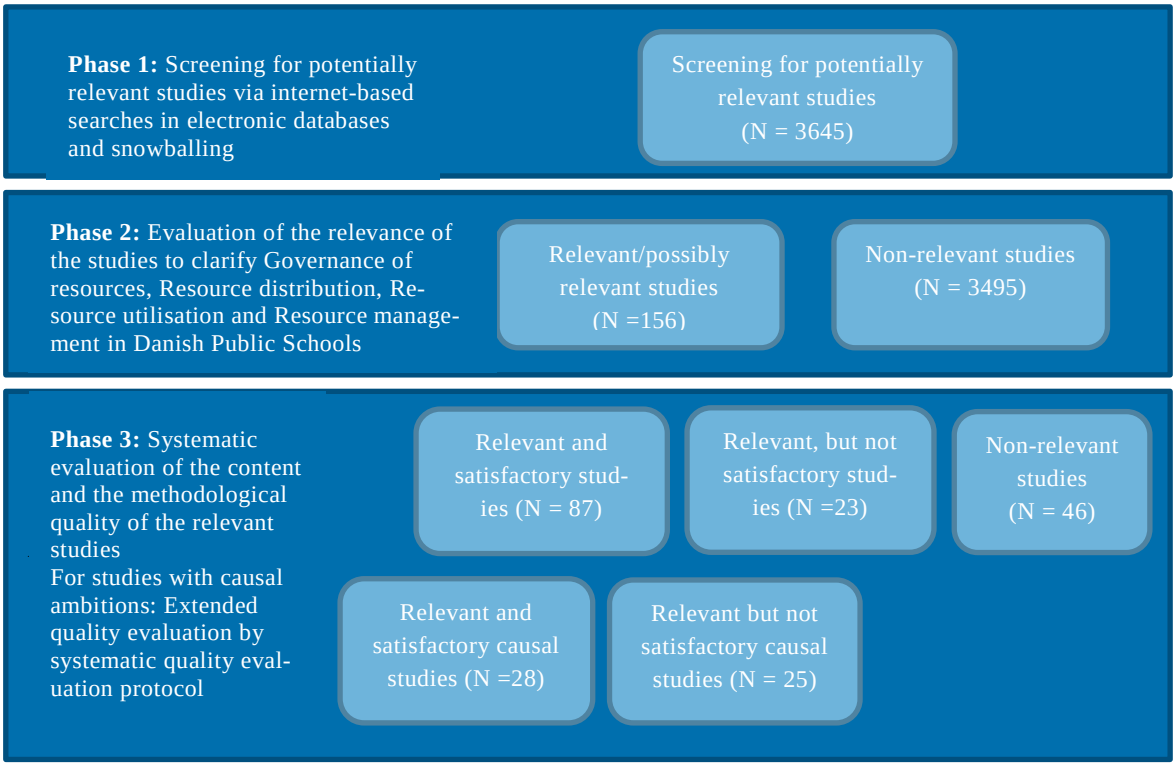
Search strategy

The systematic review of studies of Governance of resources, Resource distribution, Resource utilisation and Resource management was carried out in three phases:

1. Screening for potentially relevant studies via internet-based searches in electronic databases and the application of a snowballing method
2. Evaluation of the relevance of the studies in relation to the research questions
3. Systematic evaluation of the content and the methodological quality of the relevant studies.

These phases are illustrated in Figure 1.1. The contents of each phase are described in further detail in Appendix 4.

Figure 1.1 Overview of search strategy and number of studies in the systematic review



In addition to the evaluation of the relevance of the studies, each relevant study's methodological quality regarding reliability, validity and generalizability have been evaluated. Studies evaluated as Not satisfactory or Slightly satisfactory are not included in the review. In addition, studies that either explicitly or implicitly have ambitions of causal interpretation have been subjected to an extended evaluation of the study's causal methodological qualities in relation to design, analysis and support of conclusion. A total of 28 studies are evaluated as having a satisfactory causal quality. The evaluation process is described in further detail in Appendix 4.

The 87 relevant and satisfactory studies each cover one or more subthemes addressed in this report. The number of studies for each theme and subtheme is shown in Table 1.2.

Table 1.2 Number of studies covering each theme and subtheme

Theme	Number of studies
Governance of resources	**31**
GO1_Policy priorities/differences in spending per student across regions or type of municipality	13
GO2_Implementation of policies	11
GO3_Responsibilities across levels of the school system	2
GO4_Sources of revenue	1
GO5_Benchmarking of efficiency or effectiveness/best practices	15
Resource distribution	**46**
RD1_Distribution of resources across administrative levels and resource types	8
RD2_Distribution of resources and students to individual schools	11
RD3_School structure and distribution of school facilities and materials, e.g. ICT	8
RD4_Distribution of teacher resources	5
RD5_Distribution of school leadership resources	8
RD6_Targeted programs for specific students, e.g. resource distribution based on socio-economic criteria	14
Resource utilisation	**32**
RU1_Allocation of teacher resources to students	18
RU2_Matching resources to individual students' learning needs	10
RU3_Organisation of teaching and learning environment	2
RU4_Organisation of student learning time	2
RU5_Use of school facilities and materials, e.g. ICT	3
Resource management	**24**
RM1_Monitoring resource use (audit system etc.)	9
RM2_Outcome-based planning, rewards, sanctions and other incentives	12
RM3_Capacity building for resource management	7
RM4_Transparency and reporting on outputs and costs	8
Total number of studies	**87**

These themes and studies constitute the structure and knowledge base of Chapters 3-6 in this report on governance, distribution, utilisation and management of resources.

Seminar with relevant stakeholders

On March 23rd 2015 a seminar was held with relevant stakeholders in order to discuss the CBR. The participating stakeholders were The Teachers' Union, The School Leader's Union, Local Government Denmark (LGDK), The association of directors of education (Børne- og Kulturchefforeningen – BKF), The Ministry of Finance, the parental organisation School and Parents and The Association of Danish Pupils. The Ministry of Education hosted the seminar. KORA presented the findings of the CBR. The stakeholders had received the CBR beforehand and commented on it in the seminar. KORA has since incorporated these comments into the CBR.

1.3 Contextual background of the review

Denmark is among the most fiscally decentralized countries in the OECD (Thiessen 2003), with the municipal sector accounting for almost half of the consumption expenditures of the Danish public sector (Blom-Hansen, Houlberg & Serritzlew 2014). According to the Danish Constitution, "the right of municipalities to manage their own affairs independently, under State supervision, are set by statute" (The Ministry of Economic Affairs and the Interior 2014b). The Constitution also prescribes that some of the public tasks should be allocated to the local governments and that the Danish Parliament, the Folketing, decides how much should be allocated. It is also prescribed that the municipalities are subject to state supervision. Within the framework of the national legislation (The Folkeskole Act) that provides a common aim for all schools, standard requirements concerning the subjects and standard regulations concerning common objectives for the teaching in each subject, the Folkeskole is the responsibility of the municipalities. A more detailed description of the school system is provided in Chapter 2. However, in order to facilitate a better understanding of the contextual background of the current Danish school system, a brief overview of some of the most important contextual factors is given below.

- The Structural reform in 2007, involving amalgamations at the municipal and regional level, along with shifts in task between the tiers
- The financial crisis in 2008 and national budgetary sanctions from 2011
- Structural changes in the number and size of schools from 2009/10
- A reform of the Folkeskole in 2014.

The Structural reform in 2007

The Structural Reform implemented on January 1st 2007 amalgamated 271 municipalities into 98 municipalities. As a result, the average size of the municipalities and the economic capacities increased (Blom-Hansen, Houlberg & Serritzlew 2014). More specifically, 239 former municipalities were amalgamated into 66 new municipalities. 32 municipalities remained unchanged. The average size of the municipalities increased from 20,000 to 55,000 inhabitants. A core aim of the amalgamation reform was to improve economic and professional sustainability of the municipalities and to provide a structural basis for a more effective use of public sector resources. Larger municipalities were expected by the decision makers to increase the political capacity for decision making in order to change, for instance, the school structure towards fewer, larger and more economically advantageous schools.

A recent study shows that the municipal amalgamations created economies of scale for administrative costs, seen in a reduction of administrative costs by 10 per cent in the amalgamated municipalities relative to the non-amalgamated municipalities (Blom-

Hansen, Houlberg & Serritzlew 2014). Another element of the Structural Reform was a reshuffling of tasks between the municipal, regional and national tiers of government, involving, for instance, a transfer of responsibilities in a number of service areas from the regional to the municipal level.

The general distribution of tasks between the national level, municipalities and regions after the 2007 reform is outlined below (The Ministry of Economic Affairs and the Interior 2014b).

Tasks of the municipalities

- Social services: Financing, supply and authority
- Child care
- The Danish Folkeskole, including special education and special pedagogical assistance for small children
- Eldercare
- Healthcare: Prevention, care, rehabilitation outside hospitals, special dental care and dental care at schools, home care and social psychiatry
- Libraries, music schools, local sports facilities and other cultural sites
- Integration and language lessons for immigrants
- Support services: Unemployment insurance, early retirement benefits, cash benefits and sickness benefits
- The active employment effort for both insured and non-insured unemployed people
- The local road network
- Participation in regional transport companies
- Nature, environment and planning
- The utility sector (partly privatised) and emergency services
- Local business service and promotion of tourism
- Citizen service regarding taxes and collection in cooperation with the state tax centres.

Tasks of the regions

- Hospital service, psychiatry and the National Health Service, including general practitioners and specialists
- In addition:
    - Regional development, including secretarial services for regional growth forums
    - Soil pollution and raw materials
    - Operation of a number of institutions for vulnerable groups and groups with special needs who require social services and special education

State tasks

- Police, defence and the legal system
- The foreign service and official development assistance
- Overall planning in the healthcare sector
- Education and research, except primary schools, lower secondary schools and special education
- The Danish Working Environment Service and the employment policy
- Tax collection etc. and recovery of debts to the public sector
- Reimbursements of local government expenditure for unemployment insurance
- Early retirement benefits and cash benefits
- The road network and the Danish state railways
- Nature, environment and planning tasks
- Certain cultural measures
- Business economy subsidies
- Reception of asylum applicants.

Generally, the tasks are allocated to the municipalities and the regions by statute. Basically, municipalities and regions cannot carry out any trade or industry. There are also narrow limits when it comes to granting financial support to individuals and enterprises (The Ministry of Economic Affairs and the Interior 2014b).

As part of the 2007 reform, the responsibility for upper secondary education (Gymnasiums) was transferred from the regional to the national level. As vocational education was already a state task, the responsibility for all upper secondary and vocational education activities after 2007 lies with the national level. Upper secondary and vocational schools generally have the status of self-governing institutions.

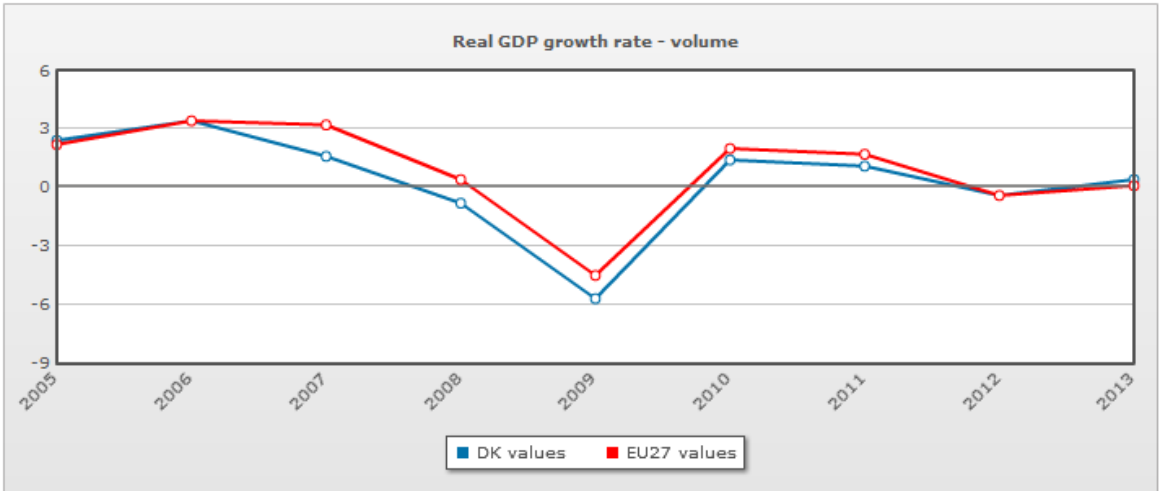
Regarding primary and lower secondary education, the municipalities after the 2007 reform have the full financial and professional responsibility for both normal and special needs education. The economic rationale underlying this part of the reform was to enable a more economically balanced and effective use of school resources by having one political body making simultaneous decisions on allocation of resources to both normal and special needs education.

Political authority in the municipalities lies with the municipal board, consisting of 9 to 31 councillors. The councillors are elected for a fixed four-year term on the basis of a proportional voting system. The head of the council is the mayor elected by and among the local councillors.

The financial crisis in 2008 and national budgetary sanctions from 2011
A financial crisis hit Denmark and most other countries in the Western world in 2008. It was followed by increased unemployment and pressure on public finances, due to

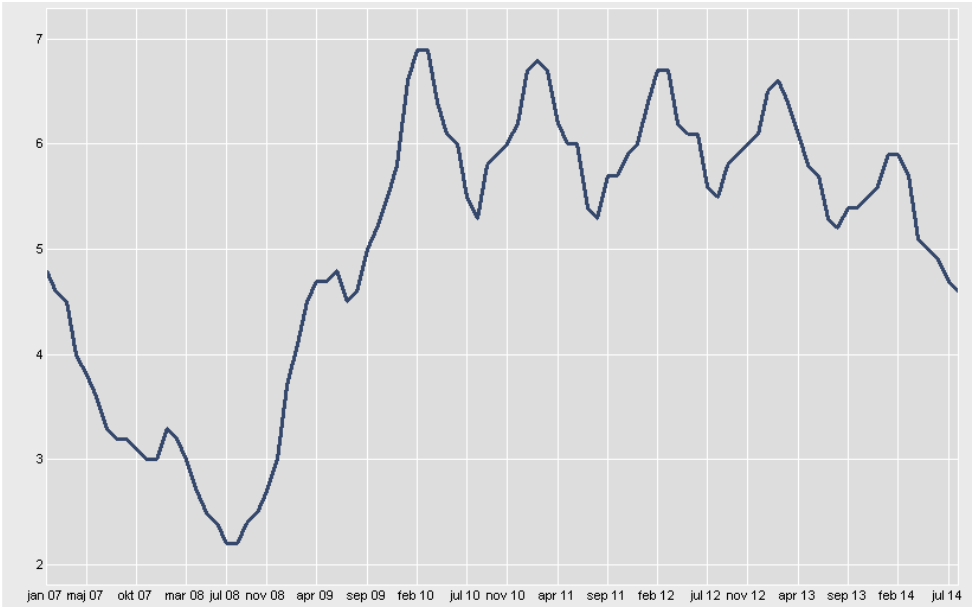
increasing expenditures for social and employment activities combined with reduced growth in tax income etc. As illustrated in Figure 1.2, Figure 1.3 and Figure 1.4, in Denmark GDP growth dropped significantly from 2008 to 2009, unemployment increased and the structural budget balance of the public sector shifted from positive to negative.

Figure 1.2 GDP growth 2005-2013



Source: The European Commission. Europe 2020 in your country. http://ec.europa.eu/europe2020/europe-2020-in-your-country/danmark/national-reform-programme/index_en.htm

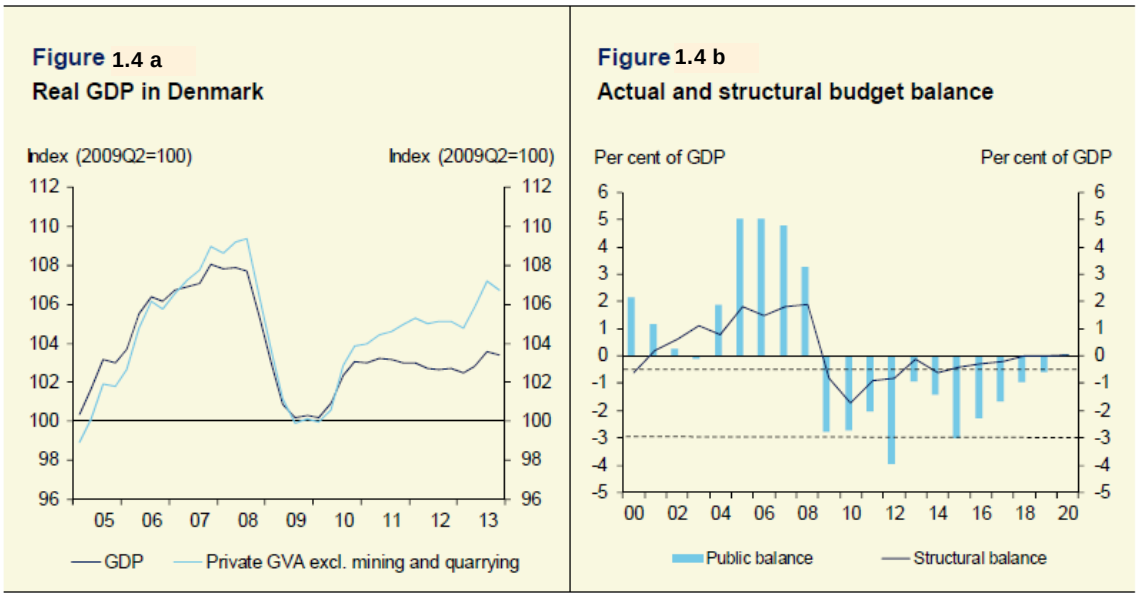
Figure 1.3 Unemployment rate 2007-2014



Note: Number of unemployed (full time equivalents) as a percentage of the workforce.

Source: Statistics Denmark, www.statistikbanken.dk, AUP02.

Figure 1.4 GDP growth and structural budget balance



Note: Figure 1.4a shows a two-quarter moving average. The horizontal dotted lines in Figure 1.4b show the budget law limit of 0.5 per cent of GDP for the structural deficit and the stability and growth pact limit for the actual deficit of 3 per cent of GDP.

Source: The Danish Government (2014). Convergence Programme Denmark, http://ec.europa.eu/europe2020/pdf/csr2014/cp2014_denmark_en.pdf

As a result of a built-in-lag in the municipal financial system based on a choice of state-guaranteed tax bases, the economy in many municipalities was not affected significantly by the financial crises until the end of 2009. Despite the financial crisis, the municipalities ended up spending almost 5 billion DKK more than budgeted in 2009. In light of the financial crisis, the EU stability pact and the budget overruns in the municipalities, the Danish government initiated an enforced sanction regime on the municipalities in 2010. An act[3] stipulated that 3 billion DKK of the general grants to the municipalities should be conditional on the municipalities not exceeding the level of expenditures agreed upon in the yearly agreements between the national Government and Local Government Denmark (LGDK). This sanction regime was implemented in 2011.

With the so-called Budget Law, this sanction regime was made permanent in 2012[4]. The Act was approved in 2012 by a broad majority in the Danish Parliament, and it sets the overall framework for fiscal policy in Denmark. The Budget Law introduced binding multi-annual expenditure ceilings for central government, municipalities and regions, respectively. The ceilings are agreed upon by the Danish Parliament, set upper limits on actual spending and include a broad range of public expenditures. The Budget Law does not change the autonomy of each municipality or region with regard to

[3] Act 710 of 25/06/2010
[4] Act 547 of 18/06/2012

their right to determine the level of service, but it stipulates the overall economic framework for both municipalities and regions.

If the municipalities collectively do not keep their expenditures in final accounts below the expenditure ceiling, as determined annually by the national Parliament, economic sanctions of up to 3 billion DKK will be imposed on the municipalities. 60 per cent of a sanction will be imposed upon the individual municipalities that contribute to exceeding the expenditure ceiling, whereas the remaining 40 per cent of the economic sanctions for exceeding the expenditure level will be imposed upon the municipalities collectively.

Since 2011, the municipalities have kept their total service expenditures below the expenditure ceiling in both the budgets and in the final accounts (Christiansen 2014). In each of the years 2011-2013, the municipalities *under*ran their budgets by 4-6 billion DKK. Since 2010, the economic agenda of the municipalities has been an agenda of expenditure reduction and an intensified quest for more effective use of resources. From the budget overruns in 2009 to the budget underruns in 2012, the total municipal service expenditures were reduced by 12 billion DKK (The Ministry of Finance, Ministry of Economic Affairs and the Interior & Local Government Denmark 2013), equalling approximately 5 per cent of the total service expenditures. Based on the recently published accounting figures for 2014, the reduction in municipal service expenditures from 2009 to 2014 equals 11.3 billion DKK or 4.6 per cent[5]. In the school area, both the unit costs per student and the total expenditures for the Folkeskole have been decreasing since 2009 (see Table 1, Appendix 1). From 2009 to 2014, the municipal expenditures for the Folkeskole at large were reduced by 3.5 billion DKK, equalling approximately 6.3 per cent of the expenditures. Seen over the entire period from 2007 to 2014, the expenditures were reduced by 1.7 billion DKK, or 3.0 per cent of the expenditures[6].

Structural changes in the number and size of schools from 2009/10
Structural changes in the number and size of schools have been a predominant characteristic of the 'Folkeskole' in recent years and have presumably contributed to the decrease in expenditures for the Folkeskole mentioned above. These structural developments have taken place at the same time as the majority of municipalities have experienced a declining number of school-aged children. From 2007 to 2013, a total of 270 out of 1580 municipal schools were closed, i.e. almost every fifth school has been closed since the Structural reform in 2007.

The most recent population forecast predicts that the number of school-aged children will drop by 8 per cent over the next ten years (see Figure 1.3). Thus, structural chang-

[5] Local Government Denmark: www.kl.dk/Okonomi-og-dokumentation/Styr-pa-okonomien-id178699/?n=0&section=132442
[6] Expenditures not adjusted for changes in tasks.

es are likely to be on the school policy agenda in the years to come also. At the same time the number of 65+ year old citizens is predicted to grow by 20 per cent, reflecting a growth in the number of 75-84 year old and 85+ year old citizens.

In order to improve public finances and increase labour supply, a number of macro-structural reforms and initiatives have been enacted by the national parliament in recent years. These include reforms of the disability pensions, the flexjob scheme, the Cash Benefit system, the Sickness benefit system along with for instance a tax reform, a pension package, a growth plan, a growth package and a comprehensive youth unemployment package. For a brief description of these reforms and initiatives see http://ec.europa.eu/europe2020/pdf/csr2015/nrp2015_denmark_annex1_en.pdf

However, in the years to come the demographic changes and an aging population will require continuous political focus on financing and allocation of resources in the Danish public sector.

Table 1.3 Age distribution 2014 and population forecast for age groups 2014-2024

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Age distribution 2014
0-5 year	370524	361811	355675	349618	349216	351888	359383	368703	379779	391474	402771	6.6
6-16 year	736393	734749	732091	730109	722758	716033	708037	700049	692155	684942	677995	13.1
17-64 year	3493584	3502066	3507434	3513640	3518875	3520511	3521888	3522435	3522064	3522064	3522472	62.1
65-74 year	611679	625372	637007	645316	648882	650437	646228	640278	633120	627760	626848	10.9
75-84 year	299190	307768	318209	329409	345548	364045	385724	409315	433382	453672	468654	5.3
85+ year	115865	116814	117837	118997	120479	122290	124901	128043	132113	137019	142552	2.1
Subtotal: 65+ year	1026734	1049954	1073053	1093722	1114909	1136772	1156853	1177636	1198615	1218451	1238054	18.2
Total population	5627235	5648580	5668253	5687089	5705758	5725204	5746161	5768823	5792613	5816931	5841292	100.0
Development indexed (2014= 100)												
0-5 year	100.,0	97.6	96.0	94.4	94.2	95.0	97.0	99.5	102.5	105.7	108.7	
6-16 year	100.0	99.8	99.4	99.1	98.1	97.2	96.1	95.1	94.0	93.0	92.1	
17-64 year	100.0	100.2	100.4	100.6	100.7	100.8	100.8	100.8	100.8	100.8	100.8	
65-74 year	100.0	102.2	104.1	105.5	106.1	106.3	105.6	104.7	103.5	102.6	102.5	
75-84 year	100.0	102.9	106.4	110.1	115.5	121.7	128.9	136.8	144.9	151.6	156.6	
85+ year	100.0	100.8	101.7	102.7	104.0	105.5	107.8	110.5	114.0	118.3	123.0	
Subtotal: 65+ year	100.0	102.3	104.5	106.5	108.6	110.7	112.7	114.7	116.7	118.7	120.6	
Total population	100.0	100.4	100.7	101.1	101.4	101.7	102.1	102.5	102.9	103.4	103.8	

Source: Statistics Denmark, FRDK114.

The reform of the Folkeskole in 2014

Turning to school policies, a major reform of the Folkeskole is being implemented from the summer of 2014 and onwards, along with changes in the framework for utilisation of working hours of the teachers. The school reform is described in detail in Chapter 1. When interpreting the findings in this CBR report, it is important to bear in mind that the Danish Folkeskole, at the very time of this review, is undergoing a sig-

nificant transformation. Some of the descriptions and findings of previous studies may no longer be fully in line with the current state of the Folkeskole. As the reform is *being* implemented at the time of the review, it is not possible to examine the effects of the reform – neither with regard to student performance and the wellbeing of students or the overall effectiveness of resource use in the Folkeskole.

2 The Danish school system

In Denmark, there is a long tradition of basic education[7] being locally sustained. At the same time, there is a corresponding tradition of national regulation and standardisation of compulsory basic education, despite it being run by the municipalities. Basic education is organised in a complex, multi-layered and interrelated governing system that transcends the traditional divide between a centralized and decentralized systems for providing public goods. It consists of layers of old, revised and new initiatives targeting the municipal school system and the individual school.

The focus of this CBR report is the 'Folkeskole'. The 'Folkeskole' is the Danish municipal primary and lower secondary school. Before the Folkeskole is described in detail, an overview of the Danish education and school programme will be provided.

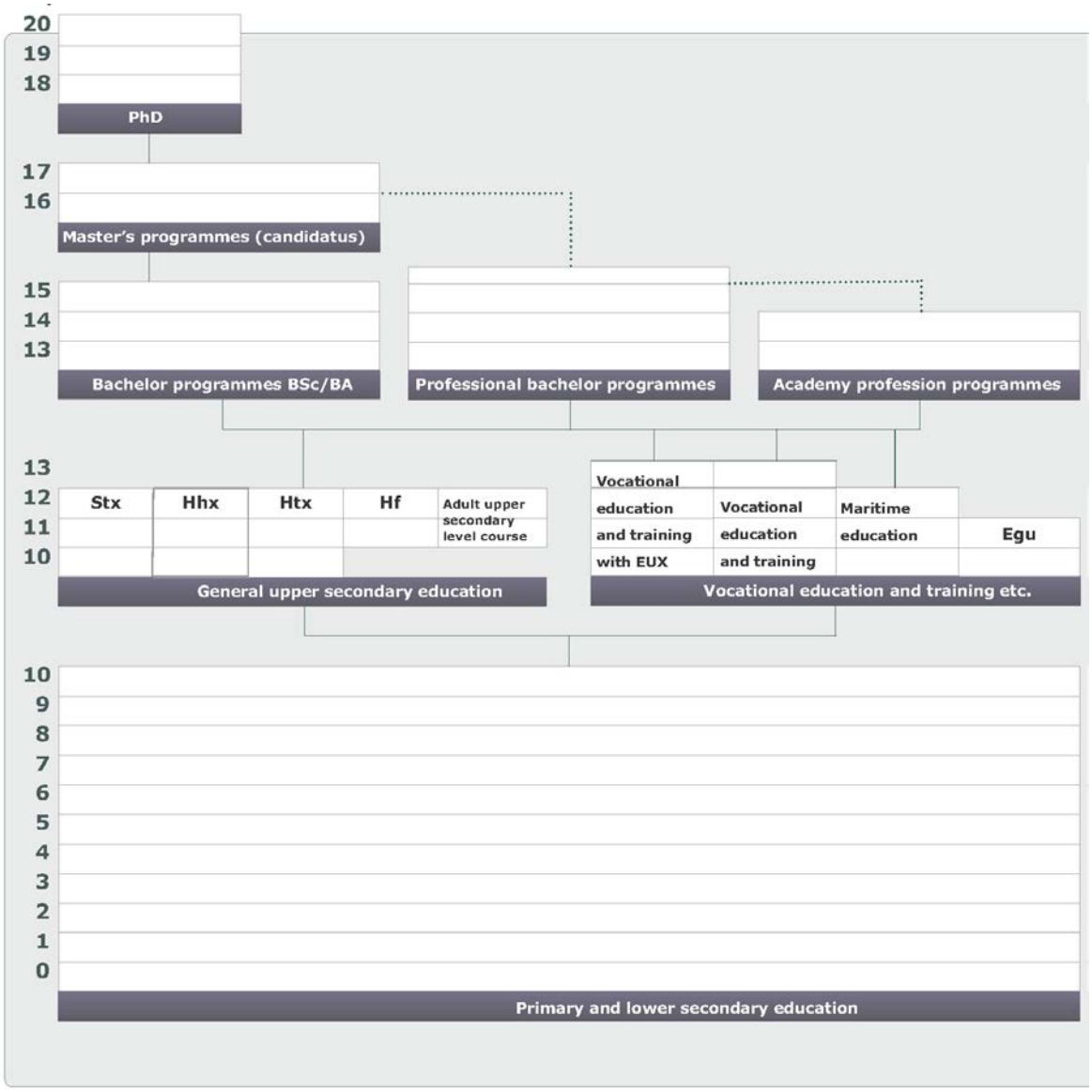
The following subthemes guide and structure the chapter:

- Organisation of the school system and the structure of the overall education programme
- Key figures of the Folkeskole and recent reforms
- Objectives of the education system and student learning objectives
- Education environment and the distribution of responsibilities in the school system
- Market mechanisms in the school system
- Performance of the school system
- Policy approaches to equity in education
- Main challenges.

2.1 Organisation of the school system and the structure of the overall education programme

The Danish education programme consist of three overall levels: 1) primary and lower secondary education; 2) Upper secondary and vocational education; and 3) higher education. The structure of the Danish education programme – from primary and lower secondary education to PhD education – is shown in the figure below.

[7] Basic education is used a shorthand abbreviation of primary and lower secondary education



Primary and lower secondary school

Danish public primary and lower secondary schools are run by the municipalities (The Folkeskole). It consists of a compulsory pre-school class (one year), forms 1 to 9 and an optional 10th form. Thus, in Denmark, basic education consists of a ten-year compulsory education programme for all children between 6-7 and 15-16 years of age. The compulsory education begins in August of the calendar year in which the child turns six. All children begin their schooling with a one-year pre-school class (form 0), which is an integral part of the school initiation process. Books and other teaching materials in primary and lower secondary schools are free of cost for the students.

Denmark differs from a range of other countries with a practice of compulsory school attendance in that it is education attendance and not school attendance that is compulsory. Whether education is received in a publicly provided school, a private school or at home is up to the parents, as long as accepted national standards are met. Based on

figures from 2012, 82 per cent of Danish children attend the Folkeskole in forms 0 to 9 (The Ministry of Education 2015a). The remaining children attend private alternatives or are taught at home. However, only very few children are taught at home.

The private lower and upper secondary schools and the continuation schools are alternatives to the Folkeskole. Private lower and upper secondary schools offer teaching to children in the age bracket of compulsory basic education. Continuation schools are private boarding schools that typically offer teaching from the 8th to the 10th form. The private schools and continuation schools must fullfil the same requirements as those that apply to their municipal counters. However, the framework for planning the teaching is more open in both types of private schools. Both types are self-governing institutions financed by state subsidies and student contributions.

In 2013/2014, a total of 709,900 students attended primary or lower secondary education. Of these, 558,600 attended a Folkeskole. The number of students in private lower and upper secondary schools was 108,100. 24,400 students attended a continuation school. The remaining students attended various kinds of schools for children with special needs[8]. Basic education completed with 9th form gives admission to upper secondary education. However, students may choose to continue in the non-mandatory 10th form.

According to the international ISCED11-classification, pre-school class corresponds to the Danish level 0, and primary and lower secondary school correspond to level 1 (1st through 6th form) and level 2 (7th through 10th form).

Youth education (upper secondary and vocational education)
Youth education (ISCED 3), the equivalent of upper secondary and vocational education, builds upon the qualifications that students have acquired in their basic education. All young people must be offered a youth education. Youth education is divided into *general upper secondary education*, which provides access to higher education, and *vocational upper secondary education*, which primarily provides access to employment but also to further education.

By 2012, 71.5 per cent of 21-year-olds and 86 per cent of 25-26-year-olds had completed an upper secondary or vocational education. According to a 2011 government platform, 95 per cent of each cohort of young people are to complete a youth education programme by 2015. Based on a profile model on educational behavior, the Ministry of Education estimates that 93 per cent of the year group completing the 9th form in 2015 will complete an upper secondary or vocational education.

[8] http://statweb.uni-c.dk/databanken/uvmDataWeb/ShowReport.aspx?report=EGS-bestand-skoletype-herkomst

General upper secondary education consists of:

- Gymnasium (STX),
- Higher preparatory examination (HF),
- Higher commercial examination (HHX)
- Higher technical examination (HTX).

The common objective of the education programmes is to prepare young people for higher education. The four general upper secondary programmes have different curricula. STX and HF share broad-based curricula across faculties. HHX focuses on social science subjects, mainly business and economics, and languages. HTX focuses on natural sciences and technology. The duration of STX, HHX and HTX is three years. These programmes admit young people who have completed 10 years of basic schooling. The duration of HF is two years. Admission requires 11 years of basic schooling. In 2013, a total of 149,000 students attended general upper secondary programmes[9].

The vocational upper secondary education (EUD) consists of EGU, VET, EUX and a number of maritime education programmes. The EGU programme is a short basic vocational training programme, in which practical training is combined with a school-based part. The duration of EGU is usually two years but may vary from one and a half to three years. EGU is designed for students who prefer 'on the job training'. Hence, the school-based part is rather short compared to other youth education programmes. The duration of the school-based part is between 20 and 40 weeks. The aim of EGU is to get students into employment or continued education. In 2013, about 2000 students attended this programme[10].

The VET programme consists of a basic and a main programme. In order to enter the main programme students must have a training agreement with a company. There are 111 vocational education and training programmes, each of which leads to a number of vocational specializations, such as carpenter, gardener, sales assistant or chef. In 2013, a total of 126,300 students attended the VET programme[11].

The EUX programme, introduced in 2010, is a combination of VET and upper secondary education. When students graduate they attain a vocational specialisation as well as a general upper secondary education. The duration of the EUX programme is four years.

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9 http://statweb.uni-c.dk/Databanken/uvmdataweb/fullClient/Default.aspx?report=EAK-tilgang-udd&res=1680x844

10 http://statweb.uni-c.dk/Databanken/uvmdataweb/fullClient/Default.aspx?report=EAK-tilgang-udd&res=1680x844

11 http://statweb.uni-c.dk/Databanken/uvmdataweb/fullClient/Default.aspx?report=EAK-tilgang-udd&res=1680x844

Higher education

The higher education programmes in Denmark constitute the educational continuation of youth education and provide the students with final vocational qualifications. They are categorized according to level and duration:

- The short-cycle higher education (ISCED5), primarily the vocational academy education
- The medium-cycle higher education (ISCED6), primarily the university bachelor programmes and the professional bachelor programmes
- The long-cycle higher education, i.e. master's programmes (ISCED7) and the PhD programmes (ISCED8).

A vocational academy education is a short-cycle higher education usually scheduled to two years. These education programmes are often directed towards a specific trade or job function, and they combine theory and practice. In 2013, 13,000 students attended such programs[12]. Short-cycle higher education grants admission to relevant bachelor programmes.

A professional bachelor education is a medium-cycle higher education with a duration of three to four years including a minimum of six months' practice. A professional bachelor education combines theory and practice and is directed towards a certain trade or job field. In 2013, 28,000 students attended this programme[13]. There is also a three-year academic bachelor education programme. In 2013, 27,000 students attended this program[14]. Both professional and academic bachelor education is a complete education giving vocational qualifications as well as access to relevant master's programmes.

All long-cycle higher education university programmes consist of a three-year bachelor programme followed by a two-year master's programme (ISCED 7). The education may be extended further by a three-year PhD programme (the so-called 3+2+3 year model). In 2013, 24,000 students attended a master's programme, and 770 students attended a PhD programme.[15]

Higher education is free of charge in Denmark, and students are also entitled to subsidies, student grants and student loans scheme (SU) to cover living and housing expenses during their studies. Students usually pay for books and other teaching materials. The latest calculations based on the educational behaviour in 2013 estimate that 93 per cent of a youth cohort will complete an upper secondary or vocational education,

12 http://statweb.uni-c.dk/databanken/uvmDataWeb/ShowReport.aspx?report=EAK-tilgang-vidudd
13 http://statweb.uni-c.dk/databanken/uvmDataWeb/ShowReport.aspx?report=EAK-tilgang-vidudd
14 http://statweb.uni-c.dk/databanken/uvmDataWeb/ShowReport.aspx?report=EAK-tilgang-vidudd
15 http://statweb.uni-c.dk/databanken/uvmDataWeb/ShowReport.aspx?report=EAK-tilgang-vidudd

62 per cent will complete a higher education and that 29 per cent will complete a long-cycle higher education[16].

2.2 Key figures of the Folkeskole and recent reforms

Since the early 1990s, the Danish school system has been characterized by managerial and financial decentralisation from the national level to the municipalities and schools. In the last couple of years, a number of reforms have been introduced in an endeavour to improve the Danish school system.

The Danish Folkeskole was founded in 1814. Until the end of the 20th century, only five major changes were made to the Folkeskole Act (1903, 1937, 1958, 1975, and 1993). Since the beginning of the 21st century, a number of comprehensive changes have been made to the Folkeskole Act. Most recently, the new comprehensive reform of the Folkeskole that is being implemented in the school year 2014/15.

Some key figures of the Folkeskole are presented below.

Key figures of the Danish Folkeskole

- 98 municipalities
- 1,312 municipal schools (2013)
- 557,206 students in pre-school to the 9th form (2013)[17]
- 61,622 students with immigrant background (2012)
- The average number of students per class is 21.4 (2013)
- From 2014, the minimum number of annual lessons set in the Act of the Folkeskole is 1200 hours for pre-school to the 3rd form, 1320 hours for forms 4-6 and 1400 hours for forms 7-9.
- The student/teacher ratio is 10.45 on average across municipalities (2013)
- 49,390 teachers (2014)[18]
- 4.8 per cent of the students receive special needs education (2013)
- The average municipal cost per student is approximately 61.190 DKK per year (2013), including municipal and regional special schools.

Source: (The Ministry of Education 2015b); http://statweb.uni-c.dk/databanken/uvmDataWeb/MainCategories.aspx?, www.krl.dk and Appendix 1 of this report.

16 http://uvm.dk/Service/Statistik/Tvaergaaende-statistik/Andel-af-en-aargang-der-forventes-at-faa-en-uddannelse/Kommunerne
17 Figures include students in special schools.
18 Full-year equivalents. Including pedagogical leaders of the compulsory pre-school classes (form 0).

The Folkeskole, including public special needs schools, covers the vast majority of the teaching of the students at primary and lower secondary level. The Folkeskole is free of charge and is regulated by the Folkeskole Act, which describes the common aims of the Folkeskole. Furthermore, the Act describes the leadership and organisation of the Folkeskole. One important specification is that municipalities are responsible for providing public education, meaning that the 98 Danish municipal councils themselves determine the contents of their respective school policies within the scope of the Folkeskole Act.

The number of school-aged children has been declining for several years. According to the demographic forecasts, this development is likely to continue in the years to come. Outside the capital area of Copenhagen, only a few municipalities have experienced a growth in the number of school-aged children over the last years. At the national level, the number of school-aged children has dropped by almost 3 per cent from 2008 to 2014. Across the municipalities, the average decline has been 4.5 per cent. The largest decline has been close to 30 per cent. These demographic changes continuously challenge the municipalities to adjust resource allocation and school capacities to the declining number of students.

Table 2.1 The number of school-aged children 2008-2014

	2008	2009	2010	2011	2012	2013	2014
Number of children 6-16 year old	757,717	756,791	752,733	749,390	743,376	738,868	736,393
Development indexed (2008=100)	100.0	99.9	99.3	98.9	98.1	97.5	97.2
Average of the municipalities	100.0	99.6	99.0	98.2	97.1	96.1	95.5
Min.	100.0	92.4	87.7	81.6	78.6	73.8	71.7
Max.	100.0	106.8	110.8	113.2	113.0	115.1	117.7

Note: January 1st figures.

Source: Statistics Denmark, www.statistikbanken.dk, FOLK1.

In parallel with the declining number of school-aged children, the number of students in primary and lower secondary schools have been declining from 2008 to 2013 (see Table 2.2). This development is particularly felt in the Folkeskole, whereas the number of students in private schools in the same period was increasing. The share of students attending private schools, including continuation schools, increased from 16.9 per cent in 2008 to 19.1 per cent in 2013. Thus, the Folkeskole faces increased competition from private schools. The setting and role of the private schools is further described in Section 2.5.

Table 2.2 Distribution of students in primary and lower secondary schools across type of school

	2008	2009	2010	2011	2012	2013
The Folkeskole (including municipal youth schools)	584,090	581,211	577,626	566,298	569,090	563,001
Private independent schools	94,936	95,431	98,882	103,477	106,090	108,098
Continuation schools (independent boarding schools for lower secondary students)	26,433	27,155	26,971	27,246	26,536	27,276
Special schools	10,128	10,408	10,165	9,622	9,303	9,060
Daily treatment centres	3,401	3,127	3,051	2,628	2,567	2,461
All primary and lower secondary schools	**718,988**	**717,332**	**716,695**	**709,271**	**713,586**	**709,896**

Note: Primo September figures. Figures for the Folkeskole include students in municipal youthschools as municipal youth schools are often the organising unit for the voluntary 10th form. Figures for independent continuation schools include continuation schools with special offers. Daily treatment centres are special schools associated to 24-hour care centres for children and young people with social and behavioural problems. Figures for September 2014 not yet available.

Source: Databank of the Ministry of Education, http://statweb.uni-c.dk/databanken/uvmDataWeb/MainCategories.aspx?, EGS.

Focusing on the Folkeskole, the total number of students dropped by 4 per cent from 2008 to 2013. This development is a combined consequence of the demographic changes mentioned above and an increasing number of students selecting private schools.

Table 2.3 The number of students in the Folkeskole 2008-2013

	2008	2009	2010	2011	2012	2013
Number of students in pre-school to 9th form	580,339	576,519	573,355	560,082	562,649	557,206
Number of students in 10th form	17,280	18,227	17,487	18,466	18,311	17,316
Number of students in pre-school to 10th form	597,619	594,746	590,842	578,548	580,960	574,522
Indexed development (2008=100):						
Number of students in pre-school to 9th form	100.0	99.3	98.8	96.5	97.0	96.0
Number of students in 10th form	100.0	105,5	101,2	106,9	106,0	100,2
Number of students in pre-school to 10th form	100.0	99.5	98.9	9.8	97.2	96.1

Note: Early September figures. Figures include students in special schools, daily treatment centres and municipal schools. Municipal schools are often the organising unit for the voluntary 10th form. Figures for September 2014 not yet available.

Source: Databank of the Ministry of Education, http://statweb.uni-c.dk/databanken/uvmDataWeb/MainCategories.aspx?, EGS.

Students are divided into classes with an average across the municipalities of 21.5 students per class (2013). Classes are basically formed based on the age of the students and not the students' proficiency. Usually, the students stay in the same class for all 10 years of compulsory basic education. As illustrated in Table 2.4, the age distribution of the students is fairly even, as approximately one tenth of the students attend each of the compulsory form levels from pre-school to the 9th form.

Table 2.4 The number of students at each form level of the Folkeskole 2013

Form	Number of students	Share of students (% of 0-9th form)	Share of students (% of 0-10th form)
0 (pre-school)	56,373	10.1	9.8
1	57,831	10.4	10.1
2	56,740	10.2	9.9
3	57,625	10.3	10.0
4	57,063	10.2	9.9
5	55,098	9.9	9.6
6	56,245	10.1	9.8
7	56,222	10.1	9.8
8	54,771	9.8	9.5
9	49,238	8.8	8.6
Forms 0-9	**557,206**	**100.0**	**97.0**
10	17,316		3.0
Forms 0-10	574,522		100.0

Note: Early September figures for pre-school (form 0) to 10th form. Figures include students in special schools and municipal schools. Municipal schools are often the organising unit for the voluntary 10th form. Figures for September 2014 not yet available for all municipalities.

Source: Databank of the Ministry of Education, http://statweb.uni-c.dk/databanken/uvmDataWeb/MainCategories.aspx?, EGS.

Towards the end of the 9th form, all students in lower secondary schools have to make a choice of upper secondary or vocational education on the digital platform www.optagelse.dk. As mentioned above, the voluntary 10th form is an optional educational offer for young people who after finishing basic education are in need of additional academic qualifications and/or clarification regarding their further educational opportunities before enrolling in upper secondary or vocational education programs. In 2001, 60.4 per cent of the students chose 10th form. Until 2007, the share of students attendending 10th form in the Folkeskole was decreasing while the share of students attending gymnasium was increasing (Danmarks Evalueringsinstitut 2011:29). In 2014, the share was 48.3 per cent[19].

[19] Databank of the Ministry of Education. http://statweb.uni-c.dk/Databanken/uvmDataWeb/ShowReport.aspx?report=FTU-antal-uddannelse-fra9

Table 2.5 9th form students' choice of upper secondary and vocational education

	2008	2009	2010	2011	2012	2013	2014
10th form	32,525	30,346	31,358	33,320	32,040	31,936	31,236
Vocational education	8,566	7,796	6,985	6,120	5,367	4,742	4,899
Upper secondary education	22,935	23,504	25,288	25,800	25,703	26,779	26,200
Special education for young people	226	149	160	243	215	181	214
Unknown		24					
Other than upper secondary and vocational education	3,075	1,912	2,069	2,365	2,392	2,431	2,181
All 9th form students making educational choices	**67,327**	**63,731**	**65,860**	**67,848**	**65,717**	**66,069**	**64,730**
Distribution across type of education (per cent):							
10th form	48.3	47.6	47.6	49.1	48.8	48.3	48.3
Vocational education	12.7	12.2	10.6	9.0	8.2	7.2	7.6
Upper secondary education	34.1	36.9	38.4	38.0	39.1	40.5	40.5
Special education for young people	0.3	0.2	0.2	0.4	0.3	0.3	0.3
Unknown	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other than upper secondary and vocational education	4.6	3.0	3.1	3.5	3.6	3.7	3.4
All 9th form students making educational choices	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Note: 9th form students' educational choices in the common enrolment for of upper secondary and vocational education at www.optagelse.dk towards the end of 9th form. Note that the choices made by the students in 9th form are not fully reflected in the actual educational activities in the following school year. This may be due to students not being accepted by the prefered educational institution or students changing their preferences after the choice made at the end of 9th form.

Source: Databank of the Ministry of Education, http://statweb.uni-c.dk/Databanken/uvmDataWeb/ShowReport.aspx?report=FTU-antal-uddannelse-fra9

Table 2.6 shows the students attending the 10th form and the distribution of these students across different types of schools. Of the students attending the 10th form around, 43 per cent choose the Folkeskole as their base for the voluntary 10th form. A similar share chooses one of the independent continuation schools. However, the latest available data (2013) indicates that the continuation schools are attracting an increasing share of 10th form students, while the share of the Folkeskole is slightly decreasing.

Table 2.6 Distribution of students in the 10th form across type of school

	2008	2009	2010	2011	2012	2013
The Folkeskole (including municipal youth schools)	15,694	16,664	16,313	17,066	16,793	15,926
Private independent schools	3,188	3,080	3,600	3,687	3,407	3,583
Continuation schools (independent boarding schools for lower secondary students)	15,336	15,981	16,324	16,526	16,191	17,076
Special schools	1,200	1,163	811	852	869	893
Daily treatment centres	386	400	363	548	649	497
All primary and lower secondary schools	**35,804**	**37,288**	**37,411**	**38,679**	**37,909**	**37,975**
Distribution across type of scool (per cent):						
The Folkeskole (including municipal youth schools)	43.8	44.7	43.6	44.1	44.3	41.9
Private independent schools	8.9	8.3	9.6	9.5	9.0	9.4
Continuation schools	42.8	42.9	43.6	42.7	42.7	45.0
Special schools	3.4	3.1	2.2	2.2	2.3	2.4
Daily treatment centres	1.1	1.1	1.0	1.4	1.7	1.3
All primary and lower secondary schools	100.0	100.0	100.0	100.0	100.0	100.0

Note: Early September figures. Figures for the Folkeskole include students in municipal youth schools as municipal youth schools are often the organising unit for the voluntary 10th form. Figures for independent continuation schools include continuation schools with special offers. Daily treatment centres are special schools associated with 24-hour care centres for children and young people with social and behavioural problems. Figures for September 2014 not yet available.

Source: Databank of the Ministry of Education, http://statweb.uni-c.dk/databanken/uvmDataWeb/MainCategories.aspx?, EGS.

On average, the students choosing to take the 10th form in a continuation school have higher 9th form exam marks and come from a more well-educated social background than the students choosing the 10th form in the Folkeskole (Danmarks Evalueringsinstitut 2011). The students choosing continuation schools also seem to be more confident regarding their educational choice and judge their own professional competences to be at a higher level compared to their fellow students choosing the 10th form in the Folkeskole (Danmarks Evalueringsinstitut 2011). The students choosing continuation schools are more heterogeneus, but are less motivated on average by professional upgrading in their choice of school compared to the students choosing 10th form in a Folkeskole. Upgrading of professional competences is an important motivational factor for choosing 10th form in a continuation school, but overall seems to be less important compared to reasons such as moving to a new school, building new social relations and friendships and being able to prioritize sports and creative subjects (Danmarks Evalueringsinstitut 2011, Danmarks Evalueringsinstitut 2012).

Changes in the school structure

Several municipalities have subjected their school system to structural reforms and as a result closed down smaller schools or merged schools practicing joint management across two or more cadastres. From 2007 to 2013, a total of 17 per cent of the municipal schools were closed down (net)[20], and the average size of a Folkeskole across the

[20] Including organizationally merged schools practicing joint management across two or more cadastres.

municipalities increased from 362 students to 442 students. In line with this trend towards fewer and larger schools, the average class size increased from 20.1 to 21.4 students per class from 2009 to 2013. For more detail on these structural developments, see Chapter 5.

The 2014 reform of the Folkeskole

In 2014, a new school reform was initiated by a broad political majority in the Danish parliament. The reform represents a major change of the Danish Folkeskole, since it marks new ways of organising students' school days, more time for academic development and more room for new ways to learn. For instance, students are taught more hours each day, and the school day includes regular physical exercise. The school reform is motivated by a need to improve both the educational performance and wellbeing of Danish students. It has the following three main goals:

- The public school must challenge all students to reach their full potential. All students must be challenged according to their academic level.
- The public school must lower the significance of social background for academic results.
- Trust in the school and student well-being must be enhanced through respect for professional knowledge and practice in the public school.

Moreover, there is a stronger focus on national performance measures, e.g. indicators regarding academic performance, as well as the wellbeing of students. Furthermore, more financial and managerial autonomy is granted to school leaders. In line with earlier reforms, the idea is that more autonomy is delegated to the school leaders in return for a nationally consistent and congruent performance system. This system is expected to increase the incentives of the school leaders to improve school performance in accordance with national goals.

Measurable results and attainment targets are set up to support the fulfillment of the national objectives. The intention is to monitor the development continuously. The targets are:

- At least 80 per cent of the students must be *good* at reading and maths in the national tests. A baseline is set based on the results of students achieving the mark 3 or higher in the national tests in 2012.
- The number of high-performance students in Danish and maths must *increase* year by year. A baseline is set based on the percentage of students achieving the top score 5 in the national tests in 2012.
- The number of students performing *poorly* in the national tests on reading and maths must be reduced year by year. The indicator is particularly to focus on the percentage of students with parents with only compulsory or unknown education that perform poorly in the national test.

- The wellbeing of students must *increase*. A national obligatory and robust indicator for wellbeing has been developed by the Ministry of Education. The instrument is based on a survey conducted among the students on their wellbeing. The first survey was conducted in late March 2015.

The objectives for the students' academic development are estimated based on the students' results in standardized national tests, see below.

The results are aggregated on a national level at the municipal level, school level, form level and for the individual student. The aggregated measures serve as a starting point for the follow-up, which must take place at all levels – from teacher to national level – in relation to the development of the students' academic standards.

There will be a yearly review on the fulfillment of the targets. This review will serve as the basis for a discussion on the status of the Folkeskole reform between the government, the municipalities and stakeholders such as Local Government Denmark (LGDK) and the Teachers' Union. The main elements of the reform of the Folkeskole are:

- A longer and more varied school day with more and improved teaching and learning. The structure of the school day is deregulated. At the same time, the requirements on the total number of teaching time in especially Danish and maths are extended substantially, including:
    - Increased number of Danish and Maths lessons
    - Introduction of English in the 1st form and a second foreign language in the 5th form
    - New subjects in Crafts and design and Nutrition knowledge
    - Increased number of physical exercise and sport lessons
    - Subject-divided lessons and additional time for assisted learning
    - Homework assistance.
- An enhanced professional and competency development of teachers, pedagogical staff and school principals
- Few and clear objectives and simplification of rules and regulations. The Common Objectives of curricula are clarified and simplified. The purpose of this is to ensure learning objectives focusing on learning outcome and supporting goal-oriented teaching to a larger degree compared to the former curricula versions.
- Increased focus on preparing students for further education.
- Better learning environments.
- Stronger parental influence and increased student participation.

- A shift in the management of the sector away from input management – i.e. management of teacher behaviour – and process regulation towards management based on an enhanced focus on academic results.

As part of the political agreement of the reform of the Folkeskole in 2014, 1 billion DKK was granted nationally for competence development of teachers in the years 2014-2020. No systematic knowledge on the implementation and effects of this is yet available.

Parallel to the 2014 reform of the Folkeskole, a reform of vocational training has been initiated, and a reform of the upper secondary school was under preparation.[21] The intention is to develop a coherent school system for children from the age of 0 to 18. General trends in these reforms are a focus on academic skills, the well-being of students, the quality of teaching and simplification of rules/cutting of red tape. A recurring theme in the reforms is that they are intended to support the achievement of the political aim that 95 per cent of each annual cohort of young people are to complete an upper secondary or vocational education.

Work Agreement

Ahead of the reform of the Folkeskole, an Act specifying the framework for utilisation of working hours of the teachers was passed in April 2013 (Act no. 409). The Act was passed by the Parliament, due to the inability of the Teachers' Union and the municipalities to reach a collective agreement. Traditionally and in most instances, working conditions in Denmark are agreed upon between employers and employees without the interference of legal regulation, see also Chapter 5. During the final part of the negotiations, teachers were locked out for four weeks in the spring of 2013 by LGDK, who represented the municipalities as employers.

The Act replaces a previous agreement between the Teachers' Union and LGDK reached in 2008. According to the 2008 agreement, the teachers had more autonomy to independently organise how to utilise their working time compared to the former 2005 agreement. And there was more room for the teachers and the school leaders to change the scope and content of various teacher tasks. However, a common core element in the previous agreements was a centrally negotiated working time agreement giving all teachers a certain amount of preparation time for each lesson, independently of their level og experience or which subjects they were teaching. For example, an experienced teacher, teaching two weekly lessons of PE in two 2nd form classes and one 3rd form class, respectively, would have the same amount of preparation time as a newly qualified teacher, teaching two weekly lessons of 5th form Danish, 9th form maths and 3rd form biology. This left school leaders with little or no managerial flexibility to differ-

[21] However, this was withheld, as the political parties could not reach an agreement in the first round of negotiations.

entiate between young and experienced teachers, subjects to be taught, students' levels or innovative inter-teacher collaborations etc.

With the new Act, the former time management rules were dispensed, giving school leaders further management discretion and increased local decision-making autonomy regarding the utilisation of the teachers' working hours. This can be seen as a prerequisite for the reform of the Folkeskole with the purpose of achieving a longer school day and more flexible task planning.

The new regulation of the utilisation of working hours does not specify norms for the time to be spent on the various teacher tasks. The Act makes it possible, in accordance with the school's strategy and core tasks, to utilise the teachers working hours based on what best supports student learning and achievement. The flexibility within the Act makes room for a prioritisation of the teachers' tasks and teaching based on students' abilities and needs, for instance. School management can grant newly qualified teachers fewer teaching hours than they previously would have been able to. Conversely, school leaders can assign extra teaching hours to experienced teachers.

As part of the implementation of the Act, 60 per cent of the municipalities have introduced attendance requirements, meaning that the teachers have to be present at the school in a certain time period every day, regardless of their number of teaching hours. 22 per cent of all municipalities have introduced an upper limit for the number of teaching hours one teacher is supposed to perform (Astrup Bæk 2014).

2.3 Objectives of the education system and student learning objectives

In order to ensure the best possible conditions for high quality teaching, a number of national initiatives have been taken. These include efforts to replace management by rules and processes with management by few, clear targets and performance information of results, in order to support the municipalities' responsibility for the development of the quality in the public school. The Act and its executive orders describe the subjects that are to be taught and the common objectives of teaching in each subject (national curriculum).

The Aim of the Folkeskole

According to preamble in the Folkeskole Act, the Folkeskole is to have a broad scope. Broadly, the aim of the Folkeskole is, in cooperation with the parents, to provide students with knowledge and skills that will prepare them for further education, training and learning. The Folkeskole is to promote the all-round development of the individual student. It is also to provide the student with skills and understanding that will enable him or her to participate, be co-responsible and understand the rights and duties in a democratic society.

The Folkeskole is to strive towards working methods and create a framework that provides opportunities for in-depth study and allows for initiatives through which students are able to develop an awareness of their imagination and confidence in their own possibilities.

Common Objectives.
According to national statute, all schools are to share a common aim and apply standard requirements concerning the subjects offered at specific form levels. Moreover, they are to follow the nationally imposed study and attainment targets and the regulations concerning the leadership and organisation of the school system (The Ministry of Education 2008: 2). As a result, all municipal primary and lower secondary schools share a standard regulation – the so-called Common Objectives. The Common Objectives for the subjects taught specify the central knowledge and skills students are to acquire at different form levels in each subject. Common Objectives such as study and attainment targets were introduced in 2003. From 2007, they were supplemented with the introduction of national tests that follow up on the attainment of the targets, see also the next section. Overall, the targets specify the skill level and learning progression of the students. Attainment targets at the end of basic education are also defined at the national level, cf. the compulsory school leaving examinations after the 9th form. The study and attainment targets are compulsory, as standardised rules apply for all exams.

Furthermore, guidelines for curricula and descriptions of the educational progress required in order to reach the form level specified in the study targets are provided. However, no tight curriculum exists at the national level. The national curricula are instructive, as are the descriptions of how to reach the targets. In drawing up their curricula, schools are required to incorporate the study and attainment targets.

With the reform of 2014, the common objectives have been reduced, clarified and simplified, with the intention of ensuring that the learning objectives focus on the students' learning (outcome) rather than on the content of the lessons (input). The clarification will help school leaders, parents – including the parental representatives of the school board – and students to better understand the objectives, in order for them to become active partners in relation to improving their own academic achievement. Furthermore, it is to assist teachers and the school in shifting to a more goal-oriented approach to teaching.

The objectives for academic development in the Danish school system are now to be estimated based on the students' results in the national tests. Thus, it is possible to follow students' progression in Danish in the 2nd, 4th, 6th and 8th form and in Maths in the 3rd and 6th form. The objectives will be estimated at the national level, municipal level, school level, form level and for the individual student. They are intended to be a key element in the follow-up to be addressed at all levels of the system of basic education.

Thus, with the reform larger emphasis is put on performance measures, including national performance measures of academic performance and well-being of Danish students. With regard to the well-being of Danish students, a survey tool has, as mentioned above, been developed by the Ministry of Education. The tool measures the well-being of students.

National testing

As a part of the process of evaluating the students' learning outcomes, a range of mandatory national tests have been introduced, as mentioned above. By assessing the progression and standard achievement of students in relation to the study and attainment targets, teaching can be planned according to the individual student's strengths, weaknesses and potentials to a greater extent. The first tests were introduced in 2007. At this time, it was not compulsory for schools to use the national test. As of 2010, it became compulsory for all schools to take part in the yearly national test.

Students must complete the following tests:

- Danish, with a focus on reading in the 2nd, 4th, 6th and 8th form
- English in the 7th form
- Mathematics in the 3rd and 6th form
- Geography in the 8th form
- Biology in 8th form
- Physics/Chemistry in the 8th form.

The tests are computer based and adaptive, meaning that they are continuously adapted to the individual student. If a student answers a question incorrectly, they are given an easier question; if the student answers correctly, they are given a more difficult question. In this way, it is assured that the tests provide an accurate picture of each student's academic level.

The test is one of a number of pedagogical tools available for teachers to assist the evaluation, development and planning of their teaching (The Ministry of Education 2008: 4). The results are also used for guiding the individual student and will additionally be beneficial for improving cooperation with parents. The parents are therefore informed in writing about the results of the tests.

Use of test results and publication of results

Information concerning test results for individual students, groups of students, teams, classes, schools, municipalities and regions etc. are confidential. To elaborate, the student, parent and teacher have access to information about the individual student's test results. The school leader has information about the school's test results, and the municipality has information about the average score of the schools in the municipality

and the average test results for each school. At the national level, the *national* average test result for all schools is published and made available to the public, see Table 2.7.

Table 2.7 Access to test results at different levels

	Available test results
National level	- National average of all schools together.
Municipality	- Average result of the schools together in the municipality (for each test). The municipality is not allowed to publish schools' test results. - The average result of each school in each test. - Data for each school adjusted for socio-economic factors.
School leader	- The school's average result in each test. - The average results for each class. - The students' test results. - School data adjusted for socio-economic factors.
Teacher	- Test results for each student and class.
Student and parent	- Test results for the individual student.

Source: The Ministry of Education.

The different stakeholders can compare themselves with the national average, but benchmarking towards other schools or municipalities is not possible. For instance, the municipality cannot benchmark themselves against other municipalities, the school leaders cannot compare themselves to other schools and the parents cannot compare different schools' average test results. Municipalities and schools are only allowed to share test results after having accounted for the specific need for sharing information and gained the necessary permission.

Consequently, the test results can be used in order to follow the individual student's acquisition of knowledge and skills.

The question of making the schools' test results public has been heavily debated during the last few years. Lately 'The Danish Productivity Commission' has in 2013 recommended to publish the test results so that they can be used for comparable reasons and in order to ensure greater transparency regarding the results (Produktivitetskommissionen 2013)

Furthermore, schools are obliged, according to the Act on Transparency and Openness passed in 2002 (Act no. 414 of 06/06/2002), to publish performance indicators such as average grades, transition frequencies to further education and results of evaluations conducted by the school, see also Chapter 3.3. The publication of such evaluative information on schools in Denmark has helped promote evaluation and create a focus on average grades as a relevant indicator of quality and an input to school-based quality improvement (Normann Andersen & Dahler-Larsen 2008).

Inclusion of students with special educational needs

Denmark has signed the Salamanca Declaration, which calls on governments to facilitate Inclusive Education. Nested within the overall intention to increase the educational attainment of the Folkeskole, a governmental aim is to include students with special needs in the common Folkeskole. In the spring of 2012, a legislative change was implemented in the Folkeskole Act defining special needs education more explicitly compared to previously, narrowing the definition to activities in special schools, special classes and normal classes when the student attends at least nine hours of special needs education per week. In continuation of this, LGDK and the national Government agreed on principles and outlined objectives for an increased inclusion of students with special educational needs in the Folkeskole, aiming at raising the proportion of students in normal education to 96 per cent in 2015, along with goals for student performance and maintaining the wellbeing of this group of students. As a result, Danish basic education is in the midst of a restructuring process regarding inclusion of students with special needs.

The legislative change in the Folkeskole Act and the agreement between LGDK and the national Government was accompanied by a change in the economic incentives for the municipalities to include students with special needs education in normal classes, as the financial responsibility for special needs education is decentralised to the individual schools to a larger extent today than previously. Prior to 2012, special needs education was typically financed by common pools at the municipal level, leaving the schools with an incentive to exclude students as the costs of excluded students would be paid by the common pool. The share of students segregated to special needs education in special classes and special schools has declined from 5.3 per cent of students in 2012 to 4.8 per cent of students in 2013 (see Table 2.8), thus approaching the aim of inclusion of 96 per cent of the students in 2015.

Table 2.8 Share of students in segregated special needs education, 2010-2012

	2010	2011	2012	2013
All students	5.8	5.4	5.3	4.8
Boys	8.0	7.5	7.2	
Girls	3.4	3.2	3.0	

Note: Only municipal schools are included. There is a data break between 2011 and 2012, as legislative change was implemented in the Folkeskole Act defining special needs education more explicitly compared to previously, narrowing the definition to activities in special schools, special classes and normal classes when the student attends at least nine hours of special needs education per week.

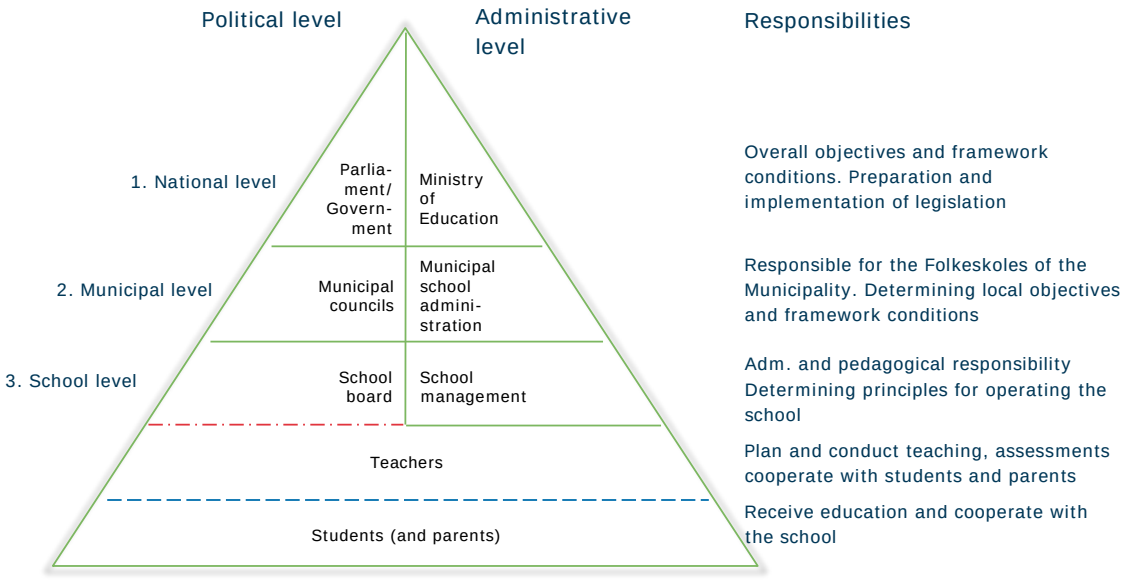
Source: (The Ministry of Education 2014d) and www.uddannelsesstatistik.dk.

The segregation percentage is still more than twice as high for boys compared to girls. The degree of segregation also relates to the socio-economic background of the students. 14 per cent of the students from homes with parents having only compulsory education at Folkeskole level are excluded compared to 2 per cent of the students from homes with parents with long-term tertiary education (The Ministry of Education 2014d).

2.4 Education environment and the distribution of responsibilities within the school system

The Danish Folkeskole is embedded in a governance system consisting of three levels or layers – the state, the municipalities and the schools. The interrelation between these three layers points to a complex system of governance, in which the national level governs at a distance through common objectives, standardisation of procedures and processes of evaluations and requirements as to documentation of the performance of each school (Normann Andersen 2007). This system of governance rests on a delicate balance, which also shifts over time, between local autonomy and central authority (Normann Andersen 2007, Simola et al. 2011). The national level creates spaces for local and school level autonomy (activity level of basic education and the curriculum) but within nationally specified frames and guidelines. The municipal board is responsible for providing every child in the municipality a free education in the Folkeskole. Each school is responsible for ensuring the quality of the education in accordance with the aims of the Folkeskole. Within the schools, students and parents are to work together with the school in order to live up to the aims of the Folkeskole.

The figure below illustrates the three layers – and two additional sub-layers at the school level, that of teachers and students (and their parents).



From the national level, there are no earmarked funds distributed to primary and lower secondary education, see Chapter 4. The national funds are distributed to the municipalities as part of the overall budget for the municipalities. It is up to the municipal council to distribute funds to primary and lower secondary education and ensure that national requirements are met.

The national level

The Danish Ministry of Education sets the overall purpose and frame with regard to the content of primary and lower secondary education and distributes the responsibility allocated to each of the three governing levels. As mentioned earlier, the Danish Folkeskole is regulated by the Folkeskole Act, which provides the overall framework for the schools' activities.

The Ministry of Education has the overall responsibility for managing the various domains of basic and youth education and for ensuring the foundation for carrying out the government's education policy. A reorganisation in 2013 led to the creation of an agency for IT and learning (EMU). EMU is the common portal for the educational sector in Denmark (http://www.emu.dk/). Via EMU, teachers, students, parents and others with an interest in schools and training have access to a vast amount of resources and information on basic education, teaching and evaluation. EMU gathers the most relevant educational material, services and resources available on the Internet. EMU is focused on content in the Danish language and on the needs of students and teachers in Denmark.

A national school council was constituted in 2007. The council advises the Minister of Education in questions on academic performance, progress of students and pedagogical, didactical development of basic education. The national school council produces an annual report. One of the key issues has been to support a systematic approach to evaluation and feedback as a way of improving the students' learning supported by classroom management and a varied and framed teaching (Skolerådet 2013; see also Skolerådet 2008; 2010; 2011; 2012).

In addition to these institutions, an independent agency, The Danish Evaluation Institute, was created in the late 1990s. One of its tasks was evaluating and assessing basic education. Furthermore, with the reform of 2014 a national corps of learning consultants has been established. Their role is to advise municipalities and schools on quality development.

Until recently, the national level has played a somewhat smaller part in the governing of lower and upper secondary education compared to some of the neighbouring countries, e.g. Sweden (Normann Andersen, Dahler-Larsen & Pedersen 2009). As a response to Danish students' poor performance in an international comparison, the OECD has recommended strengthening the evaluation culture of primary and lower secondary education (The Ministry of Education 2004)[22]. Since the 1990s, a number of national initiatives have been introduced, as indicated above, to improve the performance of the Danish Folkeskole, see also the OECD report on evaluation and assess-

[22] Since the early 1990s, Denmark has participated in international comparisons conducted by *The International Association for the Evaluation of Educational Achievement* (IEA) and later OECD's *Programme for International Student Assessment* (PISA). The implication of the international comparisons is that the students' academic skills have been defined as a policy problem (Normann Andersen, Dahler-Larsen & Pedersen 2009). Denmark is among the countries spending the highest level of resources per student on basic education – and its results in, for instance, the PISA programme are average.

ment in Denmark.[23] In the spring of 2015, the ministry itself was reorganized in order to be in alignment with the reforms in the area. This resulted in two new agencies: a national agency for quality in education and a national agency for IT and learning.

Besides inspection of the academic quality and the number of hours taught, municipalities and schools are subject to national requirements on evaluation and quality assurance, requiring them to document or at least describe their performance within the centrally defined frame, procedures and standards. Schools are also required to conduct regular evaluations of the students' learning outcome, in order to provide guidance for the student and for the future planning and organisation of the teaching (The Ministry of Education 2008: 3-4).

Common Objectives, study and attainment targets, compulsory exams after the 9th form, national tests and student plans – a form of portfolio that reports the progress of the student – are nationally determined with the purpose of improving the performance and quality of basic education. The yearly student plan is prepared in writing by the teachers for all students at all form levels. The plans contain information about the results of the ongoing evaluations in all subjects and the course of action decided upon based on the results. The student plan is provided to the parents. The regular evaluations of students' learning outcome are to be in accordance with the level specified by the study and attainment targets. With the reform of 2014, the national level takes on an even more active role in the formulation of a clearer national curriculum and general national performance measures, for instance the study and attainment targets mentioned above. This with the intention of providing a more coherent school system and making sure that more attention and effort is focused on the improvement of educational performance.

The municipal level

The frame mentioned above specifies the division of labour between the national and the municipal level. The municipalities 'own' and run the schools. It is the responsibility of the individual municipal board to determine how the municipality's schools are to be organised in practice. The municipal board is responsible for ensuring that every child in the municipality receives a free education in the Folkeskole. The municipal boards themselves determine the municipal level of service and the scope for the Folkeskole within the overriding framework. It can set their own additional objectives and guidelines for the schools as well as launching special initiatives for its own schools. As a result, the municipal board can set targets and the framework for the activities of the school, within the provisions of the Folkeskole Act. As provider of primary and lower secondary education, the municipalities specify, within the national

[23] http://www.oecd.org/edu/school/47696663.pdf.

minimum standards, the exact level of activities, e.g. number of classes taught, additional classes, teacher/student ratio and number of students per class.

The municipal school system is required by national legislation to assess the quality of its local school system. Local educational authorities in the municipalities are to oversee that curricular plans of the schools incorporate and are in accordance with the study and attainment targets, as well as specify how targets are to be achieved. Following approval by local educational authorities, the curriculum is binding for the school. The administration of the school system at the municipal level plays an important supporting role for both the municipal boards and the schools. It is important to note that the municipal school administrations may be organised differently and have different tasks across municipalities. Typically, they have an implementation role when it comes to national legislation and decisions made by the municipal board on, for instance, distribution of resources. It is also at this level that systems for resource distribution and municipal monitoring systems are set up.

The municipalities are required to produce an annual quality report on the performance of their schools. The quality report must describe the municipality's school system, the schools' academic level, the measures that the municipal board has taken in order to evaluate the academic level, and the steps that the municipal board has taken in response to the previous quality report. The report contains information on 1) framework conditions, e.g. number of students per class, teacher-student ratio; 2) pedagogical processes, e.g. the evaluation and assessment of the students' output; and 3) performance, e.g. grades and test results specifying the academic level. One aim of the reports is to further the cooperation between local politicians, local authorities and the schools in relation to their work with evaluation and quality assurance. Finally, the reports are to contribute to transparency, as they are made public (with the exception of test results). As a result of a simplification of the rules, following the 2014 reform municipalities are only obliged to produce a quality report every other year. This new version is termed version 2 of the quality reports. A number of indicators are specified as being part of version 2 of the quality reports. These are the results and attainment targets on academic performance and indicators of student well-being set in the reform (see Section 2.2), average grades correlated for socio-economic background, transition rates to upper secondary education, number of complaints regarding special need education, number of teachers with teaching competencies in the subjects they teach and inclusion rate.

The School and teacher level

Even though, the national level has clarified the national curriculum, schools and teachers have a relatively large influence on the content of teaching within this framework (Calmar Andersen 2006). Each school is responsible for ensuring the quality of the education in accordance with the aims of the Folkeskole and the municipal re-

quirements. They are also responsible for determining the planning and organisation of the programme of education. They are requested to carry out regular evaluations of the students' learning output. As individual organisations, schools often introduce their own systems of quality assurance and evaluation driven by managerial or didactic aims, in order to meet the requirements. In this way, a freedom exists that allows for each school to take the local characteristics into account.

It is the school leader's responsibility to ensure that teachers and other members of staff plan and carry out their work so that it is challenging for all students. The school leader manages and distributes the work among the staff of the schools and makes decisions and adjustments regarding issues related to the students.

At the school level, every class has a class teacher. The class teacher is the teacher among the group of teachers involved with a class that has the main responsibility regarding monitoring and supporting the subject-specific and social development of the students. The class teacher is to ensure coherence and progression for and coordinate the entire programme of the teaching in the class, including organising interdisciplinary teaching and compulsory topics. It is usually the teacher in the subject Danish who takes on the role of class teacher. The class may have the same teachers, including class teacher, from the 1st to the 9th form. However, as organisations schools are commonly organised according to three levels: 1st-3rd form, 4th-6th form and 7th-9th form. As mentioned above, the class usually stays the same with regard to the students, but, according to this model, a new teacher corps will be assigned to the class at the different levels leading to higher specialisation of the teachers. However, one should be aware that there are differences across municipalities and schools, as it is at the discretion of municipalities and schools to decide upon the organising principles in this respect. One trend is that schools may form new classes from the 7th form, redistributing students to new classes. This trend has not been investigated and documented, however.

Traditionally, teachers have had a large degree of autonomy due to their professional status to define 'teaching methods and educational aim'. However, the professionalisation of teachers has been increasingly questioned and discussed. A number of different initiatives have been taken to evaluate the performance of both teachers and students. The precision and clarification of national curricula and standardisation of tests and means of evaluation can be viewed as an instance of this and serve as a means for the state to regulate the behaviour of teachers as professionals (Simola et al. 2011, Normann Andersen 2012). National test results and student plans are means that teachers are now required to use in the planning of the teaching.

Furthermore, school leaders are expected to align the teaching, to a greater degree than previously, in order to ensure that schools attain the result targets and take appropriate action if they do not. Thus, evaluation and other means of holding schools accountable for the results that they obtain play an increasingly important role in the governing of

the Folkeskole ((Normann Andersen & Strømbæk Pedersen 2012); (Bjørnholt, Andersen, Houlberg & Pedersen, 2014).

With the reform of 2014 and the law specifying the framework for utilisation of the working hours of teachers, more managerial authority is given to school leaders with regard to defining the composition of working hours at the school level and of the individual teacher. Moreover, they are required to place more emphasis on living up to the national performance goals.

Teacher Appraisal

No national requirements exist regarding teacher appraisal. The practice for assessing teachers is determined locally – typically at the school level. To perform teaching in the 1st to 10th form, teachers are required by the Folkeskole Act to complete training to become a teacher in the Folkeskole or another teacher training programme approved by the Ministry of Education. It is stated in the legislation that teachers are to have specific qualifications, but no national requirements exist in relation to teacher appraisal. In isolated cases, the requirement can be dispensed, e.g. if persons with special qualifications are employed to teach individual subjects (the Folkeskole Act § 28).

As part of the reform of 2014, a new target has been set. By 2020, all lessons in the Folkeskole are to be taught by teachers who have either obtained main subject qualifications through their teachers training in the subjects they teach, or have obtained corresponding academic qualifications through continued professional development. This target applies to all subjects and all form levels. Prior to this, students may have been taught in various subjects by teachers who had not obtained main subject qualifications in the subjects they taught in.

Teachers' training typically takes places in one of 7 university colleges in Denmark. University colleges are non-profit institutions under public administration. University colleges offer professional bachelor programmes that ensure that the region is covered geographically, as well as in-service training and further training. The Danish initial teacher education (B.Ed. programme for primary and lower secondary schools) underwent a major reform in 2012. The reform took effect in the autumn of 2013. One aim was to significantly improve the academic and professional level of the programme. The reform includes stricter admission requirements as well as a new programme structure based on flexible modules and a competence-based curriculum. The training programme is to provide the students with the knowledge and skills necessary to function as academically, didactically and pedagogically competent teachers in the Danish public school system (Folkeskolen).

Approximately two-thirds of the qualified teachers work in the primary and lower secondary schools. The final third are mainly involved in other forms of teaching, in for

instance private schools, vocational colleges, folk high schools, adult education and social institutions. Some teachers are employed in private enterprises.

The teacher education is a four year programme, corresponding to 240 points in the European Credit Transfer System (ECTS points). The work of a full-time student for one year corresponds to 60 ECTS points.

The programme consists of the following four main elements:

- Basic teaching competencies (60 ECTS points)
- Main subjects (140 ECTS points)
- Teaching practice (30 ECTS points)
- Bachelor of Education project (10 ECTS points)

The structure of the teachers' training programme allows the shifting of up to 20 ECTS points from the main subjects and to 'The teacher's foundational competences' and/or the Bachelor of Education project, in order to allow for different kinds of teacher profiles or specializations. The total number of ECTS points in the teacher training programme must always be 240 ECTS, however.

There is no standard curriculum defining the content of the teachers' education programme. Instead, the programme is regulated through output-based areas of competence, each of which is constituted by a number of practice-oriented skills and corresponding knowledge objectives. The basic teaching competencies' is subdivided into two clusters: 'Pedagogy and the teaching profession' and 'General education'. Pedagogy and the teaching profession prepare the student for developing the fundamental teaching competencies needed to ensure the students' learning, development and well-being. General education prepares the student for implementation of the mission statement of the Danish public school system: to develop professional ethics and to deal with complex challenges in the teaching profession in the context of cultural, value-based and religious pluralism. This part of the teachers' education programme is mandatory for all students. However, various kinds of profiles and specializations are possible.

'Pedagogy and the teaching profession' consists of four areas of competence:

- Student learning and development
- Teaching proficiency
- Special needs and remedial training
- Danish as a second language.

'General education' consists of one area of competence:

- Christian studies/life enlightenment/citizenship (KLM)

The main subjects provide the student with subject-specific knowledge and skills, and they constitute the student's primary areas of teaching competencies vis-à-vis the Danish public schools. The student is expected to qualify to teach between two and four main subjects, with three main subjects being the norm. A student with only two main subjects is expected to have significant specialized knowledge in their chosen subjects. All main subjects in the teachers' training programme directly correspond to the standard subjects taught in Danish Public schools.

The main objective of the teaching practice is to strengthen the student's understanding of and ability to link theory and practice, and for the student to acquire theoretically based practical skills with the aim of preparing, implementing, evaluating and developing their teaching. The teaching practice also aims at developing the student's skills to interact with parents, teachers and other co-workers.

During teaching practice, the student teaches children and participates in other teacher tasks at a primary and/or lower secondary school, a private school (private elementary school) or a continuation school, under the guidance of one or more teaching practice teachers. The Bachelor of Education project tests the student's ability to independently research, investigate, develop and communicate as the basis for professional analysis, evaluation and action-oriented reflection on tasks and challenges in the teaching profession. The project is based on a concrete empirical problem from the Danish public school system or from other equivalent school programmes. The project has to include research- and development-based literature and studies.[24]

Further training can be obtained through courses and subjects on a level with main subjects, further training as a teaching practice teacher, an educational diploma or Master's programmes.

There is no requirement for teachers with regard annual in-service training. The approach to teacher appraisal in Denmark is based on a rationale according to which the teacher appraisal culture primarily is determined locally at each school – and possibly influenced by municipal requirements/guidelines. According to the Folkeskole Act, the school leader is responsible for the quality of teaching at the school, as well as the overall administrative and pedagogical management of the school. Therefore, the school leader is responsible for the dialogue with the teachers and for establishing the requirements/guidelines of the local culture for appraisal. This normally takes place in cooperation with the staff of teachers at the schools.

[24] http://ufm.dk/en/education-and-institutions/higher-education/university-colleges/university-college-educations/bachelor-of-education/the-danish-initial-teacher-education-b-ed-programme-for-primary-and-lower-secondary-schools.pdf

Many municipalities have a requirement – as part of their staff policies – that all employees must have an interview with their leader/manager on employee development for the coming year. The interviews often include a development plan for the employee.

In 2013, 84 per cent of the 64,000 employed persons with a teacher's education as their highest education were employed in teaching. Another 6 per cent were employed in public administration, health and social areas. Thus, a total of 90 per cent were employed in public administration, teaching, health and social areas. Of the persons employed in teaching, 84 per cent were employed in primary and lower secondary schools, and 16 per cent were employed in upper secondary, higher and other education institutions.

The users

There is a long tradition for involving the users of the Folkeskole (parents and the students themselves) in the governing of the schools, including the establishment of school boards in the 1990s (Normann Andersen 2000, Floris & Bidsted 1996). Parental representatives elected among the parents hold the majority in the school boards. Students, teachers and the school leader are also represented in the boards. School boards set the principles for the organisation of teaching and the collaboration between the school and homes. They approve the budget of the school and teaching aids. They set the house rules for the school. Furthermore, parents are expected to engage in the schooling of their children through cooperation between the school and homes.

Other stakeholders

At the national level, the Ministry of Children, Education and Gender Equality cooperates with at least two other Ministries with regard to policy making and implementation. These are the Ministry of Higher Education and Science and the Ministry of Social Affairs and the Interior. The field of responsibility of the former is higher education, while that of the latter is children with special needs. The common themes are inclusion and transition from preschool to basic education and from youth to higher education.

A number of interest organisations are also relevant stakeholders. Local Government Denmark (LGDK) represents all 98 municipalities. It serves as both a political organisation and as an employer's organisation. It focuses on the content of basic education but also on the financing of the Folkeskole. Every year, LGDK negotiates the overall financial frames of the local authorities with the Government. The association of directors of education (Børne- og Kulturchefforeningen – BKF) gathers most directors of education in the municipalities. The teacher and school leader unions are also important stakeholders. They are involved in, for instance, e.g. national negotiations on working conditions etc. The parental organisation 'School and Parents' (Skole og

Forældre) primarily represents the school boards. The Association of Danish Pupils (Danske Skoleelever) takes care of the students' interests.

The Media
The Danish Folkeskole is the subject of heavy debate in the media and among the public in general. One issue has been the educational performance of Danish students compared to other countries, especially Denmark's scores in the PISA studies and the Danish expense level when compared to other OECD countries. Lately, with the introduction of the reform of 2014 and the Act specifying the framework for utilisation of the working hours of teachers the debate has intensified, and various stakeholders in the school system use the media to expose their points of view.

2.5 Market mechanisms in the school system

Every child is assigned to the local Folkeskole in the school district to which they belong, and they have a right to be accepted into that school. Parents are allowed to choose a Folkeskole in another school district, which is obliged to admit the student if there is a vacancy. The school is to admit the student if there are vacancies in the already established classes at the relevant form level. Vacancies are defined as the number of students below the maximum number of students per class set by the municipality within the frame of the national regulation specifying a maximum of 28 students per class. Thus, the school may turn a student from another school district down if it requires them to create a new class. Furthermore, in cases of several students from outside the school district applying for a place in a school, the school may apply criteria for acceptance, for instance whether a student has siblings at the school, the distance between school and the student's home etc.

The parents can also choose a private school that provides education from pre-school to the 9^{th} or 10^{th} form, but the private school can refuse to accept the student. The private schools determine the objectives for the education, but they have to offer an education that commensurates with the Folkeskole. The private schools are also to prepare the students to be citizens in a democratic society. Nevertheless, the private schools in Denmark are highly diverse, and both students from weak and strong socio-economic backgrounds attend the private schools. Even though the private schools and the students in private schools are highly heterogeneous, studies indicate that one of the challenges facing the Folkeskole is that the students of private schools in general have a more advantageous socio-economic background compared to the students of the Folkeskole (Tornhøj Christensen & Ladenburg 2012).

The private schools receive a public grant per student per year for their operational expenditures. The grant equals 71 per cent of the average expenditure per student per year in the Folkeskole. A smaller grant from the national government supplements the

municipal grant, and in addition to this the parents pay a fee, which varies from school to school. The average parents fee is about 1,000-2,000 DKK per month (www.borger.dk).

The municipality is obliged to pay for students' transportation, if the student lives more than 2.5 km from the Folkeskole in which he/she is enrolled (The Ministry of Education 2014a: § 24). If the parents choose another school for their child, they lose the right to free transportation.

Research shows that, on average, private schooling has no significant effect on school leaving examination scores (Calmar Andersen 2008b). However, heterogeneous effects exist as, on the one hand, private schools with students with a high average socio-economic status perform better than similar public schools. On the other hand, private schools with students with low average socio-economic status perform less well than their public counterparts.

Competition from private schools does not seem to improve public school student performance. In contrast, more competition from private schools implies higher public school spending (Calmar Andersen & Serritzlew 2007).

As mentioned, more than 82 per cent of the children of school age attend the Folkeskole. About 15 per cent attend private schools, and the number is slightly increasing, see also Section 2.2. The number of private schools is also increasing (see Table 5.1 in Chapter 5).

Table 2.9 Students in public and private schools

	2007	2008	2009	2010	2011	2012	2013
Folkeskole	83 %	83 %	83 %	82 %	81 %	81 %	81 %
Private Schools	13 %	14 %	14 %	14 %	15 %	15 %	16 %
Continuation schools	4 %	4 %	4 %	4 %	4 %	4 %	4 %
Total	100 %	100 %	100 %	100 %	100 %	100 %	100 %

Source: Statistics Denmark, U194.

This trend with more students attending private schools may be due to the structural reforms in the municipalities of the Folkeskole leading to closure or merging of public schools. However, no systematic studies have been conducted in this area.

When the students reach 14-18 years of age, they have the opportunity to attend an independent continuation school for lower secondary students, also termed boarding schools. The continuation schools are – like other private schools – to meet the common objectives set for the Folkeskole. There is a subsidy for continuation schools. However, the parents also pay a substantial tuition fee for continuation schools. The

tuition fee varies between schools and depends on the parents' income and the number of children in the family, as the students receive public grants based on these factors.

Only about 2 per cent attend a continuation school in the 8th form, but in 9th form about 13-14 per cent of the students, and in 10th form more than 40 per cent of the students do this.

Table 2.10 Percentage of students attending a continuation school

Percentage	2007	2008	2009	2010	2011	2012	2013
8th form	2.5	2.2	2.2	2.0	2.0	2.1	2.1
9th form	13.5	13.8	13.7	13.0	13.5	12.7	12.8
10th form	42.8	43.5	43.2	44.1	43.0	42.0	44.1

Note: Students in form 10 includes a limited number of students in form 11. This may be bilingual students in need of further competencies in order to be enrolled in vocational or upper secondary education.

Source: Statistics Denmark.

There are different sources of information that guide the choice of school. As mentioned above, every second year the municipalities are to publish a quality report that describes how the Folkeskole are doing with regards to attaining national and local objectives. This also serves as a means to inform parental choice of schools.

Also, for each school the Ministry of Education publishes the average results from the compulsory school leaving examination at the end of the 9th form. The results are controlled statistically for the student's socioeconomic background.

The individual Folkeskole is allowed to brand a particular profile, for instance, by offering elite sports, international 'classes', where most subjects are taught in English, or 'classes' for students who want a more challenging education. Thereby, they can endeavour to attract students, or retain their 'own' students.

As shown in Section 2.2, an increasing number of students attend private schools. This puts pressure on the Folkeskole and also on the resource management of the school system in each municipality. In light of restructuring the Folkeskole through, for instance, closing down or merging schools, many municipalities tell of parents choosing an existing private school as an alternative, or new private schools have been established in the area. In such cases, the municipalities do not achieve the expected efficiency of the restructuring of the school system, as their capacity in the Folkeskole is lower than expected and as they also have to pay the subsidy to the private school.

2.6 Performance of the school system

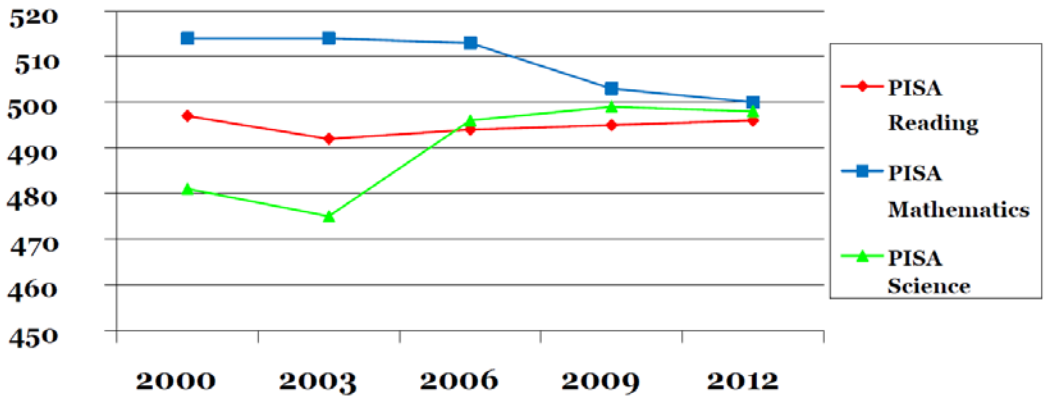
99 per cent of the children that enter primary and lower secondary school complete. Less than 1 per cent of the students resit a school year (Mehlbye & Søndergaard Pedersen 2014).

In 2012, approximately 20 per cent of the adult population (30-59 years) only had lower secondary school as their education. About 45 per cent had completed upper secondary school, and about 35 per cent had obtained tertiary education (The Ministry of Finance 2014). The level of education in the Danish population is increasing. However, the PIAAC survey in 2011 showed that the skills of the adult Danish population in literacy, numeracy and problem solving in technology-rich environments was a little below the international average (Rosdahl 2014).

The political goal is that 95 per cent of each cohort of students graduating from the Folkeskole complete at least a youth education, i.e. an upper secondary or vocational education education, see Section 2.1. In addition, it is a goal that 30 per cent of a cohort choose a vocational education. The proportion of each graduating class that chooses upper secondary and vocational education is increasing. Measured according to the 25-29 year old citizens, for instance, the share of this age group completing an upper secondary or vocational education increased from 80.3 per cent in 2007 to 82.3 per cent in 2014. A profile model on educational behaviour estimates that 93 per cent of the year group completing 9th form in 2015 will complete an upper secondary or vocational education. 50 per cent of the students that continue into upper secondary and vocational school choose general schools (The Ministry of Finance 2014). In this way, transition rates to youth education are applied as an indicator of the performance of the schools.

Compared to other countries, e.g. England, Denmark has been a late starter with regard to performance-based management (Simola et al. 2011: 105). Denmark's participation in international comparisons of student achievement changed this (Simola et al. 2011: 99, 101, Normann Andersen, Dahler-Larsen & Pedersen 2009) because of Danish students' relatively poor performance in these tests. The PISA results have given rise to debate, as some are of the opinion that the Danish students ought to have better results than the international average result. The PISA test is questioned by critics on the grounds that it does not measure skills such as problem-solving, innovation, creativity and cooperation – skills that the Danish students are generally assumed to hold to a large extent.

Figure 2.1 Danish results in PISA 2000-2012 (The Ministry of Education)



Danish students are also measured using several other international standardized instruments. In general, Danish students score above the international average (see Table 2.11). In the **ICCS 2009** measuring Civic and Citizenship Education, Denmark holds the prime position, cf. the fact that preparing the students for becoming members of the Danish society is part of the preamble for the Folkeskole.

Table 2.11 Danish students' performance in international tests

Test	Result	Comment
PISA 2012	On or just above the average international score (Egelund 2013)	See text
TIMSS 2011 (Trends in International Mathematics and Science Study). **Measures the skills in the 4th form.**	Above average (Allerup 2012)	The students scores have improved since 2007
In PIRLS 2011 (Progress in International Reading Literacy Study). **Measures the skills in the 4th form.**	Among the 11 best countries (Mejding & Rønberg 2012)	-
ICILS 2013 (International Computer and Information Literacy Study)	In the best third (Bundsgaard, Pettersson & Puck 2014)	The study was conducted for the first time in 2013
ICCS 2009 (International Civic and Citizenship Education Study). **Measures the students' understanding of politics, democracy and citizenship.**	Prime position (Skolestyrelsen 2010)	In the ICCS 2009, the Danish Students share the prime position with Finland and have a highly skilled group of students that no other country matches.

The students' educational performance in primary and lower secondary school is also measured using several other instruments, such as the national testing described in Section 2.3, and the school leaving examination in the 9th form. The students' performance is measured on a 7-point grading scale. Additionally, students receive continuous assessment marks from the 8th form on. Furthermore, indicators such as the well-being of students are also applied as part of the performance monitoring. The first results on the national survey on the wellbeing of the students was made available in April 2015. Some of the indicators measuring the wellbeing of students are "Do you like your school?", Do you like your teachers?", "Do you feel lonely at school?". Other items relate to the inter-student relations, how well they feel that teachers assist

them, whether they are challenged in and have influence on the teaching. Overall, the results are positive in relation to the wellbeing of Danish Students. However, there may be a tendency for younger students to be more positive compared to the older ones. The items are not measured according to the same standards, as the questions and question techniques in the surveys posed to students in lower form level's differs from those used for higher form levels.

There are differences in performance across groups of student (see Table 2.12 below).

Socioeconomic status has a high impact on the general performance – stronger socio-economic background is associated with better results. Ethnic groups score lower compared to Danish students. Boys perform better than girls in maths (PISA test and school leaving examination). However, the performance of girls is higher when it comes to reading and writing and IT (PISA, school leaving examination, Pirls, ICILS).

Compared to students in the Folkeskole, students in private schools generally perform better at the school leaving examination. Moreover, students from large schools show better performance compared to students from small schools. However, it is uncertain whether the difference is due to differences in the students' socioeconomic back-ground.

Table 2.12 The relative performance of different groups of students in international tests

	Socioeconomic Back-ground	Gender	Ethnic Groups	Private schools	Schools size
PISA	High impact in Maths Reading: ? Science: ? (Egelund 2013)	Boys do better than girls in Maths (relative high difference) and science. Girls do better than boys in reading (Egelund 2013)	High impact in reading, maths and science (Tornhøj Christen-sen et al. 2014)	-	-
TIMMS (Allerup 2012)	High impact.	-	High impact* ***	No impact*	No impact
PIRLS (Mejding & Rønberg 2012)	High impact**	Girls do better than boys (Relative low difference)	High impact***	-	-
ICILS (Bundsgaard, Pettersson & Puck 2014)	High impact	Girls do better than boys	-	-	-
ICCS (Skolestyrel-sen 2010)	High impact (a)	-	Ethnic students have a lower score (b)	-	-
School leaving examination (The Ministry of Educa-tion 2014e)	High impact	Girls do better in writing, boys do better in maths	High impact (c)	Students in private schools do better (d)	Students in larger schools do better (d) (Lund 2010)

* The results are controlled statistically for the student's socioeconomic background.

** Measured as number of books in the home.

*** Students from an ethnic group are defined as students who do not always speak Danish at home.
a: The Danish students with low socio-economic status have a high score compared to the corresponding groups in other countries.
b: The ethnic students have a high score compared to the corresponding groups in other countries.
c: Some ethnic groups scores higher than Danish students, when socioeconomic status is taken into account.
d: It is uncertain whether the difference is due to differences in the students' socioeconomic background.

Furthermore, Denmark is also part of the OECD's comparisons, "Education at a Glance", most recently in 2013 (OECD 2013) and 2014 (OECD 2014). These comparisons achieve a large degree of political awareness regarding for instance the correlation between the cost and performance of the Folkeskole compared to other countries.

2.7 Policy approaches to equity in education

With the reform of 2014 a prime aim is to reduce the influence of the students' socio-economic background on their educational performance. Thus, more attention is paid to children from socio-economically disadvantaged homes. The reform rests on an assumption that more and better education will be to the advantage of this group of students. One means in the reform is a proposal on homework assistance for all students. Due to disagreement among the parties at the national parliament that settled the reform of 2014, homework assistance is voluntary in the first year of the reform (school year 2014/2015).[25] As part of the political agreement on the reform of 2014, it was decided that, after next parliamentary elections, homework assistance would be mandatory, and accordingly homework assistance will be mandatory as of the school year 2015/2016.

The share of students in the Folkeskole from an immigrant background has been fairly stable over the last six years and is 10.5-10.8 per cent of the students in the Folkeskole.

Table 2.13 The share of immigrant students in the Folkeskole 2008-2013

	2008	2009	2010	2011	2012	2013
Total number of students	597,619	594,746	590,842	578,548	580,960	574,522
Number of students from an immigrant background	62,528	63,011	62,927	61,649	62,691	61,700
Share of students from immigrant background (%)	10.5	10.6	10.7	10.7	10.8	10.7

Note: Early September figures for pre-school (form 0) to 10th form. Figures include students in special schools and municipal youth schools. Municipal youth schools are often the organising unit for the voluntary 10th form. Figures for September 2014 not yet available.

Source: Databank of the Ministry of Education, http://statweb.uni-c.dk/databanken/uvmDataWeb/MainCategories.aspx?, EGS.

Teaching in Danish as a second language is provided when necessary to bilingual children in pre-school class and in the 1st to 9th form (The Ministry of Education 2008). If the school leader assesses that a bilingual student needs basic instruction in Danish,

[25] In Denmark, there is a parliamentary tradition for settlement (forlig). Thus, Revisions of the Folkeskole Act require agreements.

the student will receive teaching in a reception class, in a team or as individual instruction (The Ministry of Education 2008)[26].

In general, immigrant students of a non-western background perform less well than their native peers in both PISA tests (Rangvid 2007, Rangvid 2010b) and the school leaving examinations (Houlberg, Østergaard Larsen & Rangvid 2013). Differences in socio-economic status account for only 50 per cent of the ethic test score gap (Rangvid 2007), and after controlling for socio-economic status first-generation and second-generation immigrants, respectively, achieve 1.25 and 0.75 lower average marks[27] at the school leaving exams in Danish and Mathematics than their native peers (Houlberg, Østergaard Larsen & Rangvid 2013). Even after controlling for socio-economic status, a substantial gap for the immigrant students thus remains.

2.8 Main challenges

According to the political agreement behind the 2014 reform of the Folkeskole, the academic performance of Danish primary and lower secondary education is not ranked at a sufficiently high level compared to other OECD countries to which Denmark usually compares itself. According to OECD studies, the expenditures for primary and lower secondary education are relatively high in Denmark compared to other countries. In this light, a general challenge for the national level is to provide a governance framework for a more effective use of school resources. In a fiscally decentralised system like the Danish, this includes establishing a governance framework that facilitates local decision making that matches resource utilisation to the local needs and contributes to the most suitable local solutions in order to improve the educational performance of the students. One of the means for achieving this in the present governance agenda is by an extended and more qualified use of performance management. The overall goal is to raise students' academic achievement and wellbeing, especially for students with special needs.

At the local level, many municipalities are challenged by demographic changes and face a continuous need for adjusting resources and school facilities to a declining number of school-aged children. At a more general level, an ongoing debate concerns the question of striking the appropriate balance between national governance and local autonomy. In line with every governance system, the governing of Danish primary and lower secondary education is continuously in search of the right balance of authority and co-operation between the three layers of governance – the national, municipal and school levels – regarding the need for ensuring implementation of national goals and

[26] 'Bekendtgørelse om folkeskolens undervisning i dansk som andetsprog' (BEK no. 690 of 20/06/2014).

[27] The 7-point grading scale consists of five marks designating a passing level (12, 10, 7, 4 and 02) as well as two marks designating a non-passing level (00 and -3). See (The Ministry of Education 2008).

reforms in primary and lower secondary education along with the need for simultaneously ensuring local autonomy and adaptation.

The Danish system deliberately allows for diversity across municipalities regarding, for instance, how to budget and allocate the appropriate level of resources needed in the area, foresee the number of students attending private schools and foresee costs of special needs education. A relatively large proportion – based on the number of students attending special needs education – of the funds have recently been allocated to special needs education, and a national aim is to include a larger number of students with special needs in ordinary education. Presently, there is a need for more knowledge on the inclusion strategy's consequences for student performance and well-being in the Danish context. Many teachers do not feel professionally equipped to handle the challenges associated with inclusion and feel that they need further skills, especially in relation to difficulties among students with development and attention disorders and socio-emotional difficulties.

In recent years, an increased focus on effective use of resources has been on the agenda in the municipalities. The spending for primary and lower secondary education has been reduced, and structural changes in the number and size of schools have taken place. This can be seen as a sign of improved efficiency. However, no systematic knowledge exists on the reasons for the changing resource levels and the consequences of the effectiveness of the Folkeskole in relation to the goals in the Folkeskole Act. One preliminary indicator of the reduced resource level being a result of an improvement in effectiveness is that the performance of Danish students in the PISA test has been fairly stable from 2006-2012, though with a poorer result in maths from 2006-2009/2012. However, it is too soon to base any firm conclusion on this, as there will be a time delay with regard to changes in expenditure levels and student performance. Thus, no valid knowledge exists so far as to whether the increased efficiency indicated by the reduced costs of the Folkeskole is also indicative of increased effectiveness in relation to the overall goals of the Folkeskole.

One of the challenges for the Danish Folkeskole at the school level is the implementation of the reform of 2014 and the Act specifying the framework for utilisation of teachers' working hours. The reform set standards for a new way of organising the school day. In this capacity, more managerial competencies are required of school leaders compared to earlier. The question is whether there is sufficient knowledge and management capacity at all levels and across levels for the implementation of such a huge reform – and whether the implementation task has been distributed in an appropriate way across the three levels, particularly with regard to cooperation between the municipal and school level. One means to ensure implementation capacity could be competency development of teachers and schools leaders. As part of the reform, 1 billion DKK has been granted for this purpose. But again no certain knowledge on the

effect of such competency development currently exists. A further challenge is the simultaneous implementation of the legal framework for the utilisation of working hours of the teachers.

There is an ambition regarding an increased strategic use of available data, evaluation knowledge and performance information at all levels of primary and lower secondary education in order to improve quality and performance. A challenge in relation to this is the question of sufficient evaluation capacity building, i.e. whether there is sufficient capacity at all levels of the system to collect, systematize and utilise evaluation data for learning purposes and informed decision making.

Main lines of discontent

The Danish school system rests upon a delicate balance between central guidelines and decentralised execution. Each stakeholder may hold different interests in that respect. However, there is a widespread consensus on one common Folkeskole with room for local adaptation. The municipal foundation of the school system has long traditions and is widely accepted.

Legal intervention ended a long historical tradition for working hour regulations being a matter between the teachers' union and LGDK. The lock-out prior to the legal intervention was based on a disagreement between the two stakeholders on the right to decide on the scope and content of various teacher tasks. The Teacher's Union was opposed to the fact that the municipalities and school leaders were granted more discretion at the expense of the nationally negotiated framework for the scope and content of the teachers' tasks.

3 Governance of resource use in schools

As stated in Chapter 1, the present chapter, as well as the three following chapters, are basically based on a systematic review of scientific articles, books, national evaluations and consultancy reports.

However, in order to understand the context of the reviewed studies the chapter will start by introducing the relevant regulatory framework and describe the main trends with regard to governance of resource use.

The national level is responsible for the legal and financial governance framework of the Danish school system, including the overall responsibility for interfaces and financial distribution across levels of the school system. However, within the framework set by the Folkeskole Act and the regulations issued by the Ministry of Education (see Chapter 2), the municipalities are granted full financial and organizational responsibility for the Folkeskole. The Folkeskole is one of the core tasks of the municipalities. In financing of the Folkeskole, the municipalities are not allowed to finance schools by user fees but are to finance school expenditures by revenues from local taxes and general grants from the central government. No general state funding is directly allocated to the Folkeskole, and no state reimbursements of school expenditures are given.[28]

The cost of primary and lower secondary education in Denmark in 2010 amounted to 3.1 per cent of GDP (OECD 2014).

The overall framework for local government service expenditure is determined in the annual negotiations of the municipalities' economy between the Government and Local Government Denmark (LDGK)[29]. Within this framework, it is possible to prioritise expenditure partly internally between the municipalities and partly across the sectors in each municipality (The Ministry of Economic Affairs and the Interior 2014b). In the economic agreement between the Government and LGDK for 2014, the frame for the main component regarding municipal service expenditures was agreed to be 230.5 billion DK.

The economic agreement between the Government and LGDK is an agreement of the tax and expenditure level for the municipalities collectively. No frames are set for the individual municipality, and the agreement is not binding for the individual municipality. However, in order to keep the collective budgets of the municipalities within the agreed level LGDK coordinates the budget processes of the individual municipalities. If the total expenditures of the municipalities do not stay below the expenditure ceiling in the budgets, and in the final accounts, the municipalities are both collectively and

[28] However, the national level may fund particular programmes additionally. For instance, 1 billion DKK has been earmarked by the national level for competency development of teachers and school leaders in relation to the new Folkeskole reform.

[29] The economic agreement for the municipal economy 2014 between the Government and Local Government Denmark

individually sanctioned by the national Government according to the 'budget law' (see Section 1.3).

The municipal expenditures are mainly financed by local taxes and general grants from the state. These two revenue sources in the budgets for 2014 account for 71 per cent and 26 per cent of the total municipal revenue, respectively (The Ministry of Economic Affairs and the Interior 2014b).

The municipalities' tax revenue comprises:

- Income tax, land tax and service charge: Tax sources of which the municipalities are able to influence the proceeds.
- Other tax revenue such as company tax, researcher tax and estate tax: Tax rates determined by the state. The municipalities receive a fixed share of the overall proceeds.

The average income tax rate in 2014 was 24.9 per cent, and most of the rates range between 24 and 25.9 per cent (The Ministry of Economic Affairs and the Interior 2014b).

The general grants from the state are mainly allocated to the individual municipalities according to an equalisation scheme aimed at evening out the differences in the economic situation in the municipalities due to differences in tax base, composition of age groups and social structure (The Ministry of Economic Affairs and the Interior 2014b)[30]. The aim is not to equalise the service levels, as that is a local policy priority, but to give the municipalities approximately the same financial basis on which to solve their tasks.

The equalisation scheme is based on the so-called net equalisation method. This means that the equalisation is calculated on the basis of a municipality's estimated structural surplus or deficit, i.e. the difference between a municipality's estimated expenditure needs and its tax revenue based on an average tax rate (The Ministry of Economic Affairs and the Interior 2014b). The equalisation scheme is complex and includes a set of special subsidies and equalisation schemes. However, the main elements are a national equalisation scheme covering all municipalities and an additional capital equalisation scheme for the municipalities in the capital area.

In the national equalisation scheme 58 per cent of the difference between the estimated expenditure needs and the estimated tax revenue are equalised. In the capital equalisation scheme, an additional 27 per cent of the difference between the estimated expenditure needs and the estimated tax revenue are equalised. Besides the national and

30 A part of the block grant is used to finance national equalisation and equalisation subsidies for municipalities with a high structural deficit. The remaining part is as a general rule allocated to the municipalities by population (The Ministry of Economic Affairs and the Interior 2014b).

capital equalisation scheme, equalisation subsidies for municipalities with a high structural deficit are given, subsidising 32 per cent of the part of the difference between the municipality's estimated expenditure needs and the estimated tax revenue which exceeds the national average difference (The Ministry of Economic Affairs and the Interior 2014b).

In calculating the structural surplus or deficit, the formula for estimating the expenditure needs of the individual municipalities is based on two major components:

- Demographic expenditure needs
- Socio-economic expenditure needs.

The demographic expenditure needs are estimated based on the population's distribution in a number of age groups and an estimated unit amount per inhabitant for each age group. Especially the number of children and old people affects the age-related expenditure needs (The Ministry of Economic Affairs and the Interior 2014b). Besides the age composition, an indicator of the dispersal of settlement is also included in the estimation of the demographic expenditure needs (The Ministry of Economic Affairs and the Interior 2014a).

The socio-economic expenditure needs are estimated on basis of a number of criteria regarding the socio-economic burden in the municipality. These are elements that do not necessarily give rise to local government expenditure, but based on experience they can be used as indicators of the socio-economic burden in the municipality. The socio-economic expenditure needs are estimated based on a socio-economic index calculated by weighing the criteria using different weights. The criteria in the national equalisation scheme 2014 are shown below along with their weights[31] (The Ministry of Economic Affairs and the Interior 2014b, Table 1.5):

- 20-59 year olds without employment over 5 per cent (19 per cent)
- 25-49 year olds without vocational training (16 per cent)
- Rented apartments (5 per cent)
- Psychiatric patients (5 per cent)
- Families in certain types of housing (15 per cent)
- Children in families where the parents have little or no education (8 per cent)
- Singles of 65 years and older (2.5 per cent)
- Individuals with a low income in three out of four years (8 per cent)
- Number of mentally handicapped (5 per cent)
- Number of immigrants and descendants (3 per cent)
- 20-59 year olds with basic skills (5 per cent)

[31] The weights in the capital equalisation scheme are not identical.

- Estimated annual reduction of the population (2 per cent)
- Children with single parents (4 per cent)
- Children who have moved to another municipality at least three times (2.5 per cent).

Within the framework of the national legislation and the agreement between the Government and LGDK, the municipal councils have autonomy to decide the allocation of resources across sectors, including the size of the budget for the Folkeskole and the principles for allocating resources to the individual schools. A basic idea of this decentralised system with local decision making autonomy is to allocate resources according to local needs and preferences.

Of the total service expenditures of 230.1 billion DKK in the municipal budgets for 2014, expenditures for the Folkeskole at large amounted to 53.7 billion DKK[32] or 23.3 per cent of the service expenditures. This includes municipal grants to private schools equalling 3.9 billion DKK in the 2014 budgets. The municipalities are obliged to fund private primary and lower secondary schools. The municipal grant per student in private schools is fixed across municipalities and set each year in the Finance Act of the national government and calculated as a percentage of the average municipal expenditures per student in the Folkeskole. In the Finance Act for 2015, the municipal grant per student in private schools is DKK 34,017.[33]

The total current municipal expenditures for primary and lower secondary schools, including special schools and grants for private schools, increased from 2007 to 2009 (see Table 3.1). Since 2009, the expenditures have been gradually decreasing and in the recently published accounts for 2014 equalled 53.0 billion DKK. In the same period, the number of school-aged children has been declining, and accordingly the expenditure per school-aged child have been slightly increasing. However, from 2009 when school expenditures peaked, the expenditures were reduced from 74,700 per school-aged child to 71,900 per school-aged child in 2014, equalling an expenditure reduction of 3.7 per cent per school-aged child from 2009 to 2014.

From 2009 to 2014, the total current municipal expenditure for the Folkeskole at large were reduced by 3.5 billion DKK, equalling approximately 6.3 per cent of the expenditures. Seen over the entire period from 2007 to 2014, the expenditures were reduced by 1.7 billion DKK, or 3.0 per cent of the expenditures.

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[32] Including joint costs for the Folkeskole, school buses, home education, school-based leisure time, special schools and municipal payment to private schools. Source: Statistics Denmark, www.statistikbanken.dk, BUDK32

[33] http://www.uvm.dk/~/media/UVM/Filer/Adm/PDF14/Aug/140826%20Kommuner.pdf

Table 3.1 Total current municipal expenditures of primary and lower secondary schools (DKK 2013 prices)

	2007	2008	2009	2010	2011	2012	2013	2014
Total current municipal expenditures of primary and lower secondary schools, 2013 DKK prices in billions.	54,618	54,954	56,517	55,629	53,710	52,772	51,361	52,953
Average current municipal expenditures of primary and lower secondary schools per inhabitant aged 6-16, DKK, 2013 prices.	72,056	72,528	74,682	73,904	71,673	70,991	69,514	71,910

Note: All averages are weigthed averages.

The figures for total current and average current municipal expenditures of primary and lower secondary schools are based on municipal accounts and include: Folkeskoler (account 3.22.01), Joint municipal costs for the school system (3.22.02), Home education (3.22.03), Special guidance (3.22.04), School busses (3.22.06), After-school care (3.22.05, 5.25.15 and 5.25.16), Special needs education in regions (3.22.07), Municipal special schools (3.22.08), Payment to private schools (3.22.10), Continuation schools and boarding schools for young people (3.22.12) Youth educational guidance (3.22.14), Sports facilities for children and young people (3.22.18) and – from 2014 – Further education (3.22.09).

Average expenditure per student in the Folkeskole is based on the financial accounts of the municipalities and cover Folkeskoler (account 3.22.01), Joint municipal costs for the school system (3.22.02) and school busses (3.22.06).

Expenditures are not adjusted for changes in tasks. Expenditures in 2013 are presumably underestimated due to a lock-out of teachers in the spring of 2013.

Source: The Ministry of Education, Statistics Denmark and ECO Nøgletal

Turning to the Folkeskole, municipal autonomy is reflected empirically in the fact that the annual expenditures per student vary between 52,000 DKK and 72,000 DKK in the municipal accounts for 2013, see Table 3.2.

The average cost per student in the Folkeskole is 61,190 DKK (2013) and decreased from 2010 to 2013. Regarding the 2013 figures, it is important to emphasize that, the average cost in 2013 is presumably underestimated due to lock-out of teachers in the spring of 2013.

Table 3.2 Average municipal cost per student in the Folkeskole 2010-2013 (DKK 2013 prices). Excluding municipal and regional special schools

	2010	2011	2012	2013
Average	66,126	63,626	63,013	61,190
Min.	56,496	53,031	52,393	51,611
Max.	85,199	74,483	76,341	72,271
1st quartile	60,820	59,637	59,152	57,217
Median	65,997	64,025	62,265	60,193
3rd quartile	69,629	67,785	67,818	65,828
Standard deviation	5,786	4,765	5,327	5,532

Note: The costs of the Folkeskole are based on the financial accounts of the municipalities and cover Folkeskoler (account 3.22.01), Joint municipal costs for the school system (3.22.02) and School busses (3.22.06). Expenditures in 2013 are presumably underestimated due to lock-out of teachers in the spring of 2013.

Source: KORA. A study by KORA conducted to determine the municipalities' average production costs in a number of service areas (called 'enhedspriser' (unit costs))

The remaining part of the chapter is based on the studies reviewed. The following subthemes guide and structure the presentation:

- Policy priorities/differences in spending per student across regions or type of municipality
- Implementation of policies
- Responsibilities across levels of the school system
- Sources of revenue
- Benchmarking of efficiency or effectiveness/best practices.

3.1 Overview of studies

Below, an overview is provided of the studies included in the systematic review addressing the theme 'Governance of resource use in schools'. The table presents information on the type of study, e.g. research article or national evaluation, subthemes addressed, e.g. policy priorities, source of revenues, allocation of resources and monitoring resource use. In addition, the type of resource is indicated as either financial, human (e.g. teachers and school leadership), physical (school facilities and materials) or targeted programs (e.g. special education needs programs or programs for gifted students). Next, the data type is indicated, e.g. whether the study applies a quantitative or qualitative methodology. Finally, the unit of analysis is presented, e.g. students, teachers, schools, municipalities or national level. For each study, it is stated whether they:

- include policy initiatives
- have causal ambition as their explanatory frame
- whether this causal ambition is matched in the study by satisfactory methodological strength.

All studies focus on primary and lower secondary education in Denmark.

Table 3.3 Key information about the reviewed studies. Studies of governance of resources

Ref. Id	Author(s) and publication year	Type of study	OECD Theme	Sub-theme	Data type	Type of resources	Unit of analysis (N)	Data year	Study of Policy Initiatives?	Causal ambition?
[19]	Calmar Andersen (2008) *Private Schools and the Parents that Choose Them*	RA	GO	GO4	QT-R	FI	ST(34480)	2002	Yes	Yes
[21]	Calmar Andersen & Serritzlew (2007) *The Unintended Effects of Private School Competition*	RA	GO	GO1	QT-R	FI HU PH	ST>(45000) SC(1321)	2002	No	Yes
[134]	Nielsen & Bækgaard (2015) *Performance Information, Blame Avoidance, and Politicians' Attitudes to Spending and Reform*	RA	GO	GO1	QT-S	FI PH	MU (98) Survey with 844 local politicians.	2012	No	Yes
[179]	Houlberg et al. (2013) *Benchmarking og effektivitetsanalyse på folkeskoleområdet*	RR	GO RD	GO1 GO5 RD6	QT-R	FI	MU(98) ST(135349)	2008-2010	Yes	Yes
[210]	Wittrup & Bogetoft (2011) *Effektivisering i folkeskolen. Muligheder og metoder*	NG	GO RU	GO1 GO5 RU1	QT-R-	HU	SC(704-1046)	2007-2009	Yes	Yes
[211]	Teglgaard Jakobsen et al. (2012) *Økonomi og faglig kvalitet i folkeskolen – hinandens modsætninger?*	NG	GO RU	GO5 RU1	QT-R	HU	SC(1036)	2007-2009	Yes	Yes
[228]	Normann Andersen & Dahler-Larsen (2008). *The framing of public evaluation data and the legislation on openness and transparency in Danish schools*	RR	GO RM	GO2 RM2 RM4	QL-IV-TX	HU	Content analysis	2001-2004	Yes	No
[232]	Norman Andersen & Strømbæk Pedersen (2012) *Evaluering af (og i) den danske offentlige grundskole*	RA	GO RM	GO2 RM1 RM4	QT-S	HU	SC(750) TE(760)	2007-2008	Yes	No
[238]	Rangvid, B. (2008) *Private School Diversity in Denmark's National Voucher System*	RA	GO	GO1 GO5	QT	HU	SC(360)	1985-1992	No	Yes
[270]	Andersen et al. (2012) *Indsatser for tosprogede elever*	RR	GO RD	GO2 RD6	QT-R-S	TP	MC(54) ST(55876) TE (154-303)	2010-2011	Yes	Yes
[279]	BDO (2010) (a minor part has been updated with data from 2013) *Opgørelse af udviklingen i udgifterne til undervisning i folkeskolen pr. elev*	CI	GO RD	GO1 RD6	QT-R	FI	MC(98-270)	2002-2009(2013)	No	No
[280]	Behrens et al. (2010) *Analyse af kommunernes udgifter pr. elev til folkeskolen*	NG	GO	GO5	QT-R	FI	MC ST	2008	No	No
[281]	Skolens rejsehold (2010) *Baggrundsrapport til Fremtidens folkeskole*	NG	GO RD RM	GO1 GO2 GO5 RD2 RM1 RM3	QT-QL-S-R-IN	FI HU TP	NA MC (3) SC (37)	2010	No	No
[283]	Deloitte (2010) *Analyse af specialundervisning i folkeskolen*	CI	GO RD RM	GO1 GO5 RD1 RM1 RM2	QT-QL-S-R	FI TP	MC(12)	2008-2009	No	Yes
[288]	Rambøll (2010) *Udgifter til folkeskolen. Analyse af to kommuner*	CI	GO RD RU	GO5 RD3 RD6 RU1 RU4	QT-QL-R	FI HU PH TP	MC(2)	2008-2010	No	No
[314]	COWI (2010) *Undersøgelse af betydningen af socioøkonomiske faktorer for kommunernes udgifter til dagpasning, skole og ældre*	CI	GO	GO1	QT-QL	HU	MC(6-98)	2008	No	No
[319]	Astrup Bæk (2014) *Kommunernes økonomiske implementering af folkeskolereformen*	RR	GO RU	GO2 RU4	QT-S	FI HU TP	MC(75)	2014	Yes	No

[320]	Tornhøj Christensen & Ladenburg (2012) *Privatskolerne og det sociale ansvar*	RR	GO RD	GO3 RD4	QT-R	HU	SC (2009) ST(660000)	2009-2010	No	No
[324]	Simola et al. (2011) *Governing by Numbers*	RR	GO RM	GO2 RM1 RM4	QL		NA(5)	-2007	Yes	No
[327]	Wittrup et al. (2013) *Notat om kommunal benchmarking*	RR	GO	GO1 GO5	QT-R	FI HU	MU(94)	2009-2011	Yes	Yes
[329]	Dørken & Grønlund Andersen, (2010) *Op og ned er lige langt*	NG	GO	GO1	QT-R	FI	MU (33-275)	1996 - 2009	No	Yes
[345]	Bogetoft & Wittrup (2011) *Productivity and education*	RA	GO RU	GO1 GO5 RU1	QT	HU PH	ST(330-1400)	2007-2009	Yes	Yes
[353]	Hoest et al. (2013) *Increasing the admission rate to upper secondary school*	RA	GO RU	GO5 RU1	QT-R	TP	ST(15013-201546) SC(262-998)	2002-2007	Yes	Yes
[365]	Moos et al. (2008) *Successful principals: telling or selling?*	RA	GO	GO2 GO3	QL-TX-IV	HU	SC(4-5) NA(3)	2003-2009	No	No
[379]	Baviskar et al. (2014) *Kommunernes omstilling til øget inklusion pr. marts 2014*	LG	GO RD RU RM	GO2 RD1 RD6 RU2 RM3	QT-R-S-QL-IN	FI HU TP	MC(12) SC(68)	2010-2014	Yes	No
[392]	Calmar Andersen, & Bjerre Mortensen (2010) *Policy Stability and Organizational Performance*	RA	GO RD	GO5 RD2	QT-R	FI	MC(270) ST(140000)	2002-2005	No	Yes
[393]	Rambøll (2013) *Evaluering af de nationale test i folkeskolen*	CI	GO RD	GO2 RD6	QT-R-S	TP	ST(>130000) SC(728)	2012-2013	Yes	Yes
[403]	Laier Christensen (2009) *Sammenhængen mellem kommunernes udgifter til skoledrift og skolens undervisningsresultater*	CI	GO RD	GO1 GO5 RD2	QT-R	FI	MC(265) ST(190000)	2002-2005	Yes	Yes
[406]	Wiedemann (2012) *Styring af styringsværktøjer? Om folkeskolelærernes erfaringer med "Fælles mål"*	RR	GO RM	GO2 RM1	QL-IN	HU	SC(9) TE	2006 - 2007	Yes	No
[436]	Andersen et al. (2009) *Quality Assurance and Evaluation in Denmark*	RA	GO RM	GO2 GO5 RM1	QT	FI HU TP PH	SC Document study		Yes	No
[444]	Bogetoft et al (2014) *The efficiency of educational production*	RR	GO	GO5	QT-R	FI	NA(19)	2012-2013	No	Yes

Notes: The list only includes studies with a highly satisfactory, satisfactory or somewhat satisfactory methodological quality according to the scientific norms for the applied research design. Note that some of the studies having (explicit or implicit) causal ambitions provide satisfactory descriptive inferences, though not satisfactory causal inferences.

Type of study: RA = Research articles and literature reviews (peer reviewed); RR = Research reports and books (peer reviewed); NG = National government evaluations and reports; LG = Local government evaluations and reports; CI = Evaluations etc. by consulting firms or interest organisations; OT = Other studies.

OECD Theme: GO = Governance; RD = Resource distribution; RU = Resource utilisation; RM = Resource management

Sub-theme: GO1 = Policy priorities/differences in spending per student across regions or type of municipality; GO2 = Implementation of policies; GO3 = Responsibilities across levels of the school system; GO4 = Sources of revenue; GO5 = Benchmarking of efficiency or effectiveness/best practices.

RD1 = Distribution of resources between administrative levels and resource types; RD2 = Distribution of resources and students to individual schools; RD3 = School structure and distribution of school facilities and materials, e.g. ICT; RD4 = Distribution of teacher resources; RD5 = Distribution of school leadership resources; RD6 = Programmes targeted to specific students, e.g. resource distribution based on socio-economic criteria.

RU1 = Allocation of teacher resources to students; RU2 = Matching resources to individual students' learning needs; RU3 = Organisation of teaching and learning environment; RU4 = Organisation of student learning time; RU5 = Use of school facilities and materials, e.g. ICT

RM1 = Monitoring resource use (audit system etc.); RM2 = Outcome-based planning; rewards, sanctions and other incentives; RM3 = Capacity building for resource management; RM4 = Transparency and reporting on outputs and costs.

Type of resources: FI = Financial; HU = Human; PH=Physical TP= Targeted programs

Data type: QT = Quantitative; QL = Qualitative; S = survey; R = registers; O= Observations; IV = Interviews; TX = Text Analysis.

Unit of Analysis: ST = Students; TE = Teachers; SC = Schools; MU = Municipalities; NA = National level.

3.2 Studies of Policy priorities/differences in spending per student across regions or type of municipality

The studies identified as being relevant within the theme Policy priorities mainly focus on the level of expenses, and how expenses vary over time, according to socio-demography, the type of education offered (normal vs. special needs education), the degree of competition from private schools and municipal politicians' attitudes towards spending and reform in primary and lower secondary education.

Level of Expenditure and variations over time

In 2009, the level of expenditure for primary and lower secondary education in Denmark was 3.1 per cent of GDP compared to the OECD average of 2.5 per cent (Skolens Rejsehold 2010). These figures are the same in 2011 (OECD 2014). The figures should however be interpreted with the reservation that the organisation of the school systems as well as accounting systems varies between countries, so that the expenditures are not fully comparable across countries (OECD 2014). With this reservation in mind, part of the explanation for the higher level of expenditure seems to be that Denmark spent more resources on students in the 1^{st}-6^{th} form compared to most other Western countries (Skolens Rejsehold 2010).

Denmark also has a fairly low ratio of students per teacher, i.e. 13 students per teacher, compared to the OECD average of 15 students per teacher (2007). Furthermore, the ratio has decreased in recent years to 11.2 students per teacher (2011-13) (The Ministry of Education 2015b). In 2007, the Danish teachers were calculated to be engaged in 650 hours of teaching per year on average. The OECD average was approximately 760 hours per year (Skolens Rejsehold 2010). More recently the average hours of teaching per year for teachers in primary education 2012 was calculated to be 659 in Denmark and 782 on average in OECD countries (OECD 2014).

However, this comparison should be interpreted with certain reservations. For instance, the way in which short breaks are included in the calculations may vary between countries, and the number of teaching hours are calculated as the typical teaching time in some countries and as the maximum, the actual or the minimum number of teaching hours in other countries (OECD 2014). In addition, it should be noted that the figures are no longer representative of Denmark, as the Act 409 in 2014 changed the framework for utilisation of the working hours of teachers. Generally, the municipalities have implemented the new framework by increasing the average number of teaching hours per teacher (Astrup Bæk 2014).

Socio-demographic factors are shown to have an impact on the municipal level of school expenditure in Denmark (Houlberg, Østergaard Larsen & Rangvid 2013, Behrens, Lange & Jensen 2010). Though the specific socio-economic factors should not be interpreted as affecting expenses in a deterministic way (COWI 2010), statistically

municipalities with a more disadvantaged socio-economic context spend more funds on education. There is an association between municipal school expenditure and the number of bilingual children, as well as the number of children living in council housing (COWI 2010). In addition, there is a positive association between school expenditure and the number of parents with low levels of education, low-income parents and parents with weak labour market association, children of single parents, and children of young, single mothers. Furthermore, there is an association between children with reduced functionalities on the one hand and municipal expenditure on pedagogical and psychological assistance on the other (COWI 2010).

In line with this, more than half of the expenditure variations between the municipalities can be explained by differences in socio-economic conditions – expressed by the number of students, the share of immigrant students, the educational background and employment status of the parents and/or the share of children in one-parent families (Houlberg, Østergaard Larsen & Rangvid 2013, Behrens, Lange & Jensen 2010).

The average expenditure per Danish student in the period from 2002-2009 was fairly stable (BDO 2010)(Skolens Rejsehold 2010). However, two opposite trends can be identified. On the one hand, educational costs for special needs education increased from 2002 to 2009, and on the other hand educational costs for ordinary teaching declined (BDO 2010). In the period from 2009 to 2013, the total expenditure of teaching in schools decreased from year to year[34] (BDO 2014a). Furthermore, from 2009 to 2011 the expenditures for special needs education in special schools did not increase at the same rate as in the previous years. In the same period, the cost of ordinary education in the Folkeskole decreased. In sum, from 2011 to 2013 the expenditures for special schools declined, along with a continued decrease in expenditures per student for ordinary education (BDO 2014a).

A reservation with regard to the above conclusion is that the data validity on the proportion of spending on special needs education when included in the overall budget for ordinary teaching in the Folkeskole is questionable. There is a risk that the actual cost of special needs education included in ordinary education is hidden in the cost for the Folkeskole in general (BDO 2010). It should be remembered that the conclusion for 2013 is sensitive to the presumed underestimation of expenditures in 2013 due to the lock out of teachers in spring 2013. Overall, the study does not provide any basis for concluding whether the decline in expenditures since 2009 is an expression of a reduced service level and/or a more efficient use of school resources due to, for instance, structural changes towards fewer and larger schools since 2009.

[34] As emphasized in Table 3.1, the expenditures in 2013 are presumably underestimated, due to the lock-out of teachers in spring 2013.

Planning of resource use

In order to forecast the cost of education, it is relevant to link changes in demand, such as number of students attending the Folkeskole and changes in the municipal level of expenditures for the Folkeskole. However, changes in the number of students are not significantly related to the changes in expenditure levels in any of the periods analysed (1996-2006 and 2007-2009) (Dørken & Grønlund Andersen 2010). A reason for this may be that changes may occur with a time lag, but based on the fact that the municipalities claim to use projections of number of students as a planning tool, the result is surprising – also in light of the long period included in the analysis. As a result, the development in school expenditure must be guided by other factors than the number of students. Rather, it may primarily be the number of school classes in which the municipal budget models are anchored, so that the school classes as a unit drives the expenses rather than the number of students (Dørken & Grønlund Andersen 2010). As the national level does not distribute any ear-marked funds for primary and lower secondary education, what the municipal budget models are driven by is of vital importance for the overall cost of basic education in Denmark.

Performance information is found to affect municipal politicians' attitudes to spending and reform (Nielsen & Bækgaard 2015). As the expenditure level is set by the municipal boards within the framework of the Folkeskole Act, the access and utilisation of performance information may be of vital importance for the individual municipality's allocation of resources for the Folkeskole. In a hypothetical situation, Danish local politicians tend to allocate more resources for the Folkeskole both if student performance in the municipality is low and if student performance is high, whereas medium student performance leads to a decrease in allocation of resources (Nielsen & Bækgaard 2015). The conclusion is based on a survey-based randomised control trial study carried out at municipality level with within-municipality randomization, where politicians in the single municipality were randomized in a group being 'treated' with municipality-specific performance information, and a control group of politicians denied this information. When politicians are provided with positive information on the performance of schools and students, the politicians express positive attitudes towards spending and reform in the schooling sector – both with respect to increasing spending and shielding the area from reforms. The hypothetical reform used in the survey is a school merger, which is generally a rather unpopular event. Other reform types might have produced other results with regard to the relationship between performance information and attitudes towards the reform.

Type of Education Offered

In the school year 2008/09, 14.3 per cent of all students attended some sort of special needs education – either integrated with ordinary education or as segregated special needs education (Deloitte 2010). The major part of the ordinary, integrated special needs education is provided to children with reading and writing difficulties. Special

schools predominantly provide education for students with generally reduced learning abilities due to, for instance, physical, social and/or cognitive dis-functionalities. However, the division between inclusion and segregation in relation to special needs education is not fixed and varies across the municipalities (Deloitte 2010). An extrapolation based on 12 municipalities indicates that approximately 19.6 per cent of the total cost of the Folkeskole in each municipality in 2008/2009 was spent on special needs education. Of this, the main share (80 per cent) was allocated to the segregated schools. However, there is large variation across the 12 municipalities (Deloitte 2010).

On average, the extra expenditure for students attending special needs education in an ordinary/inclusive school was estimated to be 34,000 DKK per year in 2008/2009. The extra expenditure for students attending special needs education in a segregated school was estimated to be 84,000 DKK per year. However, the students attending the two different forms of special needs education are typically non-comparable with regard to the level of functionality. Furthermore, it is difficult to compare the expenditure level across the municipalities, as there is a major discrepancy between how and on which accounts the costs of different types of special needs education are recorded in each municipality (Deloitte 2010). In the light of this knowledge, a legislative change was implemented in the Folkeskole Act in 2012, and principles for a reduced exclusion of students were agreed upon between the Government and LGDK.

Competition of private schools

As mentioned in Chapter 2, approximately 15 per cent of Danish students attend privately provided primary and lower secondary education. What is the effect of a private alternative on public school performance and level of expenditure? It can be shown that competition from private schools does not improve student achievement in the Folkeskole when measured according to school-leaving examination marks (Calmar Andersen & Serritzlew 2007). In contrast, more competition from private schools seems to imply higher public school spending. This is the opposite effect of what is normally expected from competition due to private alternatives.

One reason for the higher expenditure level may be that planning and provision of education in the Folkeskole becomes more difficult, when a private alternative exists. Another reason could be that competition for teachers may increase due to private alternatives. A third reason could be that the public schools need to send costly signals to parents, when they face competition. The effect of the signals vis-á-vis performance that does not offset costs could be better buildings, lower class size etc. (Calmar Andersen & Serritzlew 2007).

3.3 Studies of Implementation of policies

The studies identified within the theme of implementation of policies all cover general governing trends such as curriculum, use of evaluation data and transparency, as well as specific regulations, such as integration of students attending special needs education, and also bilingual students and regulation of utilisation of the teachers' working hours.

General governing trends
The Danish Folkeskole is governed by, among other things, a fairly broad curricular frame as stated in the Common Objectives. However, national school policy goals seem only to be implemented and met to a limited degree at school level. For instance, the application of performance management at school level is not widespread (Normann Andersen & Strømbæk Pedersen 2012, Skolens Rejsehold 2010). However, case-studies indicate that there is a general trend towards a more uniform, low-trust model between the state/local authorities and schools on detailed standards for student achievement in some basic subjects and a strict testing and examination system. This has an impact on the way schools are managed (Moos, Krejsler & Kofod 2008).

Successful school leaders challenge these instrumental changes by asserting that they are not sufficient means for meeting the general purpose of the Folkeskole with regard to the all-round development of the individual student, inclusiveness and 'education for all'. The school leaders see the core purpose of the Folkeskole as much broader than merely imparting basic academic skills (Moos, Krejsler & Kofod 2008).

The development and rise of data use in education has allegedly moved the sector towards a situation with increasing 'governance by numbers' (Simola et al. 2011). A good deal of the knowledge circulated as data or data-rich commentary comes from 'official' sources and is produced by government or its agencies – for example data about performance in school-leaving examinations. These data are also used to provide a shared agenda – or definitions of problems – through which networks of different interests are brought together to collectively discuss and interpret the knowledge processed by them. Data is a key resource in the making of policy; at the level of discourse they offer the rationale for action, and in material terms they are being generated in increasing detail, in complex forms and in many different locations (Simola et al. 2011).

The growth in the number and importance of statisticians, economists and other 'analysts' is significant here, as is their configuration in 'terms' of advising on policy developments and implications. In departments and ministries, there is evidence of increased attempts to synthesise and integrate different data; there is an enhanced role for technologies and the management and interrogation of quantitative data. A new relation between governing and data-driven knowledge may be envisioned: expertise

moves beyond the task of policy informing, and becomes policy forming in a more complex form of governing (Simola et al. 2011).

With the Act on Transparency and Openness from 2002, see also Chapters 2.5.3, focus was placed on, for instance, average grades and transition rates to further education as indicators of quality that could be used for governing purposes as well as informing parents about the quality of each school. Raw average grades were published without any concern for socio-economic differences among schools. This strategy was in line with a broad concern for openness and the right to know rather than having a strict focus on accountability or statistical measurement of effects (Normann Andersen & Dahler-Larsen 2008). The official programme theories about publication were multiple and vague, and important end users of the information (schools and parents) never expressed a strong interest in the data. This ambiguity paved the way for a debate on whether these data indicate any aspects of school quality. Resulting from this was a more open public debate on publishing average grades, with participation from numerous perspectives, including those of underprivileged schools. (Normann Andersen & Dahler-Larsen 2008).

Resulting from the publication of the evaluative information was a number of ramifications, such as an increased awareness of evaluative information for the management of schools, a continued debate about the effects of the published evaluative information on the overall definition of the purpose of schools, as well as on the practice of teaching itself, and the introduction of ministerial second-order control mechanisms against potential corruption of the grades as a valid indicator of quality (Normann Andersen & Dahler-Larsen 2008).

Taking the number of reforms and regulations implemented within Danish primary and lower secondary education into account, the question is how teachers perceive the introduction of new governing mechanisms, such as the curricular Common Objectives. Furthermore, the introduction of new regulatory standards may influence the teaching profession (Wiedemann 2012). Teachers have very different perceptions of the curricular standard (Common Objectives) that defines the common objectives and goals for teaching. Research shows that in the experience of one group of teachers they can use common objectives and goals for teaching to enhance their professional identity, due to the professional standards being clarified. Another group of teachers express the view that their autonomy has diminished (Wiedemann 2012). Thus, the introduction of Common Objectives may lead to a de-professionalisation among some teachers, and at the same time a re-professionalisation among other teachers (Wiedemann 2012). It seems that the method of implementation of Common Objectives at the individual school may explain the different viewpoints. Teachers expressing that they have been involved in the implementation process experience a sense of ownership with regard to the use of Common Objectives.

(Normann Andersen, Dahler-Larsen & Pedersen 2009) provide a historical account of quality assurance and evaluation (QAE) in Denmark with a focus on public schools. Denmark was a late starter in large scale QAE, and the hesitation to produce official league tables lasted until an international committee recommended not doing so. (Normann Andersen, Dahler-Larsen & Pedersen 2009) find that a clear tenet of nationalism in the Danish responses to international QAE can be identified, especially in the establishment of national canons. The multiplicity of forms of data in QAE especially at the school level suggests that though indicators (such as average grades) do catch attention they are not the only descriptors of school quality. The media have been instrumental in casting Denmark as a loser in the international 'horse race' of comparative tests. However, the media have also transmitted critiques of the content and methodology of these tests, as well as reports from under-achieving schools.

Although parts of the QAE initiatives do install hard quantitative measures, QAE regimes in Denmark also include a number of contested terms with vague meanings, such as 'publication', 'self-evaluation' and 'quality'. The meanings of these terms are being negotiated and discursively constructed along the way in specific situations in a sort of unfinished way. Not much is known about the influence of QAE on the daily life of teachers and students. While some research shows the decoupling of official goals from the day-to-day reality in class rooms, others warn of the potentially colonising effects. Perhaps the most important functions of QAE initiatives have been to set the agenda, direct attention to what appears to be 'low performance', and create a sense of a need to initiate new mentalities and new policy initiatives. Rather than provide direct and predictable 'steering', QAE perhaps blazes the trail, as it seeks to find its way in a world full of contradiction and tension.

The imposed law in 2013 on new rules for the utilisation of teachers' working hours is an example of a policy change implemented within a high level of conflict, as the law was the offspring of a labour market conflict, see Chapter 2. Hence, the implementation of the Act has attracted massive attention (Astrup Bæk 2014). As mentioned, the law provided the school leader with more discretion regarding the number of lessons that each teacher is required to teach and the utilisation of working hours for individual teachers, subjects and tasks.

Eight out of ten municipalities have made guidelines for the implementation of the law (Astrup Bæk 2014). It seems that the municipalities have generally implemented an increase in the number of lessons taught per teacher. The municipalities which had comparatively high rates of lessons taught per teacher before the Act was introduced continue to have a relative high rate of confrontation hours. The study shows that, according to the municipal finance directors, the change in teachers' working hour regulations has contributed to an increase in the efficiency of the Folkeskole, measured as the number of hours taught by each teacher. As the reform is under implementation,

and as no data on the effects of student performance and student well-being are as yet available, it is still on open question whether the working hour regulative will increase the effectiveness with regard to the intentions specified in the Folkeskole reform of 2014.

Specific regulation

As mentioned in Chapter 2, the national tests were implemented following the introduction of Common Objectives in 2007. With respect to student outcomes, the introduction of the national tests seem to have implied learning effects beyond mere "teaching to the test" effects (Rambøll 2013). In other words, the national tests generally seem to improve the performance of the students. In addition, the national tests seem to have improved schools' evaluation culture (Rambøll 2013). The teachers in various degrees see the adaptive principle governing the test as an asset with respect to deploying and conducting the test. Causal inference on student performance effects of tests in most studies is challenged by the fact that implementation of national standardized tests is often accompanied by other reform elements or changes in policy environment. The effect of the national tests themselves is thus difficult to isolated and estimate. In (Rambøll 2013) two designs are applied in order to achieve exogenous variation in participation in national tests. Firstly, by comparing final exam marks of students pre and post the implementation of national tests (with control for individual socioeconomic background). Secondly, an experimental design is conducted by utilising a temporary softare breakdown during the national tests in one year meaning that a random share of the students did not finish the tests and accordingly had no feedback on the results of the tests. The study is conscious about the weaknesses of the first design and the conclusion that the national tests generally improve the performance of the students primarily rests on the latter and stronger experimental design comparing students having feedback on their test results with students that – by randomisation – did not have such feedback. When concluding the study however focus on the overall positive effects of the national tests and hardly discuss the findings that tests in 4th form apparently does not seem to have an effect. The conclusions regarding evaluation culture at the schools and teacher attitudes towards national tests are based on a much weaker causal design, as it is mainly based on survey- and interviewdata collected post the implementation of the national tests and retrospectively reporting perceived changes (Rambøll 2013).

An agreement reached by the Danish government and LGDK in 2012 led to a change in the economic incentives for the municipalities to include students with special needs education in normal classes (Baviskar et al. 2014). Prior to 2012, special needs education was typically financed by common pools at the municipal level, leaving the schools with an incentive to exclude students as the costs of excluded students would be paid by the common pool. As a result, inclusion of students with special needs edu-

cation included in normal schools in the surveyed municipalities rose from 93.1 per cent in 2010 to 94.9 per cent in 2013 and 95.5 per cent in 2014 (Baviskar et al. 2014).

In almost all cases, municipalities that have chosen to host institutions offering special needs education have changed the segregation by not offering segregated special needs education to the youngest students in segregated schools (Baviskar et al. 2014). In some cases, the municipalities have also replaced students already placed in segregated schools by integrating them into the ordinary Folkeskole. The number of segregated schools has not changed, but the number of classes offering integrated special needs education has declined (Baviskar et al. 2014).

Integration of ethnic minorities is another important policy priority in a Danish context. One concern is what the effects of the schools' systematic work with bilingual students are, when judged against student performance, wellbeing of students and degree of transition in upper secondary education (Andersen et al. 2012). According to the municipal School Directors, between 56 and 63 per cent of the municipalities have formulated policies with reference to additional teaching of Danish as a second language, language stimulation of preschool children and Danish as a second language as a dimension in all subjects based on information from the school year 2010/11. Fewer municipalities state that they have policies with reference to the transition of bilingual students to upper secondary education (~33 per cent). In 2010/11, 13 out of 54 municipalities had policies regarding the distribution of bilingual students across school districts. In 2007/08, only five municipalities had equivalent policies. 15 of 54 municipalities provided mother-tongue teaching in 2010/11.

Most schools offer supplementary mother-tongue teaching outside the class but during normal school hours. This is in opposition to the stated national goals. In municipalities with a large number of bilingual students, a positive association is found between generally stated municipal goals on the inclusion of bilingual students and bilingual student performance. The relationship is not found in municipalities with few bilingual students, even if they have set goals in the area. Specific stated goals with regard to mentor arrangement, homework tutoring and special counselling seem only to work in municipalities with few bilingual students.

No relationship between policies and bilingual students' wellbeing is found in either municipalities with a large or small number of bilingual students (Andersen et al. 2012). Additional teaching in Danish as a second language has a positive effect only if it takes place as an additional activity outside normal teaching hours, so that bilingual students avoid missing some of the ordinary teaching. There is no clear evidence on whether stated policies have any impact on bilingual students' transition to upper secondary education, performance and wellbeing. Firm causal conclusions cannot be drawn, as the study depends on conditional independence (Andersen et al. 2012).

3.4 Studies of Responsibilities across levels of the school system

Studies of responsibilities across levels of schools are relatively few. However, one study investigates whether private schools take a fair share of the social responsibility, compared to public schools (Tornhøj Christensen & Ladenburg 2012). The study addresses how resourceful versus less-resourceful students are distributed across public and private schools in the year 2009/2010. The results indicate that students with a strong socio-economic background more often attend private schools.

However, the private schools constitute a highly heterogeneous group. Some primarily teach students with a disadvantaged social background, while others primarily teach students with a strong social background, this polarisation being most outspoken in the capital area of Copenhagen (Tornhøj Christensen & Ladenburg 2012). Although the private schools and the students in private schools are very heterogeneous, the study indicates that one of the challenges facing the 'Folkeskole' may be that the students in private schools generally have a more advantageous socio economic background compared to the students in the 'Folkeskole' (Tornhøj Christensen & Ladenburg 2012).

3.5 Studies of Sources of revenue

Very few studies are included in the review on the sources of revenue, as the review is limited to public schools. In relation to the theme Governance of resource use, one study is relevant due to its focus on distribution of public funding of private schools (Calmar Andersen 2008b). The focus is on students (or more precisely probably the parents) and their choice between public and private schools, and the effect of school choice on academic performance (Calmar Andersen 2008b). Private schools with a high average socio-economic status perform better than similar public schools. At the same time, private schools with students with low socio-economic status perform poorer than their public counterparts.

The results show no significant average effect of private schooling on school leaving examination scores. However, private schools of high socio-economic status perform better than similar public schools, while private schools of low socio-economic status under-perform – even for individual students with high socio-economic status. This indicates that the institutional setting of a voucher system is not enough to raise educational performance in general, arguably because some parents choose schools on the basis of non-academic criteria (Calmar Andersen 2008b).

3.6 Studies of Benchmarking of efficiency or effectiveness

This subtheme investigates the correlation between spending and performance. The studies in this section address the level of expenses, how expenses vary over time,

across municipalities and school forms, as well as according to socio-demography and performance of students. Some of the studies in this section are studies of effectiveness, others are studies of efficiency.

In the analysis of inter-municipal variations in resource distribution, the point of departure for several studies is the empirical fact that expenditures per student are approximately twice as high in the municipality spending the most compared to the one spending the least (Houlberg, Østergaard Larsen & Rangvid 2013, Behrens, Lange & Jensen 2010)[35]. However, more than half of the variations among municipalities can be explained by differences in socio-economic conditions, expressed by the number of students, the share of immigrant students, the educational background and employment status of the parents and/or the share of children in one-parent families (Houlberg, Østergaard Larsen & Rangvid 2013, Behrens, Lange & Jensen 2010). In addition, more policy-dependent factors, such as the student/teacher ratio and the share of students attaining special needs education, seem to be of importance (Behrens, Lange & Jensen 2010).

A case study of two municipalities with similar socio-economic needs points to some of the potential explanations for higher school expenditure in one of the municipalities compared to the other (Rambøll 2010). Among these explanations are the number of weekly class lessons, inclusion of social educators in the classes, the share of students receiving special needs education, the number of small schools, the share of school-aged children choosing a private school and whether special schools are located within the municipality or not. Also, variations in accounting practices may affect the size of the calculated school expenditures, as intra-municipal differences, for instance, may exist in the precise accounting of administrative school expenditures in school accounts versus in central municipal administrative accounts.

Effectiveness

In line with international findings (Hanushek 1996, Hanushek 2003), a number of studies find that the *level* of school expenditures per student generally has no or virtually no effect on student performance[36] (Houlberg, Østergaard Larsen & Rangvid 2013, Calmar Andersen & Mortensen 2010, Laier Christensen 2009). It should be noted that these studies, along with most other studies analysing the relationship between school expenditures and student performance, hinge on conditional independence in relation to causal inference and generally suffer from potential self-selection bias, especially when the unit of study is the school level. For instance, it is not random in which municipality people reside and which school parents choose for their children.

[35] See Also appendix 1.
[36] Student background controlled for a variety of socio-economic characteristics of the individual students.

Keeping this in mind, (Calmar Andersen & Mortensen 2010)[37] take the analysis a step further and find that *increasing* expenditures over the years in which the student attends school may be beneficial for student performance. More robustly and significantly it is found, however, that *stable* budgets in the years of schooling have a positive effect on student performance at the final exams of the Folkeskole (Calmar Andersen & Mortensen 2010). The design of the study provides no empirical explanations for processes and mechanisms behind the importance of stable budgets, but the study points to a set of theory-based arguments on economic and personnel stability as a precondition for stability in administrative systems, such as structural, mission, technology and procedural stability. Moreover, personnel stability may also require stable budgetary developments that allow personnel planning and adjustments made through natural wastage (Calmar Andersen & Mortensen 2010).

Higher expenses do not imply better outcomes for the students when focusing on the effect of resources spent in the schooling sector on student performance measured as SES-adjusted, school-leaving examination marks calculated over a five-year period from 2002 to 2005 (Laier Christensen 2009). As schooling is a ten-year event, and the expense variables included in this benchmarking study only cover 1-5 years of the school period, which may be the explanation of the insignificance found (Laier Christensen 2009). When including main explanatory variables as gross expenses for schooling per student and expenses for teacher wages per student at the municipality level, along with controls for share of low-educated mothers, share of low-income families, share of unemployed or studying mothers, share of non-western mothers, and real estate prices (square metres), a positive but insignificant association between expenditures and student performance is found (Laier Christensen 2009). The somewhat lacking timing congruence between the outcome and the explanatory variables, as well as conditional independence, is a problem in the study.

When studying the effect of municipal school expenses on student performance measured as school-leaving examination marks, it is found that spending over all years of schooling is a more important determinant of student attainment than spending in the last year of school attendance (Houlberg, Østergaard Larsen & Rangvid 2013). Keeping potential self-selection bias in mind, and the awareness that self-selection bias will tend to bias the estimated association between expenditures and student performance toward zero, (Houlberg, Østergaard Larsen & Rangvid 2013) not only focus on the average effects but also test for potential heterogeneous effects.

A substantially limited but statistically significant positive effect of increased spending is found for municipalities with (need-adjusted) spending levels below the average, i.e. spending up to the average seems to be fruitful, while increased spending above the average does not seem to be beneficial for student performance. When it comes to stu-

[37] Including a robustness test that – given the data available – seeks to control for self-selection bias at municipal level.

dent background, the spending level seems to be statistically beneficial for weak students but not for students with a more advantageous socio-economic background (Houlberg, Østergaard Larsen & Rangvid 2013). Despite the satisfying amounts of data included in the analysis, the study hinges on conditional independence. This is not a satisfactory design for establishing causality and does not provide a sound basis for calculations of potentials.

Effects on 9th form school-leaving examination marks of "structural conditions" relating to teacher characteristics, class and school size are studied in order to assess whether high performance can be achieved by cost-neutral change in policies (Teglgaard Jakobsen et al. 2012). Effects of "structural conditions" are measured as teachers' sickness absence, teachers' teaching share, school size, class size, students per teacher, teaching hours per week, teaching hours per student and the student composition at the school (Teglgaard Jakobsen et al. 2012). Only teachers' sickness absence, teachers' teaching share, class size and the student composition are significant. The outcome variable of the study is (probably) school-averaged predicted exam marks. The predictions come from a model with exam marks as dependent variable and traditional socio-esocio-economicconomic variables as explanatory variables. The study hinges on conditional independence and is methodologically weak with regard to documentation of the outcome variable. (Teglgaard Jakobsen et al. 2012).

Efficiency

By comparing municipalities' service level and productivity, it is possible to calculate an index of municipalities' service output and to identify efficiency (or productivity) potentials taking differences in expenditure levels into account (Wittrup et al. 2013). Differences between municipalities are partly due to differences in policies across municipalities. Focusing on the results for the Folkeskole, a 'productivity potential' across municipalities of 5.4 billion DKK is estimated with great uncertainty (Wittrup et al. 2013), equalling nearly 10 per cent of the expenditures of the Folkeskole. The estimations are however highly sensitive to variations in the municipalities' practices for accounting costs and registering the services delivered.

For the individual municipalities the productivity scores range from 1 to 0.8 and are estimated on basis of a Data Envelopment Analysis (DEA) model with 'benefit-of-the-doubt' weighing of 9 indicators for school service, including the teacher-student ratio, the number of teaching lessons per week and SES-adjusted school-leaving examination marks. Only few municipalities score a 1, and hence most municipalities could increase productivity without changing their service level. A score of for instance 0.9 implies that the municipality could deliver the same service level using only 90per cent of the current resources. The idea of comparing service levels on output/outcomes instead of expenses and hence taking into account differences in productivity is very fruitful.

The approach does however have some shortcomings, as only service levels in areas with measureable output/outcome are considered. Hence, if municipalities prioritise delivering high service in other areas they are ranked relatively low. The practical policy usefulness of the productivity analysis is somewhat questionable, as the results are highly sensitive to model specification and accounting practices (Wittrup et al. 2013). The saving potentials require causality between input and expenses. This has not been established by the study and cannot be assumed. In addition, it is questionable whether municipalities are able to mimic other municipalities perfectly to realize the saving potentials (Wittrup et al. 2013).

While the study above was carried out at the municipal level, another benchmark study based on the DEA method focuses on school level and asks whether schools can deliver the same level of output with lower levels of input (or deliver a higher output with the same inputs). This study uses the concept of a production frontier and matches each school that is not on the frontier with a convex combination of schools on the frontier (Wittrup & Bogetoft 2011).

Schools are only compared if the following two conditions are met. Firstly, output must be significantly higher in the frontier school(s), and secondly the schools must be comparable with regard to the stock of students. On average, each school is compared with five other schools. Public schools are only compared with other public schools. Around one fifth of all schools are estimated to be on the frontier (Wittrup & Bogetoft 2011). Keeping output fixed, the study finds a saving potential of 13 per cent if all schools use resources as their DEA suggested best match(es). The savings potential does not cover total costs but only costs on man-years or wages. If schools are only compared to schools within the same municipality, the saving potential is reduced to 0.6 per cent.

The study concludes by investigating potential strategies to improve efficiency. Specifically, the authors look into school size and the share of time allocated to teaching. Based on the model used in research question one, the study finds that, on average, one third of the savings potential can be achieved by changing school size. Bearing in mind that other studies find no significant relation between school size and student performance ((Skolens Rejsehold 2010, Calmar Andersen & Winter 2011), according to (Wittrup & Bogetoft 2011) around 60 per cent of the schools are considered too small, and an optimum school is suggested to have around 500-600 students. Based on the model used in research question two, (Wittrup & Bogetoft 2011) find that around one fifth of the potential output increase can be realised by reallocation resources. Here, the model suggests that more schools could benefit from spending more time on teaching.

Findings from the study mentioned above are reported in (Bogetoft & Wittrup 2011), which discusses the scope for reducing inefficiency. Here, the study finds that 28 per cent of the variance is explained by socio-economic factors. For the remaining vari-

ance, 93 per cent is explained by student characteristics (abilities) while 7 per cent is explained by school factors. The variance explained by school factors is significant. (Bogetoft & Wittrup 2011). The next step in the analyses is to link the school impact on student performance to resource usage. This is done using the DEA approach. One third of the schools are found to be fully efficient, while the overall potential for efficiency improvement is 13 per cent. Varying the restrictions produces estimates ranging from 9 to 20 per cent. Allowing schools only to be compared to other schools in the municipality reduces the estimate to 1 per cent. (Bogetoft & Wittrup 2011). According to the estimates, the potentials can be reached by changing school size and having teachers spending more of their time on teaching. (Bogetoft & Wittrup 2011). The study provides no evidence of causal relationships between input and output.

The Danish Guidance Reform (DGR) was implemented in 2004 with regard to enrolment into youth education, i.e. upper secondary and vocational education. An evaluation of the reform finds the reform to be cost-neutral and to increase admission to youth education significantly for immigrants, whereas the improvements for native students are insignificant or at best small (Hoest, Jensen & Nielsen 2013). The study is based on a difference-in-difference design with public schools as the treatment group and private schools as the control group. The unit of analysis is students and the data base registry data from the years 2002-2007. The study focuses separately on native students and immigrant students (first and second generation). The outcome used is enrolment into upper secondary education in the same calendar year as lower secondary education is completed. In total, the DGR is found to give significant improvements in enrolment for immigrants and inconclusive estimates for natives (Hoest, Jensen & Nielsen 2013). The main weakness of the study is that outcome is measured as *enrolment* into youth education. As some students drop out of upper secondary and vocational education, a better outcome indicator would be the *completion* of upper secondary and vocational education.

A question raised is whether specific types of private schools are more effective than public schools (Rangvid 2008). Private grammar schools and catholic schools obtain better results compared to public schools, when controlling for individual and peer characteristics. These schools are associated with an advantage of 0.15 (grammar) and 0.19 (catholic) years of subsequent education. In contrast, four private school types are negatively associated with years of education: private and continuation schools are both associated with a disadvantage of about 0.30 years, while small private school and Waldorf school students attain 0.85 and 0.79 fewer years of schooling than public-school students, respectively (Rangvid 2008).

The study conjectures that, due to the lack of formal mechanisms for disseminating information about schools' methods, programmes or academic results that have prevailed in Denmark during the period in which these students attended school, ineffectiveness might have gone unnoticed for many years. On the other hand, the study

acknowledges the possibility that the observed private school effects may partly or entirely be explained by selection bias. Parents who choose grammar or catholic schools may have higher (unobserved) engagement in their children's schooling. On the other hand, continuation schools and Waldorf schools may attract more students with learning disabilities (Rangvid 2008). Since the study targets students who attended school more than 20 years ago, this in itself questions the generalizability of the results in the relation to a modern agenda. The private school sector has changed (and expanded) considerably since then (Rangvid 2008).

3.7 Summary and synthesis of knowledge regarding governance of resource use in schools

The studies identified as being relevant to the policy priorities mainly focus on the level of expenses, and how expenses vary over time according to socio-demography, the type of education offered (normal vs. special needs education) and the degree of competition from private schools. Due to the bottom-up method of the literature review, these studies do not provide a full picture of what the central policy initiatives are, but they does provide a picture of the policy initiatives which have been subject to systematic analysis.

The level of expenditure of Danish primary and lower secondary education in the latest OECD figures (2011) is calculated to be above the average OECD level. In particular, there seems to a higher expenditure level in the 1^{st} – 6^{th} form. As reported by the OECD, the teacher-student ratio in Denmark is low compared to the average OECD level. From 2010 to 2013, both the total expenditures for the Folkeskole and the spending per student have been declining, thus indicating increased school resource efficiency. Changes in the number of students are not significantly related to changes in expenditure level for any of the periods analysed, making it challenging to forecast the expenditure level across municipalities. The school classes may be the unit that drives the expenses rather than the number of students, due to school classes being the unit that municipal budgets are anchored in. Average spending has been stable for most of the 00s. However, in recent years there has been a decline in the expenditures for primary and lower secondary education.

One result which is very clear and well researched is the importance of socio-economic status (SES) for expenses as well as performance of schools. Socio-economic factors are shown to have an impact on the municipal level of school expenditure in Denmark. More than half of the expenditure variations between the municipalities can be explained by differences in socio-economic conditions. When controlled for SES, spending over all years of schooling is a more important determinant of student performance than spending in the last year of school attendance. In line with

this, stable budgets are found to be beneficial for student performance, whereas the level of resources or growth in resources is less or not important.

14.3 per cent of students in 2008/2009 were estimated to attend special needs education, and 19.6 per cent of the total budget was estimated to be spent on special needs education. In 2012, a national aim to include 96 per cent of the students with special needs education in normal classes was agreed upon and accompanied by a legal change in the Folkeskole and a change in the economic incentives for the municipalities to include students. Since 2012, there has been a tendency towards further integration of students in need of special education in ordinary schools rather than segregated schools.

The new Act on regulation of the framework for utilisation of teachers' working hours has been implemented, even if it has been done in a conflict-ridden atmosphere. Studies show that new regulations can lead to a re-professionalisation as well as a de-professionalisation of teachers. An important point in this respect is whether the teachers feel that they are involved in the implementation process. Thus, it may be important to consider how steering, motivation and professionalisation interact, when new policies are implemented.

The studies of benchmarking show interesting variations across the municipalities and indicate a potential for improved efficiency and effectiveness of school resources. However, the problem with this type of analysis is that they often draw causal conclusions and conclusions regarding the potential for savings, even though their findings primarily justify conclusion based on descriptive comparisons of differences in spending levels. As such, due to their inherent nature the benchmarking studies provide no causal knowledge and thus no guidelines on *how* the model-estimated potentials could eventually be realised.

The development and rise of data use in education over the last decade has allegedly moved the sector towards a situation with increasing 'governance by numbers'. This trend is being reinforced by the Folkeskole reform, which is currently being implemented, as the reform places a stronger focus on national performance measures and gives more financial and managerial autonomy to school leaders. Performance-based management has traditionally not been particularly widespread at school level in Denmark, and school leaders see the purpose of the Folkeskole as much broader than performance relating to academic skills of the students. However, performance-based management and use of evaluation data are increasingly being emphasized as relevant management instruments by school leaders. At municipal level, a study indicates that Danish local politicians reward both high and low student performance by allocating more resources to the Folkeskole, whereas medium performance of the students tend to lead to a decrease in allocation of resources.

4 Resource distribution

As the Folkeskole is the focus of this report and the full financial and organizational responsibility for the Folkeskole lies with the municipalities, the theme Resource distribution mainly focuses on the municipal level. The Danish municipalities have a large degree of fiscal autonomy to decide the level and distribution of resources of the Folkeskole within the framework of the national legislation and goals.

Within the legal framework of the Folkeskole Act, the municipalities have autonomy not just to allocate and organise resources for the Folkeskole, but also with regard to deciding which specific budget models to use for allocating resources to the Folkeskole at large and the specific allocation of resources to the individual schools, types of resources and purposes. For instance, the municipalities decide:

- The total budget for the Folkeskole and how (part of) this is distributed to individual schools.
- The school structure, i.e. the number and size of schools, and the number of and size of classes (as long as the minimum number of lessons for each form level is met, and the size of the classes does not exceed 28 students).
- The level of detail for the municipal council to approve the budget, which in principle spans from granting one total budget for the entire Folkeskole area to the granting of more detailed and specific budgets for purposes such as special needs education, pedagogical advisers, competency development of teachers and school leaders, instructors for bilingual students, ICT and cleaning and maintenance of school buildings.
- Which parts of the budget are allocated to common pools at municipal level, and which parts are distributed to the individual schools. The schools' fiscal autonomy to reallocate resources between type of resources, tasks and years. For instance, are the individual schools allowed to – and under which conditions and within which limits – transfer budgets between wages and other current expenditures and/or transfer budgets from one budget year to another.

Accordingly, a comprehensive picture of the resulting diversity in the Danish municipal school system is difficult to establish. The municipalities budget and account their expenditures according to a uniform system specified by the central government[38] and controlled by independent auditors. With the reservation of inter-municipal differences in accounting practices[39], and time-related changes in tasks, this uniform accounting

[38] http://budregn.oim.dk/budget-og-regnskabssystem-for-kommuner.aspx. The most important accounts for school-aged children are: Public schools/Folkeskoler (account 3.22.01), Joint municipal costs for the school system (3.22.02), Home education (3.22.03), Special guidance (3.22.04), After school care (3.22.05), School busses (3.22.06), Special needs education in regions (3.22.07), Municipal special schools (3.22.08), Payment to private schools (3.22.10), Youth educational guidance (3.22.14) and Sport facilities for children and young people (3.22.18)

[39] Differences may exist in, for instance, the degree to which costs for administrative personnel, ICT, auditing and maintenance of buildings are taken fromin accounts of the Folkeskole or central administrative accounts

system makes it possible to calculate and compare the total expenditures for the Folkeskole at large across municipalities and years. As described in Chapter 2, both the total expenditures for the Folkeskole and the expenditures per student have been declining since 2009.

However, due to the municipal autonomy mentioned above and the accompanying diversity in principles for allocating resources to various resource types, the municipal budgets and accounts provide no valid data basis for comparing the costs of specific resource types across municipalities or years. Budgets for ICT, buildings, school materials, special needs education or special resource persons aimed at handling the challenges of students with a disadvantaged social background may be more or less included in lump budgets decentralised to the individual schools.

The payments of salaries for all municipal employees are registered in a common municipal data office called KRL. Accordingly, the trend in the salaries of and the number of teachers as well as school leaders can be calculated.

Table 4.1 shows the development in the number of teachers and the number of school leaders from 2008 to 2014. In the six year period from 2008 to 2014, the number of teachers was reduced by 11 per cent. The trend is the same whether or not pedagogical leaders of pre-school classes are included. In comparison, the number of students dropped by 4 per cent in the same period (see Table 2.3), meaning that the student/teacher ratio has been increasing since 2008.

In the period from 2008 to 2014, also the number of school leaders declined by 11 per cent, indicating that school leaders on average managed a larger number of students in 2014 than in 2008. This development should be interpreted in light of a simultaneous reduction in the number of schools (see Table 5.1).

Table 4.1 The number of teachers and school leaders 2008-2014, full year equivalents

	2008	2009	2010	2011	2012	2013*	2014
Teachers	52,265	52,728	51,572	48,841	46,870	44,035	46,498
Teachers, including pedagogical leaders of pre-school classes	55,527	55,965	54,791	51,903	49,805	46,754	49,390
Teachers, including pedagogical leaders of pre-school classes and substitutes	56,766	57,258	55,953	52,915	50,771	47,717	50,743
School leaders, vice managers and mid-level managers	3,676	3,895	3,787	3,603	3,423	3,344	3,262

Note: Full year equivalents. *: Due to a lock-out of teachers in 2013, the 2013 figures are underestimated

Source: The common data office for employees in municipalities and regions (KRL). www.krl.dk

The majority, more precisely 71 per cent of the teachers in the Folkeskole are women (Table 4.2). One third of the teachers are aged 51 years or older, while 38 per cent are 40 years old or younger.

Table 4.2 Age and gender composition of the teaching body, 1st March 2015

Age	Women	Men	Total	Percentage
21-30	3,436	1,175	4,611	8.5
31-40	11,476	4,464	15,940	29.4
41-50	11,577	4,137	15,714	29.0
51-60	9,591	4,085	13,676	25.2
61-70	2,545	1,689	4,234	7.8
Total	38,625	15,550	54,175	100.0
Percentage	71.3	28.7	100.0	

Note: Figures based on the membership database of the Union of Danish teachers. The Union is organising close to 100 per cent of the teachers in the Danish Folkeskole. The unit is the number of teachers. Unemployed teachers, teachers on sabbatical leave and a few teachers in private schools are included. Teachers Retired teachers, students and special members are not included.

Source: http://www.dlf.org/media/6236309/aktive-medlemmer-af-dlf-fordelt-paa-fraktion-aldersintervaller-og-koen.pdf

For a description of appraisal and recruitment of teachers, see Section 2.5 in Chapter 2.

The rest of this chapter is based on the reviewed studies. The following sub-themes guide and structure the presentation:

- Distribution of resources across administrative levels and resource types
- Distribution of resources and students to individual schools
- School structure and distribution of school facilities and materials, e.g. ICT
- Distribution of teacher resources
- Distribution of school leadership resources
- Targeted programs to specific students, e.g. resource distribution based on socio-economic criteria.

4.1 Overview of studies

For a description of the information presented in the table below, see Chapter 3.1.

Table 4.3 Key information about the reviewed studies, Studies of Resource Distribution

Ref. Id	Author(s) and publication year	Type of study	OECD Theme	Subtheme	Data type	Type of resources	Unit of analysis (N)	Data year	Study of Policy Initiatives?	Causal ambition?
[3]	Thorgaard, Peter & Munk Quist Andersen (2010) *Hønen eller ægget? Bureaukrati og performance i den danske folkeskole*	RA	RD	RD5	QT	FI HU	MU (247)	2002-2006	No	Yes
[7]	Præstgaard Christensen et al. (2014) *Effekten af it-støtte på elevers læsefærdigheder*	RR	RD RU	RD3 RU5	QT-R-S	PH	ST (490)	2010-2011	Yes	Yes
[8]	Andersen et al. (2011) *Skolernes samarbejde*	NG	RD	RD1	QT-S	HU	SC(1007)	2010	No	No
[13]	Meier et al. (2015) *Taking Managerial Context Seriously*	RA	RD RM	RD5 RM2	QT-S	HU	SC(670)	2011	Yes	Yes
[15]	Calmar Andersen & Thomsen (2011) *Policy Implications of Limiting Immigrant Concentration in Danish Public Schools*	RA	RD	RD2	QT-R	HU	ST(>40000)	2005	No	Yes
[179]	Houlberg et al. (2013) *Benchmarking og effektivitetsanalyse på folkeskoleområdet*	RR	GO RD	GO1 GO5 RD6	QT-R	FI	MU(98) ST(135349)	2008-2010	Yes	Yes
[203]	KL et al. (2010) *Specialundervisning i folkeskolen*	NG	RD RU	RD1 RU2	QT-R-S-IN	HU TP	MU (12) SC (295)	2008-2009	No	No
[212]	Astrup Bæk & Teglgaard Jakobsen (2014) *Socioøkonomisk ressourcetildelingsmodel for specialundervisningsområdet for Lolland Kommune*	RR	RD	RD6	QT-R	FI TP	ST(600000)	2012-2013	No	Yes
[215]	Feilberg & Hovgaard Mathiasen (2012) *Kommunernes skolestruktur*	RR	RD	RD3	QT-R	PH	MC(94-98)	2004-2012	Yes	Yes
[216]	BDO Consulting, (2014) *Udgifter til ledelse og administration i den danske folkeskole*	CI	RD	RD1 RD5	QT-R	HU	MC(7-98)	2013	No	No
[221]	Nørgaard et al. (2013) *Den automatiserede budgetlægning*	RR	RD	RD1	QT-QL-S	FI	MC(80)	2012-2013	No	No
[223]	Teglgaard Jakobsen(2012) *Fordeling af midler til specialundervisning*	RR	RD	RD6	QT-R	FI TP	ST(600000)	2010-2011	No	Yes
[226]	Søndergaard Pedersen, H. & Teglgaard Jakobsen, S. (2012) *Kommunernes organisering og styring på specialundervisningsområdet*	NG	RD RU	RD1 RD6 RU2	QT-S	FI TP	MC(70)	2011	No	No
[241-242]	KL (2009) *Fundament for fremtiden*	CI	RD	RD3	QT-S-R	PH	MC(86)	2009	No	No
[247]	Rangvid, B. (2007) *Sources of Immigrants' Underachievement*	RR	RD	RD6	QT-R-S	HU	ST(2303)	2000	No	No
[248]	Rangvid, B. (2010) *School Choice, Universal Vouchers and Native Flight from Local Schools*	RA	RD	RD2 RD6	QT-R	FI HU	ST(35000)	2003	Yes	Yes
[254]	Danmarks Evalueringsinstitut, (2014) *TALIS 2013. OECD's lærer- og lederundersøgelse*	NG	RD RU RM	RD4 RD5 RU3 RM2 RM3	QT-S	HU	TE(164-183)	2013	No	No
[270]	Andersen et al. (2012) *Indsatser for tosprogede elever*	RR	GO RD	GO2 RD6	QT-R-S	TP	MC(54) ST(55876) TE (154-303)	2010-2011	Yes	Yes

[279]	BDO (2010) (a minor part has been updated with data from 2013) *Opgørelse af udviklingen i udgifterne til undervisning i folkeskolen pr. elev*	CI	GO RD	GO1 RD6	QT-R	FI	MC(98-270)	2002-2009(2013)	No	No
[281]	Skolens rejsehold (2010) *Baggrundsrapport til Fremtidens folkeskole*	NG	GO RD RM	GO1 GO2 GO5 RD2 RM1 RM3	QT-QL-S-R-IN	FI HU TP	NA MC (3) SC (37)	2010	No	No
[283]	Deloitte (2010) *Analyse af specialundervisning i folkeskolen*	CI	GO RD RM	GO1 GO5 RD1 RM1 RM2	QT-QL-S-R	FI TP	MC(12)	2008-2009	No	Yes
[286]	Gentofte Kommune et al. (2008) *Ressourcestyring i folkeskolen*	LG	RD	RD1 RD2	QT-QL	FI	MC(6)	2006-2007	No	No
[288]	Rambøll (2010) *Udgifter til folkeskolen. Analyse af to kommuner*	CI	GO RD RU	GO5 RD3 RD6 RU1 RU4	QT-QL-R	FI HU PH TP	MC(2)	2008-2010	No	No
[289]	Københavns Kommune (2014) *Bevillingsvejledning for almene folkeskoler 2014*	LG	RD	RD2		FI	Resource allocation model Cph		No	No
[293]	Pedersen et al. (2011) *Ledelse af folkeskolerne. Vilkår og former for skoleledelse*	RR	RD RM	RD5 RM2 RM3	QL-IN-O-QT	HU	SC(6)	2010-2011	No	Yes
[296]	EVA (2009) *Særlige ressourcepersoner i folkeskolen*	NG	RD RU	RD4 RU2	QT-QL-S	HU	SC(597) SC (8) MC(8)	2009	No	No
[319]	Astrup Bæk (2014) *Kommunernes økonomiske implementering af folkeskolereformen*	RR	GO RU	GO2 RU4	QT-S	FI HU TP	MC(75)	2014	Yes	No
[320]	Tornhøj Christensen & Ladenburg (2012) *Privatskolerne og det sociale ansvar*	RR	GO RD	GO3 RD4	QT-R	HU	SC (2009) ST(660000)	2009-2010	No	No
[330]	Rambøll (2011) *Evaluering af undervisningsassistentordningen*	CI	RD RU	RD4 RU1 RU2	QT-R-S-QL	HU TP	MC(22-28) SC(55-71) ST(553-610)	2009-2011	No	Yes
[341]	Bækgaard (2010) *Skolelukninger i Kommunalreformens skygge?*	RA	RD	RD3	QT	PH	SC(1585)	2005-2009	Yes	Yes
[350]	Egelund, (2009). *TALIS. Lærere og skoleledere om undervisning, kompetenceudvikling og evaluering(..)*	NG	RD RU	RD4 RD5 RU3	QT-S	HU	SC(115) TE(1717)	2008	No	No
[362]	Moos et al. (2013) *Successful Nordic school leadership*	RR	RD RM	RD5 RM3 RM4	QL-O	HU	Text analysis SC(6 in each country) NA(3)	2003-2009	No	No
[375]	Teknologisk Institut (2008) *Skoler i landdistrikter*	RR	RD	RD3	QT-QL-S-R	PH	MC(6) SC(2009)	1990-2007	Yes	Yes
[376]	Svendsen, G. L. H. (2013) *Skolelukninger på landet*	RR	RD	RD3	QT-R	PH	MC(98-270)	1993 - 2012	Yes	Yes
[379]	Baviskar et al. (2014) *Kommunernes omstilling til øget inklusion pr. marts 2014*	LG	GO RD RU RM	GO2 RD1 RD6 RU2 RM3	QT-R-S-QL-IN	FI HU TP	MC(12) SC(68)	2010-2014	Yes	No
[380]	Calmar Andersen et al. (2014) *Indledende analyser af forsøg med modersmålsbaseret undervisning*	RR	RD RU	RD6 RU1	QT-R-S	HU TP	SC(120) ST(2608)	2013-2014	Yes	Yes
[381]	Rambøll (2014) *Erfaringsopsamling om implementering af klasseindsatser. Forsøg om modersmålsbaseret undervisning*	CI	RD RU	RD6 RU2	QT	TP	SC(10)	2013	No	No

[386]	Brøndum & Fliess (2010) *Evaluering af model for henvisning af skolebegyndere med dansk som andetsprog*	CI	RD	RD2	QT-S-QL-IN	HU	MC(1) SC(8) ST(537)	2009-2010	No	No
[392]	Calmar Andersen, & Bjerre Mortensen (2010) *Policy Stability and Organizational Performance*	RA	GO RD	GO5 RD2	QT-R	FI	MC(270) ST(140000)	2002-2005	No	Yes
[393]	Rambøll (2013) *Evaluering af de nationale test i folkeskolen*	CI	GO RD	GO2 RD6	QT-R-S	TP	ST(>130000) SC(728)	2012-2013	Yes	Yes
[403]	Laier Christensen (2009) *Sammenhængen mellem kommunernes udgifter til skoledrift og skolens undervisningsresultater*	CI	GO RD	GO1 GO5 RD2	QT-R	FI	MC(265) ST(190000)	2002-2005	Yes	Yes
[413]	KL (2012) *Rapport om KL's strategiprojekt om effektiv anvendelse af lærernes arbejdstid*	CI	RU	RU1	QT	HU	MC(35) SC(450) TE(148000)	2011-2012	No	No
[414]	KL (2014) *Inklusion/ segregering og tilvalg af folkeskolen*	CI	RD RU	RD2 RU1	QT-R	FI HU	MC (98)	2007-2013	Yes	Yes
[420]	Arendt & Kiil (2013) *Socioøkonomisk budgettildelingsmodel for specialundervisning i folkeskolen i Kerteminde Kommune*	RR	RD	RD6	QT-R	FI TP	ST(3300)	2011-2013	No	Yes
[465]	Hvidman & Calmar Andersen (2014) *Impact of Performance Management in Public and Private Organisations*	RA	RD RM	RD5 RM2	QT-R-S	HU	ST(17200) SC(680)	2013	Yes	Yes
[469]	Kristoffersen et al. (2015) *Disruptive School Peers and Student Outcomes*	RA	RD	RD2	QT-R	HU	ST(286000)	2010-2013	No	Yes
[488]	Kofoed et al. (2010) *Med spredning som muligt svar*	RR	RD	RD2	QT-QL-IV	HU	ST(13-501)	2007-2009	Yes	No

Notes: The list only includes studies with a highly satisfactory, satisfactory or somewhat satisfactory methodological quality, according to the scientific norms for the applied research design. Note that some of the studies with (explicit or implicit) causal ambitions provide satisfactory descriptive inferences, though not satisfactory causal inferences.

Type of study: RA = Research articles and literature reviews (peer-reviewed); RR = Research reports and books (peer-reviewed); NG = National government evaluations and reports; LG = Local government evaluations and reports; CI = Evaluations etc. by consulting firms or interest organizations; OT = Other studies.

OECD Theme: GO = Governance; RD = Resource distribution; RU = Resource utilisation; RM = Resource management.

Sub theme: GO1 = Policy priorities/differences in spending per student across regions or type of municipality; GO2 = Implementation of policies; GO3 = Responsibilities across levels of the school system; GO4 = Sources of revenue; GO5 = Benchmarking of efficiency or effectiveness/ best practices.

RD1 = Distribution of resources between administrative levels and resource types; RD2 = Distribution of resources and students to individual schools; RD3 = School structure and distribution of school facilities and materials, e.g. ICT; RD4 = Distribution of teacher resources; RD5 = Distribution of school leadership resources; RD6 = Programmes targeted to specific students, e.g. resource distribution based on socio-economic criteria.

RU1 = Allocation of teacher resources to students; RU2 = Matching resources to individual students' learning needs; RU3 = Organisation of teaching and learning environment; RU4 = Organisation of student learning time; RU5 = Use of school facilities and materials, e.g. ICT

RM1 = Monitoring resource use (audit system etc.); RM2 = Outcome-based planning; rewards, sanctions and other incentives; RM3 = Capacity building for resource management; RM4 = Transparency and reporting on outputs and costs.

Type of resources: FI = Financial; HU = Human; PH=Physical TP= Targeted programs

Data type: QT = Quantitative; QL = Qualitative; S = survey; R = registers; O= Observations; IV = Interviews; TX = Text Analysis.

Unit of Analysis: ST = Students; TE = Teachers; SC = Schools; MU = Municipalities; NA = National level

4.2 Studies of Distribution of resources across administrative levels and resource types

Due to the fiscal autonomy of the Danish municipalities, it is difficult to provide a comprehensive picture of the resulting diversity in models for allocation and distribu-

tion of school resources. No studies have been found that aim at creating such a comprehensive picture. A number of the studies contribute with partial knowledge on the use of demographic budgeting and – on a case basis – some of the practical budget models utilised to allocate resources.

In Denmark, no national data platform exists for a valid calculation of the distribution of financial resources between the municipal level and the school level. This is due to a combination of limitations in the accounting system and inter-municipal variations in the organisation of the Folkeskole and in accounting practices (Houlberg, Rangvid & Østergaard Larsen 2013). Resources for special education and psychological advising of students, for instance, may be more or less a common pool at municipal level or to varying degrees be decentralized to the individual schools.[40] As the specific costs are not always identifiable, or to varying degrees pooled with costs of normal education, the exact divide between municipal level and school level resources is not consistently identifiable across municipalities.

No studies overcoming these data challenges have been found in the making of this review. Specifically, with regard to the *administrative* costs of the Folkeskole a study estimates – with great uncertainty – that 81 per cent of the administrative costs are situated at school level and 19 per cent at municipal level (BDO 2014b).

Focusing on each municipality's entire budget for the Folkeskole area in the municipality, 95 per cent of the Danish municipalities use demographic changes (demographic budgeting) in the determination of allocation of resources to the Folkeskole area. (Nørgaard, Panduro & Hartwell Christensen 2013). In other words, the total budget for the Folkeskole will rise and fall according to the development in the number of students to some extent. Demographic budgeting is especially used when determining the budgets for normal education, whereas demography-dependent budgets are used to a lesser extent for special education conducted in the ordinary public schools (67 per cent of the municipalities) and segregated special schools (45 per cent) (Nørgaard, Panduro & Hartwell Christensen 2013).

Approximately 40 per cent of the municipalities using demographic budgeting present the demographic budget elements to the municipal council as an explicit budget proposal alongside other budget proposals (e.g. budget cuts or new initiatives). Another approximately 40 per cent of the municipalities administratively adopt the demographic elements without making an explicit budget proposal to the municipal council. The council then approves the overall budget. A few municipalities use different approaches in case of the demographic budget increasing or decreasing. For the vast majority of the municipalities, 75-100 per cent of the budget changes calculated via the demographic budgeting models are included in the final politically determined budgets allo-

[40] See also (Søndergaard Pedersen & Teglgaard Jakobsen 2012) and (Deloitte 2010).

cated for the relevant sector. As no systematic knowledge exists on the municipal models for allocating resources to the Folkeskole, it is unknown whether the allocation of resources is result based, and to what extent performance data play an active role in the allocation of resources for the Folkeskole.

A survey experiment indicates that in a hypothetical situation Danish local politicians tend to allocate more resources for the Folkeskole both if student performance in the municipality is low and high (Nielsen & Bækgaard 2015), whereas medium performance of the students leads to a decrease in allocation of resources to the Folkeskole. The political disposition for allocating resources in both a high and in a low performance context may be an expression of a political quest for avoiding blame in the case of low performance and a quest of credit claiming in the case of high performance (Nielsen & Bækgaard 2015). However, as mentioned above no systematic data are available regarding the actual empirical use of performance information in the allocation of resources for the Folkeskole.

Special needs educations

In addition to their long-standing responsibility for normal education in the Folkeskole, since the structural reform in 2007 the municipalities have also been granted the full financial and professional responsibility for special needs education at primary and lower secondary level. A number of studies have focused on the organizational and financial consequences of the new construction and paid special attention to special needs education. The first years following the 2007 reform saw an increased growth in expenditures for special needs education (KL 2010).

In light of this development, a legislative change was implemented in the Folkeskole Act in 2012 and the Government and LGDK agreed on principles for a reduced exclusion of students to special needs education (Baviskar et al. 2014). Before these changes are detailed, the pre-2012 situation will be briefly described below, according to studies conducted prior to the 2012-changes. Based on studies in 12 municipalities, the results of which were extrapolated to the national level, it was estimated – with great uncertainty –that the gross expenditure for special education in 2008/2009 amounted to 9.7 billion DKK, equalling approximately ¼ of the total expenditures for the Folkeskole (Deloitte 2010, KL 2010). The unit costs for students in special classes and special schools were estimated to be 185,000 DKK and 233,000 DKK higher, respectively, than for 'ordinary' students.

The design did not allow causal inferences, but on a descriptive basis the study pointed to some indicative and potential explanations for the large and growing expenditures for special education.For instance that the centralised budget models provided the schools with no incentives for inclusion, that the visitation committees had no financial responsibility and the existence of a supply-induced tendency to fill up the special education facilities at hand (KL 2010). The potential importance of the municipalities'

organisation and governance of resources for special needs education are also verbalized by (Søndergaard Pedersen & Teglgaard Jakobsen 2012), who also touched upon the incentives at municipal and school level for enrolling students with special education needs in ordinary education

According to a municipal school director survey in 2011, 85 per cent of the municipalities had a permanent visitation committee with competencies to decide the type of special needs education that a student having learning difficulties was to attend. The financial responsibility for ordinary special needs education included in normal classes (less than 9 hours/week) and single-integrated special needs education (more than 9 hours/week) was decentralised to the individual schools. This was the case for 87 per cent of the municipalities and 28 per cent of the municipalities, respectively. Regarding segregated special needs education in either special classes in ordinary schools or in special schools, it was typically the municipality that carried the financial responsibility. The financial responsibility for students enrolled in special needs education in special classes at ordinary schools and in special schools had been decentralised from the municipal to school level in 16 per cent and one per cent of the municipalities, respectively (Søndergaard Pedersen & Teglgaard Jakobsen 2012).

At municipal level, the economic incentives for including students with learning difficulties in ordinary education varied considerably. In the period 2007-2010, the typical response in half of the Danish municipalities in cases where the overall budget distributed for special needs education was overrun was to finance such overconsumptions within the schools' budgetary frame (or by reallocation of resources from other service areas). In the other half of the municipalities, the overconsumption was financed partly or fully by a supplementary appropriation for special needs education (Søndergaard Pedersen & Teglgaard Jakobsen 2012).

In the spring of 2012, as mentioned in Chapter 2, a legislative change was implemented in the Folkeskole Act defining special needs education more explicitly than previously, narrowing down the definition to activities in special schools, special classes and normal classes when the student attends at least nine hours of special needs education per week. In continuation of this, the national Government and LGDK agreed on principles for an increased inclusion of students in the Folkeskole, aiming at raising the proportion of students included in normal education to 96 per cent in 2015 (Baviskar et al. 2014).

A provisional evaluation based on a sample of 12 municipalities concludes that the financial incentives embedded in the new legislative definition of special education has played an important role in changing the inclusion process. In the 12 sampled municipalities, the student inclusion percentage gradually increased from 93.1 in 2010 to 95.5 in 2014 (Baviskar et al. 2014). The financial consequences are less conclusive. The budgetary changes vary across the 12 municipalities, but a descriptive perfunctory in-

spection of simple budgetary figures indicates that the total school budgets per student declined in the majority of the 12 municipalities. On the other hand, the budgets for special needs education increased in the majority of the 12 municipalities. So on the one hand, the increased inclusion of students is indicative of a higher efficiency, but on the other hand the budgetary changes are not indicative of a more economic use of resources – and so far no data exist on the effectiveness of resources in relation to the educational performance and well-being of the students, neither the included students nor the 'normal' students.

The results of the 12 municipalities are not necessarily generalizable to all Danish municipalities. There is no control or argument for other simultaneous changes in needs, economic conditions or service standards, and the design allows no causal conclusions.

Cooperation between schools and other stakeholders

Turning from financial resources towards organizational relations, a survey-based study describes the co-operation between the schools and other stakeholders (Andersen et al. 2011). Not surprisingly, the most important collaborator of the schools is the municipal school administrations. Two out of three schools are in weekly contact with the administration, primarily regarding economic matters. Other widespread collaborators are the municipal social administration, the pedagogical-psychological advisers (PPR), the supervision organisation for upper secondary and vocational education (UU) and the locally established coordinative body for collaboration between schools, social authorities and police (SSP).

The importance of these varies across schools, however, depending on the type of school and the socio-demographic characteristics of the students. The collaborative activities are most frequent for special schools, ordinary schools with special classes and schools with a relatively large proportion of students having a disadvantaged socio-economic background.

4.3 Studies of Distribution of resources and students to individual schools

In this section, the studies included focus on two main topics: Resource allocation to individual schools and distribution of students to individual schools.

Resource allocation to individual schools

Generally, the models for distribution of resources can be based on the number of classroom lessons to be provided, given then number of students and classes (lesson-based distribution), or on the number of students enrolled in the schools (activity-based distribution) – or a combination of the two. Contrary to the presumed dominance of the lesson-based model before, and in the immediate wake of Structural reform in 2007 (Gentofte, Gladsaxe, Greve, Helsingør, Hillerød og Høje-Taastrup Kommuner

[2008]), the impression of LGDK is that the activity-based model is dominant in the municipalities today. However, no systematic study is available.

In a case study of six municipalities from 2008, five of the six municipalities used lesson-based distribution; one municipality used activity-based distribution (Gentofte, Gladsaxe, Greve, Helsingør, Hillerød og Høje-Taastrup Kommuner [2008]). Based on the specific individual models, a 15 per cent change in student enrolment would have budgetary effects ranging from a 5.3 per cent to a 14.5 per cent change in school budgets. In all six municipalities, decisions regarding the number of schools, the size of school districts and the grade levels in each school were made at the municipal level, either directly by the municipal council (elected body) or by the central municipal administration.

In five of the six municipalities, decisions regarding the number of classes in each grade level were made at the individual school level. Moreover, in all six municipalities, decisions regarding the specific number of classroom lessons in each grade level were made at the individual school level (within the limits set by the minimum requirements of the national legislation) (Gentofte, Gladsaxe, Greve, Helsingør, Hillerød og Høje-Taastrup Kommuner [2008]).

Taking Copenhagen – the by far largest Danish municipality, covering 6 per cent of all Danish Folkeskole students – as an example, the 2014 budget for each school in Copenhagen is comprised of a school-specific component and a student-dependent/activity-based component (Københavns Kommune 2014) with the student-dependent component being the pre-dominant one in budgetary terms. The school-specific component includes, for instance, a base budget, building costs and budgets for bilingual purposes and special needs education.

The student-dependent part is graduated by the number of students in each form level. The budget for each school is allocated as grants adjustable within certain limits. For instance, the schools have the autonomy to decide the distribution between wages and other current expenditures. Furthermore, they are allowed to transfer up to 4 per cent of a budget surplus from one budget year to the next. If the budget is overrun by more than 2 per cent, an agreement on repayment should be made with the municipal administration (Københavns Kommune 2014).

In a survey-based study among municipal school directors, 42 per cent of the respondents are of the opinion that there is too little focus on student attainment and other performance measures when resources are distributed to the individual schools (Skolens Rejsehold 2010).

Distribution of students to individual schools

Distribution of students to individual schools, rather than the distribution of resources, is the subject of a number of other studies (Brøndum & Fliess 2010, Calmar Andersen & Thomsen 2011, Kristoffersen et al. 2015). Allocation of bilingual student to schools outside the school district in which the student reside was made possible by legal statutory in 2006. The number of municipalities adopting a policy with relation to distribution of bilingual students more than doubled from 2008 to 2011 (Andersen et al. 2012).

The municipality of Aarhus was an early adopter of this possibility. An evaluation of the Aarhus experiences was conducted in 2010 focusing on the children 'transferred' from their local school district to one of eight receiver schools in 2006/2007 and 2007/2008[41] (Brøndum & Fliess 2010). The evaluation is based on a combination of parent surveys, language screenings and registration of participation in after-school care, observational data from transfer buses and a wide range of interviews with children, parents and employees in the eight receiver schools (Brøndum & Fliess 2010). No data on any control group of non-transferred children are included.

The overall conclusion indicates that transferred children and especially the parents are positive with regard to the children's schooling. A majority of the transferred children did better in language screenings in Danish in the third grade and have progressed more from the 0^{th} to 3^{rd} grade than expected, parents of children in receiver schools generally have a positive attitude to the arrangement, and friendships between transferred and non-transferred students occur. However, some parents also express concern with reference to disruption/noise during class and during breaks initiated by the transferred children (Brøndum & Fliess 2010).

In Copenhagen, a dispersal model based on the willingness of parents of bilingual students to move their children to other school districts was implemented in 2006-2007 (Kristoffersen et al. 2015). The municipality of Copenhagen facilitated the model by, for instance, providing buses transporting children from their residential school districts to the other school district, which was eventually chosen by the parents. An evaluation based on the children's self-reported social relations indicates that social relationships in the 'receiver schools' are formed between native Danish and bilingual children, but that bilingual children 'dispersed' from other schools districts to a lesser extent than bilingual children from the local school district are part of these social relationships (Kristoffersen et al. 2015). The results are stable across years, i.e. over the three years of evaluation there is no increased tendency for dispersed students to be chosen by their peers (Kristoffersen et al. 2015).

[41] Bilingual students were transferred, if they were in "non-neglectable" need of support in Danish as a second language, and if more than 20% in the local district school per cohort had the same.

A study based on data before the legal statutory change in 2006 focuses on the effect of the share of immigrant students on student performance in the final exams in 9th form (Calmar Andersen & Thomsen 2011). The overall peer effect of immigrants at form level are found to be negative but modest in size: "Moving a student from a grade with 0 per cent immigrant students to a grade with 100 per cent immigrant students decreases the student's grade by 0.4 points on average on a scale from 0 to 13" (Calmar Andersen & Thomsen 2011).

A tipping point is estimated to be present at a share of around 50 per cent immigrants. In other words, when more than 50 per cent of the students have an immigrant background, student performance is negatively affected. In addition, asymmetrical peer-group effects are found, as a large share of immigrants seems to be more detrimental to the performance of immigrants compared to the performance of natives (Calmar Andersen & Thomsen 2011).

On a more general level, (Kristoffersen et al. 2015) find that an increased number of potentially disruptive children[42] lowers the achievement of peers in national tests. This estimate corresponds to increasing class-size by one student in the class-size effect literature. The strongest and most robust effects are found for children with parents convicted for crimes and children with a psychiatric diagnosis. Children with divorced parents do not affect peers' test scores on average. Heterogeneous effects seem to exist, however, as boys with divorced parents do affect peers to an extent, which is reflected in peers' score levels (Kristoffersen et al. 2015).

According to legal statute, parents are allowed to choose a Folkeskole in another school district rather than the local school in the district in which they reside, which is the school to which the child is initially assigned. The school chosen is required to admit the student if there is a vacancy. In addition, parents are also free to choose a private school, though they have to pay tuition fees. (Rangvid 2010a) tests whether the likelihood of choosing another school depends on the share of immigrants in the local school. Based on school choice for all students in the municipality of Copenhagen in 2003, and controlling for a rich set of covariates at student, school and neighbourhood level, the overall conclusion is that Danish parents are significantly more likely to opt out of schools in which a large proportion of immigrant students are enrolled, compared to immigrant parents (Rangvid 2010a).

Up to an immigrant concentration of about 35 per cent in the local school, Danish parents' decision to opt out is not affected. But Danish parents are far more likely to opt out as soon as the concentration exceeds 35 per cent. In addition, well-educated parents are significantly more likely to opt out at a given immigrant ratio compared to less

[42] Measured by the number of children with a psychiatric diagnosis and/or children with divorced parents or parents convicted of a crime.

educated parents. In contrast to Danish parents, only 20 per cent of the immigrant population who speak Danish at home respond to higher immigrant concentrations by opting out. This suggests that ethnic segregation across schools is increased by the different behaviour of Danish and immigrant parents (Rangvid 2010a). However, it should be noted that Copenhagen is by far the largest and most urbanized municipality of Denmark. Therefore, the results are not likely to be fully generalizable to all Danish municipalities.

Finally, turning to the split between public and private schools the students in private schools are not 'distributed' by the municipalities, but as a result of parents' free choice. Nevertheless, the existence of private schools may be important for the number and characteristics of the students available for 'distribution' in the municipal schools. The competition from private schools may affect not only the possibilities for establishing an economically efficient municipal school structure (see Section 4.4 below) but also the performance of the public schools. As noted under the section 'Governance of resources', competition from private schools does not seem to improve achievement of public school student performance. In contrast, the results show that more competition implies higher public school spending (Calmar Andersen & Serritzlew 2007).

A recent study by LDGK investigated whether parents' choice between public and private schools is affected by the degree of inclusion of children with special education needs in normal classes in the Folkeskole, and found that this is not the case (KL 2014). Neither the degree of inclusion nor class size, expenses per student, grades or sickness absence of teachers seem to be correlated with the parents' choice between public and private schools (KL 2014). The conclusion, however, is based on bivariate analyses and conducted at municipal level, not at school level. In addition, the choice of school may to a large extent be a reflection of tradition and culture more than a fully informed and deliberate choice between the Folkeskole and a private school. In some municipalities there is a long-lasting tradition for nearly 30 per cent of the students attending private schools whereas in other municipalities the share of private school students rarely exceeds five per cent (see Table 8, p. 161 in Appendix 1).

4.4 Studies of School structure and distribution of school facilities and materials such as ICT

The amalgamation of municipalities in 2007 as part of the Structural reform was considered to be a decision-making platform for establishing a more effective school structure based on fewer and larger schools. Against this background, a number of studies have studied the development of the Danish school structure after 2007 and, in particular, whether any distinct school-structure effect can be identified in the amalgamated municipalities. However, none of the studies finds any significant amalgama-

tion effect on the development in the school structure (Bækgaard 2010, Feilberg & Hovgaard Mathiasen 2012). Two opposing policy-effects could be in play, spanning different aspects of economic and political accountability (Bækgaard & Teglgaard Jakobsen 2011):

1. Merging or closing schools could provide economies of scale. Amalgamation of municipalities makes these school mergers feasible.
2. Amalgamation could also give rise to geographical distribution struggles, limiting the number of school closures or mergers.

Neither of the two above assumptions is verified empirically. The likelihood of a school avoiding closure is not contingent on being part of an amalgamated or a non-amalgamated municipality, when comparing the pre-reform school year 2005/06 to the post-reform school year 2008/09. The probability of a municipal school being closed down is not dependent on whether the municipality was amalgamated or not but on the pre-reform number of students, the presence of a private school alternative, population size, population density and number of public schools.

As 2008/2009 is only 1½ years after the amalgamation – and as many councils in amalgamated municipalities had an explicit or implicit agreement of non-decision making in the first election period in relation to the politically sensitive question of school structure – an amalgamation effect on school closure is more likely to be found in the election period from 2009-2013. However, this was not the case either. Utilising a difference-in-difference design (DiD), a more recent study (Feilberg & Hovgaard Mathiasen 2012) finds no significant differences between amalgamated and non-amalgamated municipalities, when it comes to school closures or changes in average school size from 2004 to 2011. What matters is the number of students and changes in the number of students. In line with this, a more descriptive study finds that school closures in the 20-year period from 1993-2012 were most frequent in the most rural municipalities and least frequent in urban municipalities (Svendsen 2013).

Similarly, a pre-reform study of school closures at parish level finds that the vast majority of school closures from 1990-2007 took place in rural parishes and typically involved small schools (Teknologisk Institut 2008). A pre-reform survey of parent attitudes finds that 60 per cent of the parents consider school proximity to be important for their place of residence. However, statistically, areas with closed schools do not experience changes in settlement patterns, and school closures seem to be a symptom of population stagnation – not a cause (Teknologisk Institut 2008). In general, the frequency of school closures increased between 2011 and 2012 (Feilberg & Hovgaard Mathiasen 2012). This seems to be a result of a combination of a decreasing number of students and increased fiscal pressure due to financial crises as well as a threat of na-

tional sanctions for overrunning budgets rather than a result of increased political decision-making capacity, due to the amalgamation reform in 2007.

None of the studies provide systematic evidence on the economic consequences of the changes in school structure towards fewer and larger schools. However, in parallel with the accelaration in the frequency of school closures and the increase in the number of students in each class post 2009, (see Appendix 1, Table 2 and Table 4), the school expenditure per student has decreased significantly (BDO 2014a). Both the expenditures for normal education and segregated special needs education have decreased (BDO 2014a). There is no reason to believe that the development towards fewer, larger schools and the decreasing unit costs are not interconnected.

Presumably, changes in school structure are thus one of the factors contributing to the decline in expenditures per student. A modifying factor may be that in some cases private schools are replacing municipal schools when the latter are closed down (often physically in the same school buildings),thus partly neutralising the potential municipal economies of scale relating to closure of the smaller municipal schools. This has not been studied systematically, however. A previous case-study of two municipalities with similar socio-economic needs points to the number of small schools as one of the explanations for higher school expenditures in one municipality compared to the other (Rambøll 2010).

Due to technicalities in the municipalities accounting system, the exact *spending* on maintenance of schools is not visible. In order to obtain an indication of maintenance costs and standards, accounting data have to be combined with survey data from the municipalities along with engineer evaluations of the physical state of the buildings. The latest study of this kind was carried out in 2009 and reported severe maintenance challenges, especially related to old buildings built before 1980 (KL 2009a, KL 2009b).

The self-reported need for maintenance in the period 2010-2013 was estimated – with uncertainty – to be 700 million DKK higher than budgeted in 2009. The costs of enlargements and adjustments of the existing portfolio of building projects in the period 2010-2018 were estimated to be 2 billion DKK higher per year than budgeted in 2009. This indicates that the municipalities push a lump of maintenance costs in front of them. Since 2009, many small schools have been closed, and as a result the maintenance backlog may be smaller today. Also, a ‘Quality Fund’ of 22 billion DKK has been established by the national government in order to co-finance municipal investments 2009-2018 in the physical framework of the Folkeskole along with day care and elder care facilities. However, no study provides data on the current physical standard of the school buildings.

No studies provide knowledge on the distribution of school facilities and materials (e.g. ICT) in the Danish Folkeskole. However, one study however gives insight into the effects of using ITC, namely the effects of ITC-supported teaching on students reading abilities in Danish (Præstgaard Christensen et al. 2014). Based on a randomized experiment in the Municipality of Horsens with performance data from pre and post-scores in national tests, it is concluded that integrating text-to-speech software from the 4th to the 6th form as part of ordinary teaching has a positive effect on both text understanding and decoding of text. The most positive and significant effects are found for students with weak or average reading abilities (Præstgaard Christensen et al. 2014). The effects are also found, when students do not have access to the ITC tool in the actual test situation. As the study was carried out in a single municipality, the findings are not necessarily generalizable to all Danish municipalities.

At a more aggregated level, an evaluation of the national tests finds that the national tests themselves have a positive effect on student performance (Rambøll 2013). Based on an experimental design, it is concluded that national tests have positive effects on the students' overall reading abilities, most markedly for receptive language abilities and decoding and least markedly – but still statistically significant – for text understanding.

As no measures of the costs of the ITC tools used in the Municipality of Horsens and the costs of the national tests are provided, no definite conclusion on the *cost-effectiveness* of these tools can be drawn. But the *effects* of both the locally initiated ICT tool and the standardised national test system seem to be positive.

4.5 Studies of Distribution of teacher resources

Due to time and resource constraints, the search strategy of the review has paid no particular attention to teacher education, recruitment and the prerequisites for the teaching. However, a number of the studies found describe the existing teaching body along with various background and competence factors, and a number of studies also analyse the framework for utilisation of teachers' working hours and the use of special resource persons in the teaching environment.

The teaching body

According to a survey-based study as part of TALIS 2008, the share of female teachers in 2008 was 58 per cent, and the age distribution among teachers was such that more than half of the teachers were 40 years old or older (Egelund 2009). More than ¼ of the teachers teach in schools in which the school leaders are of the opinion that qualified teachers are in short supply (Egelund 2009). Newer TALIS figures on the gender and age composition of the teaching body are not available, as this is not part of the later TALIS 2013. According to the membership database of the union of Danish

teachers, the share of female teachers in 2015 is 71 per cent, and 62 per cent of the teachers are 40 years or older[43]. The teachers responding to TALIS 2008 participated in a range of supplementary education activities, ranging from formally qualifying education over courses, which are the most frequent kind of activity, to coaching from other teachers.

Courses and seminars in professionally relevant topics are quite frequent in Denmark, whereas observational visits to other schools rarely occur. The greatest need for professional competence development in Denmark, as well as internationally, lies in education of students with special educational needs (Egelund 2009). Compared to other TALIS countries, a relatively large proportion – approx. 25 per cent – of the Danish teachers had not participated in any form of upgrading of skills in the last 18 months in 2008. Denmark is the TALIS country in which teachers to the largest degree hold the perception that their employer does not support professional competence development. A perception that is especially present among the older teachers above 50 years of age (Egelund 2009).

Among the TALIS countries, publication of evaluation results is to a large extent a distinctive feature of the Danish school system, including the utilisation of quality reports and publication of the average final exam marks (Egelund 2009). Self-evaluation seems to be the most frequently applied evaluation method. According to the TALIS survey, evaluations are viewed as having little influence on school practices. Evaluations are utilised to a lesser extent in Denmark than in other TALIS countries (Egelund 2009). In line with this, the 2013 TALIS survey shows that Danish teachers to a lesser extent co-operate with fellow teachers on establishing common standards for evaluations and for evaluation of progress in student performance. In comparative terms, Danish teachers rarely discuss the learning and progress of specific students with other teachers (Danmarks Evalueringsinstitut 2014). The feedback given to teachers is mainly from other teachers and less frequently from the school leaders (Danmarks Evalueringsinstitut 2014).

Special resource persons

Two studies focus on the inclusion and effects of special resource persons in the teaching environment. One study based on survey data evaluates the distribution of special resource persons and finds that a vast majority of the schools in 2009 had one or more special resource persons attached. 96 per cent of the schools had IT instructors, 91 per cent reading instructors, 90 per cent special education coordinators, 89 per cent 'behaviour-contact-wellbeing' instructors (AKT instructors[44]), 88 per cent school librarians and 78 per cent teachers with special responsibilities in relation to the cooperation

[43] http://www.dlf.org/media/6236309/aktive-medlemmer-af-dlf-fordelt-paa-fraktion-aldersintervaller-og-koen.pdf

[44] AKT instructors have received supplementary training and courses in advising and guiding fellow teachers to handle students challenged by behavioural, social contact or wellbeing issues.

between schools, social authorities and police (Danmarks Evalueringsinstitut 2009b). On top of this, a number of instructors in motoric functions, mathematics, natural science, health, language subject and evaluation are found. If the compulsory school librarians are excluded, the schools distribute 1.13 man years on average for special resource persons, with the most resource-demanding functions being the instructors in Danish as second language, AKT instructors and IT instructors (Danmarks Evalueringsinstitut 2009b).

A teaching assistant experiment initiated by the Ministry of Education gave a number of municipalities and schools the possibility of including teaching assistants in the teaching environment (Rambøll 2011). An evaluation of the experiment (Rambøll 2011) concludes that the use of teaching assistants is beneficial, especially for the weak students' wellbeing and performance. Unfortunately, the design does not make any valid causal conclusions possible, as no control groups are included and the conclusions on the effects on students are – at best – based on self-assessed progress by the students. The conclusion is thus at best indicative. In addition, no cost measures are included, and the study accordingly fails to provide a valid basis for any conclusions as to whether teaching assistant improve the effectiveness of resource use in schools.

4.6 Studies of Distribution of school leadership resources

None of the studies found describe in full detail the composition of the school leaders in terms of age, professional background and qualifications. However, a number of the studies contribute to providing a picture of school leaders' characteristics and the conditions for school leadership.

According, to a survey-based study the share of female school managers in 2009 was 35 per cent, and the age distribution among managers such that 2/3 were more than 50 years old (Egelund 2009). In comparison with other TALIS countries, the management practice of Danish school leaders is not particularly focused on formal rules and documentation. School management focuses on pedagogical practice, i.e. on the training of the teachers and the challenges related to this, and supporting the teachers through pedagogical dialogue and supervision. In comparison with other TALIS countries, Danish school leaders are the ones that practise leadership focusing on documentation and administrative management to the least extent. The Danish management approach is also characterised by a relatively limited emphasis on management by objectives and in-class supervision of teaching (Egelund 2009).

In 2013, Denmark was the TALIS country in which school leaders had observed teaching in the class rooms most infrequently (Danmarks Evalueringsinstitut 2014). In total, school management in Denmark is ranked relatively low compared to other TALIS

countries, both when it comes to pedagogical leadership and administrative leadership (Egelund 2009). School leaders emphasising a pedagogical leadership style are generally the most experienced and well-educated among the school leaders. Among school leaders emphasising an administrative leadership style, more weight is given to student test results, marks at the final exams and developing an innovative education practice leadership (Egelund 2009). On average, the leaders report that they spend half of their working time on management and administrative tasks, and another 40 per cent is equally shared between tasks and meetings relating to the content of the teaching and to the teaching itself (Danmarks Evalueringsinstitut 2014).

At the overall level, another study estimates that approximately 2/3 of the administrative costs at school level are attributable to the school management, and the remaining 1/3 to administrative personnel, technical staff and deputy heads (BDO 2014b). The school management in Danish schools is organised into management teams with shared responsibilities more frequently than in other TALIS countries (Danmarks Evalueringsinstitut 2014)[45].

A study based on a combination of national surveys and qualitative interviews with the school leaders at six schools confirms that the majority of the leaders are male, hold a teacher background and have considerable experience (Pedersen et al. 2011). As part of their management strategy, a substantial majority of the schools have formulated aims or values for student well-being (91 per cent), the professional standard of the school (77 per cent), student learning targets for the individual subjects (74 per cent) and for the students' subsequent admittance and completion of upper secondary education (60 per cent) (Pedersen et al. 2011). In addition, the conditions for and the shaping of the school management are contingent on the size of the school, as larger schools have more experienced school managers with higher salaries and longer working days, more deputy heads and more delegation of administrative tasks.

Larger schools are more frequently organised on the basis of student age-divided departments and teams, have more external contacts and a higher degree of formalisation in the form of, for instance, evaluation and written goals, along with more frequent and systematic evaluation of the students' final exam marks and the students's subsequent participation in upper secondary education (Pedersen et al. 2011). In general, the leaders express a critical view towards regulation from the municipality. However, as the study is not aimed at studying the costs and effects of school leadership, and is basically not designed to provide valid causal inferences, no conclusions on the significance of management for the effectiveness of resource use in schools can be drawn from this study.

[45] Again it should be noted that the school reform and the new working hour regulations for the teachers being implemented as of the summer of 2014 sets up new goals for the Folkeskole, a new framework for the school day and provides school managers with more management autonomy. Therefore, most of the pre-reform findings reported in the text may not reflect the reality of Danish school management from 2014 on.

Comparison of Denmark and Texas on the basis of parallel surveys of school leaders and registry data on student performance (Meier et al. 2015) more systematically tests whether the characteristics and leadership style of schools leaders affect the performance of students. The study concludes that only leader experience and personnel quality are important for performance in Denmark, whereas in Texas a whole range of management variables are significant, including variables relating to external/outward management (Meier et al. 2015).

Summing up, the study concludes that virtually no significant effects of management are found for Denmark, whereas in Texas both outward and inward management relate to student performance (Meier et al. 2015). In line with this, a study comparing public and private schools in Denmark prior to the amalgamation reform in 2007 finds that (Hvidman & Calmar Andersen 2014) the use of performance management tools by the school leader only affects scores at the final exams positively in private schools. In public schools the use of performance information does not affect test scores significantly. Performance management thus seems to be less effective in the public sector compared to the private sector, and management tools proven to work in the private sector do not necessarily transfer successfully to the public sector (Hvidman & Calmar Andersen 2014). One reason for the non-effect of performance management tools in public schools may be that managerial authority moderates the effects. According to another study managerial authority over human resources positively moderates the effect of performance management, whereas decentralising goal setting works in the opposite direction (Nielsen 2014b).

(Thorgaard & Munk Quist Andersen 2014) sets out to disentangle the causal relationship between bureaucracy and school performance at school level and concludes that the increasing number of administrative employees in schools seems to be a result of rather than a cause of poor performance (Thorgaard & Munk Quist Andersen 2014). Bureaucracy is defined as the number of administrative employees at school level, e.g. school leaders, deputy heads, heads of departments, secretaries and school psychologists. Based on a set of time-lagged statistical analyses of the relationship between the number of administrative employees at school level and student performance at the school-leaving examination in the subjects Danish and maths (Granger causality test), the study concludes that low performance generates increasing bureaucracy, but that bureaucracy, on the other hand, does not generate low performance (Thorgaard & Munk Quist Andersen 2014).

In sum, these findings lead to the conclusion that schools and politicians have a tendency to overreact to poor performance, as the result is an increase in administrative costs, which again does not have a positive effect on performance (Thorgaard & Munk Quist Andersen 2014). However, one should be cautious with regard to this interpretation, as it may simply be changes within the auxiliary functions – such as school psychologists – that affect the result.

Finally, a case-based study investigates the recent changes in the external context of school leadership and whether these changes are reflected and enacted in leadership practice (Moos, Johansson & Skedsmo 2013). Based on comparisons of case studies in 2004/2005 and 2009, the study concludes that the intensified and strong focus on schools reporting performance to the municipal level and the schools' results in the standardized tests represent a powerful means for holding school leaders accountable. Overall, it is concluded that the leadership practice has not changed over the 5 year period, but increasing attention is observed to the external demands following the national goal-setting and accountability demands (Moos, Johansson & Skedsmo 2013).

The use of more detailed and stricter social technologies, such as testing, comparisons, rankings and benchmarking, are reported, resulting in most school leaders being more focused on effectiveness. The shift in external expectations has also had an impact on the inner life of schools, in the sense that the need to measure outcomes and the more detailed national goals, especially with respect to literacy and numeracy, have brought more attention to these curriculum areas and less to cross-curricular activities ((Moos, Johansson & Skedsmo 2013). Unfortunately, the study provides no systematic information on either the observation studies or interviews carried out, or on how and why the 4-5 schools selected for the case studies were selected. Accordingly, the validity of the study and the generalizability of the findings are limited in nature.

4.7 Studies of Programmes targeted to specific students

The studies found that focus on student groups with special needs are divided into two strands, namely studies relating to special needs education and studies relating to immigrants.

The studies of special needs education reflect the national aim since 2012 of reducing exclusion of students with special educational needs (Baviskar et al. 2014). Overall, the studies provide a picture of a special educational needs landscape characterised by municipal autonomy and a variety of locally decided and not fully transparent ways of organising and distributing resources to students with special educational needs (Houlberg, Rangvid & Østergaard Larsen 2013, Søndergaard Pedersen & Teglgaard Jakobsen 2012). The total school expenditure in a municipality may depend on the exact way of organising and financing special needs education (Rambøll 2010).

No systematic comprehensive studies of the current degree of decentralisation of financial responsibilities for special needs education to individual schools are available. However, the impression is that an increasing number of municipalities decentralise the financial responsibility for special needs education to the individual schools, decentralise a wider range of the special needs education activities and to varying degrees include socio-economic criteria in the distribution models (Baviskar et al. 2014,

Københavns Kommune 2014, Teglgaard Jakobsen 2012, Astrup Bæk & Teglgaard Jakobsen 2014b).

However, the more specialised the special needs education service is, the lower is the likelihood of the service being financially decentralised to the school level. In 2011, almost 90 per cent of the municipalities decentralised the financial responsibility for ordinary special needs education taking place in ordinary classes (less than 9 hours/week) to the individual schools, 28 per cent decentralised single-integrated special education (more than 9 hours/week), 16 per cent the financial responsibility for special education in special classes and a mere one per cent of the municipalities decentralised the financial responsibility for students in special schools (Søndergaard Pedersen & Teglgaard Jakobsen 2012).

In 2014, the economic resources for special needs education in 12 selected municipalities were distributed according to the number of students per school and, in most cases, with an extra pool of money reflecting the socio-economic background of the school district (Baviskar et al. 2014). The resources are distributed for the following uses: special education at the school, payment for students taking integrated special needs education at other schools, supplementary education and other educational support (for individual students) and projects promoting inclusion. Accordingly, the school leaders are responsible for the allocation of resources. The case-study indicates that resources are distributed with the aim of increasing the teachers' competences to include students with learning difficulties in ordinary school classes (Baviskar et al. 2014).

The socio-economic models for distribution of special education need resources in general may be based on either socio-economic models developed by the municipality itself (the municipality of Aarhus for instance (Astrup Bæk & Teglgaard Jakobsen 2014a)), KORA or other analysis agencies. The models are based on either local data on the specific students receiving one of the special needs education services offered (Arendt & Kiil 2013) or on nationally available data estimating the average nationwide probability of a student receiving special needs education services (Teglgaard Jakobsen 2012, Astrup Bæk & Teglgaard Jakobsen 2014b). One example is a nationwide model based on register data on 600,000 students and their parents. The model estimates that the probability of receiving segregated[46] special needs education is higher for boys, adopted children and students in secondary class levels. The probability is lower for students of parents with higher education and income and students from two-parent families and lower the higher the age of the mother when the student was born (Astrup Bæk & Teglgaard Jakobsen 2014b).

[46] Segregated special education includes students in special classes and special schools. Special education in ordinary classes is not included.

The other strand of studies of student groups with special needs focuses on immigrant students, including the general performance of immigrant students, the effects of immigrant concentration and the effects of specific programs aimed at bilingual students.

In general, immigrant students perform less well than their native peers both in PISA tests (Rangvid 2007, Rangvid 2010b) and in the school-leaving examinations (Houlberg, Østergaard Larsen & Rangvid 2013). Differences in socioeconomic status account for only 50 per cent of the ethic test score gap, i.e. even after controlling for socio-economic status, a substantial gap for the students in Copenhagen remains (Rangvid 2007). Adding control for language spoken at home reduces the gap a bit more. Another study finds that native Danes are more likely than immigrants to opt out of the local district school if the immigrant concentration exceeds a certain limit (Rangvid 2010a). In line with this, immigrants seem to choose poorer schools with regard to peers and specialisation of teachers. On the other hand, immigrants generally attend schools with more Danish lessons, lower class sizes and higher student to teacher ratios (Rangvid 2007). The parental choice of school accounts for another share of the native-immigrant test score gap, but still a native-immigrant test score remains.

The share of immigrant students has a negative effect on student performance, when the share of immigrants exceeds a tipping point estimated to be around 50 per cent (Calmar Andersen & Thomsen 2011). The peer-group effects seem to be asymmetrical, as a large share of immigrants is more detrimental to immigrants' performance compared to natives (Calmar Andersen & Thomsen 2011).

(Andersen et al. 2012) maps the use of policies and goals with respect to bilingual students in municipalities and investigates the implementation of these in schools. The effects of systematic work with bilingual students are evaluated based on student performance, wellbeing and degree of transition to upper secondary education. For the school year 2010/2011, between 56 per cent and 63 per cent of the municipalities (according to the school directors) state that they have policies regarding additional teaching in Danish as second language, language stimulation of pre-school children and Danish as a second language as a dimension in all subjects. Only between 33-36 per cent of the school leaders state the same. Hence, the perception of school directors and school leaders are not congruent.

Fewer municipalities have policies regarding transition into upper secondary education (~33 per cent). Most schools offer supplementary mother-tongue teaching outside classes but during normal school hours. This is in opposition to the stated national goals. In municipalities with many bilingual students, a positive relationship between municipalities' general stated goals and student performance is found. The relationship is not found in municipalities with few bilingual students. On the contrary, concrete stated goals such as mentor arrangements, homework tutoring and special counselling only work in municipalities with few bilingual students. There is no relationship between

policies and student wellbeing. (Andersen et al. 2012) also finds that additional teaching in Danish as a second language is only positive if it is done as a supplement to normal teaching hours. If the bilingual students are taken out of their normal classes and, thus, miss part of their normal teaching, to be taught additional Danish, the effect is negative. There is no clear evidence of how policies regarding transition between lower and upper secondary education affect performance and wellbeing.

A case-study in 10 municipalities investigates the implementation of three different experiments with mother-tongue-based education conducted in public schools (Rambøll 2014). The study does not find support for the hypothesis that the mother-tongue experiments will work better in schools were leaders have a high focus on teaching bilingual students. A suggested explanation for the non-effects of leadership is that schools with many bilingual students already have highly qualified teachers when it comes to handling experiments with mother-tongue-based teaching. In sum, the school leaders are not important for the implementation, when teachers already have knowledge in the field in which the experiment is carried out (Rambøll 2014). The first phase of a RCT-based study of the effects of the experiments was carried out in 2014 using test scores in national tests in 2nd and 4th form students as indicators of student performance (Calmar Andersen, Humlum & Brink 2014).

The analysis shows that both additional teaching in Danish for all students and a newly developed education programme for common receptive language ability have a positive effect on the reading ability of the students, at least in the short run where data are available at the time of analysis. At the same time, the analyses show that the monolingual students in particular benefit from the experimental efforts. Despite the efforts being aimed at bilingual students, these students do not seem to be among the students benefitting the most from the efforts (Calmar Andersen, Humlum & Brink 2014). The part of the experiments that strengthened the maths teachers' use of language in maths teaching does not seem to have any significant effect on the students' reading abilities (Calmar Andersen, Humlum & Brink 2014).

4.8 Summary and synthesis of knowledge regarding resource distribution

The Danish municipalities are granted a high degree of autonomy in allocating resources for the Folkeskole, and no comprehensive picture exists of the resulting diversity in organisation, budget models and principles for decisions on the school budget and the allocation of resources to individual schools and purposes. In addition, the individual schools have varying degrees of autonomy with regard to deciding the distribution between wages and other current expenditures, as well transfering a limited part of the budget from one budget year to the next.

According to the reviewed studies, 95 per cent of the Danish municipalities use some form of demographic budgeting when determining the size of the school budget. Especially when determining the budgets for normal education, whereas demography-dependent budgets are used to a lesser extent for special needs education. No systematic data were found, but the overall impression is that activity-based models based on the number of students enrolled in the schools are dominant in the municipalities today, both when it comes to the entire school budget and the allocation to individual schools – and lesson-based distribution models play a minor role. In some sort of combination with central pools for segregated special needs education etc. and possibly a student-independent base budget for the individual schools.

The financial responsibility for 'included' special needs education in normal classes is to a large extent decentralized to the individual schools, whereas budgets for segregated special needs education in either special classes in ordinary schools or in special schools in general lies with the municipality. In the wake of the financial crisis and incentives embedded in a new legislative definition of special education in 2012, it seems that more students with special needs are included in normal classes, and the municipalities decentralise the financial responsibility for special needs education to the individual schools to a larger degree and increasingly include socio-economic criteria in the distribution models.

In general, immigrant students perform less well than their native peers. In the Danish case, the share of immigrant students has an additional negative effect on student performance, when the share of immigrants exceeds a tipping point estimated to be around 50 per cent. Following a legal change in 2006, a number of municipalities implemented shifting of students with immigrant background from school districts and schools with a large number of immigrants (or pupils from a disadvantaged socio-economic background) to schools districts with more students of non-immigrant background, with the intention of improving equality in the educational performance of students. The first indicative evaluations suggest positive effects of this student redistribution policy, including – in municipalities with many bilingual students – a positive relationship between general stated goals in student distribution policies and student performance.

Studies of specific experiments point to positive student performance effects of both text-to-speech software and of mother-tongue programmes based on additional teaching in Danish and use of an extended education programme for common receptive language ability. Text-to-speech software is estimated to affect reading comprehension and text decoding positively, while there is no effect on receptive language ability. Both additional teaching in Danish for all students and a newly developed education programme for common receptive language ability have a positive effect on the reading ability of the students.

Despite the fact that efforts were aimed at bilingual students, particularly the monolingual students are benefitting from the experimental efforts. At a more aggregated level, an evaluation of the national tests finds that the national tests themselves have positive effects on the students' overall reading ability. None of these studies include cost measures and thus they provide no platform for concluding whether a more effective use of resources has accompanied the positive student performance effects achieved.

The experience from the Danish Structural Reform in 2007 suggests that amalgamation of municipalities is no short cut to a school structure with fewer and larger schools. The development in the number of students, competition from private schools and economic pressure seem to be more important factors. Increased fiscal pressure seems to be an important factor behind the increased frequency of school closures since 2011, which in turn has contributed to an increase in the average size of the municipal schools. No systematic studies have been carried out on the economic effects of the development towards fewer and larger schools, but there is no reason not to believe that school closures has played a substantial role in decreasing the school expenditure per student in the Danish Folkeskole since 2009.

5 Resource utilisation

The main focus of the theme of Resource Utilisation will be on the municipal and school levels. Many core decisions on implementation and utilisation of the allocated resources are made by the municipalities and the school leaders.

In order to understand the context of the reviewed studies, the chapter will first introduce the relevant regulatory framework and describe the main trends regarding resource utilisation:

- The size of schools and classes
- The framework for utilisation of teachers' working hours
- The organisation of the school year and school day.

The size of schools and classes
Within the legal framework of the Folkeskole Act, the municipalities are granted the autonomy to organize the school structure. The number and size of schools as well as the number and size of classes is a municipal matter as long as the nationally set minimum number of lessons at each form level is met, and the size of the classes does not exceed 28 students.

As lined out in Chapter 2, the number of students in the Folkeskole as well as the number of schools have been declining. Several municipalities have subjected their school system to structural reforms and as a result have closed down smaller schools or merged schools practicing joint management across two or more cadastres. Since 2007, the number of schools has been reduced by a net 271 schools (from 1584 to 1313), equalling a closure of 17 per cent of the schools existing in 2007.

Table 5.1 Number of primary and lower secondary schools in Denmark, 2007-2014

	2007	2008	2009	2010	2011	2012	2013	2014
Number of public schools	1,584	1,542	1,529	1,503	1,377	1,318	1,312	1,313
Number of closed public schools (net)	14	42	13	26	126	59	6	-1
Number of private Schools	497	506	504	506	520	537	548	555
Number of special schools	194	197	198	206	195	184	181	175

Note: In addition to physically closed schools, changes in the number of schools may also include schools that are amalgamated organizationally but not physically. For instance, two schools organizationally amalgamated to one unit with one school leader, but continuing to have two physical locations of buildings and teaching. The number of closed schools is calculated net.

Source: The Ministry of Education: http://uvm.dk/Service/Statistik/Statistik-om-folkeskolen-og-frie-skoler/Statistik-om-grundskoler/Antal-grundskoler

In line with the declining number of schools, the average size of a Folkeskole has increased. The average number of students per school across the municipalities is 442 (2013).

Table 5.2 The size of the Folkeskole based on the average size of schools per municipality 2007-2013

	2007	2008	2009	2010	2011	2012	2013
Average	362	366	370	371	390	424	442
Min.	162	162	161	193	211	240	237
Max.	686	696	963	922	875	1,096	2,114

Note: The figures are based on the municipalities' budget assumptions for the year and show the average school size in each municipality. The individual schools in each municipality may be smaller or larger. The figures are based on the school as an organizational unit. The number of schools may therefore include schools that have been amalgamated organizationally but not physically. For instance, two schools that are organizationally amalgamated to one unit with one school leader, but continue to have two physical locations of buildings and teaching.

Source: www.noegletal.dk. Published by the Ministry of Economic Affairs and the Interior.

Based on the number of students per school, the general trend is towards larger schools. However, it is worth noting that there are still large differences across municipalities between the smallest and largest school sizes measured by the number of students enrolled.

Classes are basically formed based on the age of the students and not the students' proficiency. In recent years, the number of students in each class has increased for all form levels, from pre-school (form 0) to form 9 and the non-compulsory 10th form. In total, i.e. including all form levels, the average class size increased from 20.1 students in 2009 to 21.4 in 2013

Table 5.3 Average class size for each form level of the Folkeskole 2009-2013

Form	2009	2010	2011	2012	2013
0 (pre-school)	20	20.1	21.4	21.9	21.5
1	19.8	20.2	21	21.3	21.6
2	19.8	20	20.9	21.4	21.3
3	19.9	20.1	20.6	21.2	21.4
4	20.1	20.1	20.7	21.1	21.3
5	20.1	20.2	20.7	21	21.1
6	20.3	20.2	20.8	21.1	21.2
7	20.9	21.3	21.6	22.2	22.1
8	20.9	21	21.5	21.7	21.9
9	19.4	19.7	20.1	20.1	20.4
10	20.8	21.4	21.5	21.5	21.6
Total form 0-10	**20.1**	**20.3**	**20.9**	**21.3**	**21.4**

Note: Early September figures. Special schools not included.

Source: Statistics Denmark, www.statistikbanken.dk, KVOTIEN.

Though the general trend is towards larger classes, there is large variation across the municipalities. The average class size in the municipalities in 2013 varied from 18.6 students to 24 students.

Table 5.4 Average class size of the Folkeskole across Danish municipalities 2007-2013

	2007	2008	2009	2010	2011	2012	2013
Average (unweighted)	20.2	20.4	20.4	20.5	20.9	21.3	21.5
Min.	16.8	17.3	17	17.2	17.9	18.7	18.6
Max.	23.5	23.5	22.6	22.8	23.2	23.7	24

Note: The figures are based on the municipalities' budget assumptions for that year.
Source: www.noegletal.dk. Published by the Ministry of Economic Affairs and the Interior.

Framework for utilisation of teachers' working hours

As described in Chapter 2, a new framework regarding the utilisation of working hours and working conditions for the teachers has been implemented as of 2014, along with the comprehensive school reform. The new working agreement is the result of a legal intervention by the national parliament to solve a long-standing conflict between the teachers' union and LGDK. This legal intervention ended a long tradition for working hour regulations being agreed upon nationally between the teachers' union and LGDK. These agreements constituted the framework for organising and utilising the time that teachers spend on their work, including ratios negotiated between the municipalities and the local branches of the teachers' union for the time to be spent on preparation of teaching relative to the time spent for teaching. With Act 409, time management rules were dispensed, giving school leaders greater managerial discretion and local decision-making autonomy regarding the number of lessons that each teacher is to teach and the teaching-preparation ratio for individual teachers and subjects. The new regulation changes the framework for the utilisation of working hours, as it does not specify norms for the time to be used on the various tasks of the teachers.

Until the summer of 2014, two national agreements on working hour regulations existed side by side. Each municipality had to decide in negotiation with the local branch of the teachers union whether the 2005 or the 2008 agreement should be adhered to by the schools of the municipality. After the 2008 agreement was agreed upon at the national level, if the municipalities and the local branch of the teachers union were unable to agree on the local elements of the agreement, the 2005 agreement would remain in effect locally (Lynggaard 2013). The main difference between the 2005 agreement and the 2008 agreement is that the 2008 agreement provided the teachers with more autonomy to independently organise their working time and a larger degree of autonomy for the teachers and the school leaders to change the scope and content of various teacher tasks (Lynggaard 2013). Core elements in both the 2005 and 2008 agreement were nationally negotiated, and norms on the proportions of the working time for the teachers to be allocated to various tasks, including norms for teaching-preparation rati-

os, were locally implemented. In 2013, 86 out of the 98 municipalities had agreed with the local branch of the teachers union on adhering to the 2008 agreement.[47] With the new Act 409 of 2013, both the 2005 agreement and the 2008 agreement were terminated.

Organisation of the school year and the school day

The school year is basically organised into 40 weeks of teaching. The Folkeskole Act specifies a minimum number of lessons for different subject areas at the various form levels from the 1st to 9th form. The minimum number of lessons applies for three-year periods. The minimum number of lessons for the school year 2010/2011 can be seen below.

Subject area	1st to 3rd form	4th to 6th form	7th to 9th form
Humanistic subjects	1,090 (of this at least 900 lessons of 'Danish')	1,015 (of this at least 180 lessons of 'History')	1,320
Science subjects	560 (of this at least 450 lessons of 'Mathematics')	515	790
Practical/creative subjects	430	690	325
Class time	70	70	85

Besides these minimum numbers of lessons, the Ministry of Education provide recommendations as to number of lessons per year for each specific subject at each form level. For the 1st form, these numbers are 330 lessons of 'Danish', 150 lessons of 'Mathematics', and 30 lessons of 'Music', etc. For the 9th form, there are 180 lessons of 'Danish', 120 lessons of 'Mathematics', 90 lessons of 'English' etc. The sum of these recommended numbers of lessons exceeds the minimum number of the lessons.

With the reform of the Folkeskole in 2014, the minimum number of lessons was raised to 1200 *per year* for pre-school to the 3rd form, to 1320 for the 4th to 6th form and 1400 for the 7th to the 9th form. Based on a number of school weeks of 40, this equals an average school week of 30 hours for form levels 0-3, 33 hours for form levels 4 to 6 and 35 hours for form levels 7 to 9.[48] A minimum number of lessons per year are specified for 'Danish' and 'Mathematics' for all form levels and 'History' for the 3rd to the 9th form. For other subjects, a guide line number of lessons are set for each form level. The teaching includes subject-divided lessons as well as additional time for assisted learning and support of the subject-divided lessons during the remainder of the school day. Within the overall teaching time, the school leader is to ensure that stu-

47 Including 9 municipalities with so-called KTO agreements, which can be considered as local agreements based on the principles of the 2008 working hour agreement.

48 This includes an offer of homework assistance, which until the next national election is not compulsory. If the students period choose to opt out of the offer of homework assistance in this transition, the resulting school week will be 28 hours for pre-school to the 3rd form, 30 hours for the 4th to the 6th form and 33 hours for the 7th to the 9th form (The Ministry of Education 2014b).

dents participate in physical exercise and activity each day to an extent corresponding to an average of 45 minutes per day (The Ministry of Education 2014b).

The remaining this chapter is based on the reviewed studies. The following subthemes guide and structure the presentation:

- Allocation of teacher resources to students
- Matching resources to individual students' learning needs
- Organisation of teaching and learning environment
- Organisation of student learning time
- Use of school facilities and materials, e.g. ITC.

5.1 Overview of studies

For a description of the information presented in the table below, see Chapter 3.1.

Table 5.5 Key information about the reviewed studies. Studies of Resource Utilisation

Ref. Id	Author(s) and publication year	Type of study	OECD Theme	Subtheme	Data type	Type of resources	Unit of analysis (N)	Data year	Study of Policy Initiatives?	Causal ambition?
[6]	Calmar Andersen, S. & Søren C. Winter (red.) (2011) *Ledelse, læring og trivsel i folkeskolerne*	RR	RU RM	RU3 RM2	QT-R-S	HU	ST(4311-83381) SC (375-682) TE(1130)	2008-2011	No	Yes
[7]	Præstgaard Christensen et al. (2014) *Effekten af it-støtte på elevers læsefærdigheder*	RR	RD RU	RD3 RU5	QT-R-S	PH	ST (490)	2010-2011	Yes	Yes
[10]	Bøgh Andersen et al. (2014) *How Does Public Service Motivation among Teachers Affect Student Performance in Schools?*	RA	RU RM	RU1 RM2	QT-R-S	HU	ST (5631) TE (694) SC (85)	2009-2011	No	Yes
[12]	Strandbjerg Nielsen et al. (2011) *Skår i (arbejds-)glæden? Intrinsisk motiviation og elevplaner i folkeskolen*	RA	RU	RU1	QT-S-Q-IV	HU	TE(10-257)	2009	Yes	Yes
[203]	KL et al. (2010) *Specialundervisning i folkeskolen*	NG	RD RU	RD1 RU2	QT-R-S-IN	HU TP	MU (12) SC (295)	2008-2009	No	No
[210]	Wittrup & Bogetoft (2011) *Effektivisering i folkeskolen. Muligheder og metoder*	NG	GO RU	GO1 GO5 RU1	QT-R-	HU	SC(704-1046)	2007-2009	Yes	Yes
[211]	Teglgaard Jakobsen et al. (2012) *Økonomi og faglig kvalitet i folkeskolen – hinandens modsætninger?*	NG	GO RU	GO5 RU1	QT-R	HU	SC(1036)	2007-2009	Yes	Yes
[224]	Bækgaard & Teglgaard Jakobsen (2011) *Ekskluderende specialundervisning*	NG	RU RM	RU3 RM2	QT-R	FI HU	ST(600000) MC (98)	2007-2009	Yes	Yes
[226]	Søndergaard Pedersen, H. & Teglgaard Jakobsen, S. (2012) *Kommunernes organisering og styring på specialundervisningsområdet*	NG	RD RU	RD1 RD6 RU2	QT-S	FI TP	MC(70)	2011	No	No
[254]	Danmarks Evalueringsinstitut, (2014) *TALIS 2013. OECD's lærer- og lederundersøgelse*	NG	RD RU RM	RD4 RD5 RU3 RM2 RM3	QT-S	HU	TE(164-183)	2013	No	No

[288]	Rambøll (2010) *Udgifter til folkeskolen. Analyse af to kommuner*	CI	GO RD RU	GO5 RD3 RD6 RU1 RU4	QT- QL-R	FI HU PH TP	MC(2)	2008-2010	No	No
[296]	EVA (2009) *Særlige ressourcepersoner i folkeskolen*	NG	RD RU	RD4 RU2	QT- QL-S	HU	SC(597) SC (8) MC(8)	2009	No	No
[298]	EVA (2009) *Undervisningsmidler i folkeskolen*	NG	RU	RU2 RU5	QL-IN	TP	MC(11) SC(11)	2008	No	No
[316]	Fritjof Krassel & Heinesen (2014) *Class- size effects in secondary school*	RA	RU	RU1	QT	HU	SC (482) ST (46267)	2003 - 2006	Yes	Yes
[317]	Browning and Heinesen (2007) *Class Size, Teacher Hours and Educational Attainment*	RA	RU	RU1	QT-R	HU	SC(1118) ST(403969)	1985 - 2003	Yes	Yes
[318]	Calmar Andersen et al. (2014) *Undersøgelse af effekten af tolærerordninger*	CI	RU	RU1	QT-R-S-QL	HU TP	MC(5-18) SC (221)	2012-2013	Yes	Yes
[319]	Astrup Bæk (2014) *Kommunernes økonomiske implementering af folkeskolereformen*	RR	GO RU	GO2 RU4	QT-S	FI HU TP	MC(75)	2014	Yes	No
[323]	Heinesen (2010) *Estimating Class-size Effects Using Within-school Variation in Subject-specific Classes*	RA	RU	RU1	QT	HU	SC (315) ST (7387)	2001-2004	Yes	Yes
[330]	Rambøll (2011) *Evaluering af undervisningsassistentordningen*	CI	RD RU	RD4 RU1 RU2	QT-R-S-QL	HU TP	MC(22-28) SC(55-71) ST(553-610)	2009-2011	No	Yes
[331]	Rambøll & Boston Consulting Group (2014) *Anvendelse af digitale læremidler - effektmåling*	CI	RU	RU5	QT-S-QL-IV	PH	SC(477) TE(1550)	2012-2013	Yes	Yes
[345]	Bogetoft & Wittrup (2011) *Productivity and education*	RA	GO RU	GO1 GO5 RU1	QT	HU PH	ST(330-1400)	2007-2009	Yes	Yes
[350]	Egelund, (2009). *TALIS. Lærere og skoleledere om undervisning, kompetenceudvikling og evaluering(...)*	NG	RD RU	RD4 RD5 RU3	QT-S	HU	SC(115) TE(1717)	2008	No	No
[353]	Hoest et al. (2013) *Increasing the admission rate to upper secondary school*	RA	GO RU	GO5 RU1	QT-R	TP	ST(15013-201546) SC(262-998)	2002-2007	Yes	Yes
[379]	Baviskar et al. (2014) *Kommunernes omstilling til øget inklusion pr. marts 2014*	LG	GO RD RU RM	GO2 RD1 RD6 RU2 RM3	QT-R-S-QL-IN	FI HU TP	MC(12) SC(68)	2010-2014	Yes	No
[380]	Calmar Andersen et al. (2014) *Indledende analyser af forsøg med modersmålsbaseret undervisning*	RR	RD RU	RD6 RU1	QT-R-S	HU TP	SC(120) ST(2608)	2013-2014	Yes	Yes
[381]	Rambøll (2014) *Erfaringsopsamling om implementering af klasseindsatser. Forsøg om modersmålsbaseret undervisning*	CI	RD RU	RD6 RU2	QT	TP	SC(10)	2013	No	No
[384]	Lynggaard (2013) *Lærernes arbejdstidsregler*	RR	RU	RU1	QT-R	HU	SC(699)	2007-2011	Yes	Yes
[413]	KL (2012) *Rapport om KL's strategiprojekt om effektiv anvendelse af lærernes arbejdstid*	CI	RU	RU1	QT	HU	MC(35) SC(450) TE(148000)	2011-2012	No	No
[414]	KL (2014) *Inklusion/segregering og tilvalg af folkeskolen*	CI	RD RU	RD2 RU1	QT-R	FI HU	MC (98)	2007-2013	Yes	Yes
[461]	Mikkelsen et al. (2014) *Managing employee motivation*	RA	RU RM	RU1 RM2	QT-S	HU	TE(1190) SC(32)	2010-2011	No	Yes
[464]	Rangvid & Lynggard (2014) *Specialskoleelevers resultater ved skolegangens afslutning og 5 år senere*	RR	RU	RU2	QT-R	TP	ST(3080-220000)	2002-2012	No	Yes

[468]	Humlum & Smith (2015) *Long-Term effects of School Size on Students' Outcomes*	RA	RU	RU1	QT-R	HU	ST(605125)	1986-2004	Yes	Yes

Notes: The list only includes studies with a highly satisfactory, satisfactory or somewhat satisfactory methodological quality according to the scientific norms for the applied research design. Note that some of the studies with (explicit or implicit) causal ambitions provide satisfactory descriptive inferences, though not satisfactory causal inferences.

Type of study: RA = Research articles and literature reviews (peer reviewed); RR = Research reports and books (peer reviewed); NG = National government evaluations and reports; LG = Local government evaluations and reports; CI = Evaluations etc. by consulting firms or interest organizations; OT = Other studies.

OECD Theme: GO = Governance; RD = Resource distribution; RU = Resource utilisation; RM = Resource management.

Sub-theme: GO1 = Policy priorities/differences in spending per student across regions or type of municipality; GO2 = Implementation of policies; GO3 = Responsibilities across levels of the school system; GO4 = Sources of revenue; GO5 = Benchmarking of efficiency or effectiveness/ best practices.

RD1 = Distribution of resources between administrative levels and resource types; RD2 = Distribution of resources and students to individual schools; RD3 = School structure and distribution of school facilities and materials, e.g. ICT; RD4 = Distribution of teacher resources; RD5 = Distribution of school leadership resources; RD6 = Programmes targeted to specific students, e.g. resource distribution based on socio-economic criteria.

RU1 = Allocation of teacher resources to students; RU2 = Matching resources to individual students' learning needs; RU3 = Organisation of teaching and learning environment; RU4 = Organisation of student learning time; RU5 = Use of school facilities and materials, e.g. ICT

RM1 = Monitoring resource use (audit system etc.); RM2 = Outcome-based planning; rewards, sanctions and other incentives; RM3 = Capacity building for resource management; RM4 = Transparency and reporting on outputs and costs.

Type of resources: FI = Financial; HU = Human; PH=Physical TP= Targeted programs

Data type: QT = Quantitative; QL = Qualitative; S = survey; R = registers; O= Observations; IV = Interviews; TX = Text Analysis.

Unit of Analysis: ST = Students; TE = Teachers; SC = Schools; MU = Municipalities; NA = National level.

5.2 Studies of Allocation of teacher resources to students

Several of the identified studies focus on different aspects of the allocation of teacher resources to students.

Framework for utilisation of teachers' working hours

Two of the studies found investigate the practical implications and the potential effect on student performance of the former 2005 and 2008 working hour agreements. Firstly, a study by LGDK based on local resource allocation models and working plans for nearly 15,000 teachers in 450 schools in 35 municipalities focuses on variations in the number of weekly teaching hours per teacher (KL 2012). Although the largest Danish municipalities are not included, the study is likely to be fairly representative of the municipalities in Denmark in 2011/2012 at the time the study was conducted. The study finds that teachers on average spend 39.6 per cent of their working time on teaching and 60.4 per cent on various non-teaching activities, including preparation. However, considerable variation was found across municipalities and schools, including a difference between municipalities of up to two teaching hours per week and a 3.7 teaching hours difference between the 10 schools with the highest number of teaching hours per week and the 10 with the lowest (KL 2012). In addition, the average number of teaching hours per week in municipalities following the 2008-agreement was lower than the average in municipalities following the 2005-agreement.

The common understanding of LGDK and the teachers union was that the 2008 agreement would create a framework for improvement of the quality of teaching (Lynggaard

2013). A quasi-experimental study of student performance at the school-leaving exams comparing the change in student performance in schools located in municipalities changing to the 2008 agreement, with schools in municipalities continuing under the 2005 agreement, concludes that, on average, students do not perform better in municipalities in which teachers work under the 2008 agreement (Lynggaard 2013). Underneath the average non-findings, two opposite effects on student performance are found, depending on the length of the parents' education: positive effects of the 2008 agreement are found in schools where the parents have a short education, whereas negative effects are found in schools where the parents have a long education (Lynggaard 2013).

The teaching profession involves many different tasks, and on average around 40 per cent of the work time in 2011-2012 was spent on actual teaching (KL 2012). The variation across municipalities was two teaching hours per week. There is no correlation between time spent on teaching and school size (KL 2012). Cross-municipal variations in the number of teaching hours provided per class is related to political choices regarding service level rather than to the amount of work time that the average teacher in a municipality spends on teaching.

Experiences with the new 2014 framework for utilisation of teachers working hours are still sparse, and the long-term effects are a question for the future. Firstly, an evaluation of the economic implementations of the reform indicates that the municipalities implement the new regulation as intended by increasing the number of hours taught per teacher. So far, however, no convergences across municipalities are observable, and the municipalities with comparatively high rates of teaching hours per teacher before the summer of 2014 continue to have a relative high rate (Astrup Bæk 2014).

Teacher resources, class size and school size

Two studies endeavour to establish the effect of teachers' time spent on teaching on student achievement. (Wittrup & Bogetoft 2011, Bogetoft & Wittrup 2011) use data envelopment analysis (DEA) to estimate the schools' production frontier. Keeping input fixed, the study estimates a potential production increase of 13 per cent. Hence, according to the model simply reallocating input can increase output. As a result, the allocation of more of the teachers' time to teaching is beneficial for student achievement. The DEA method does not in itself support causal conclusions, and the result should thus be viewed in this light. One drawback is that the results are valid only if schools are allowed to be compared across municipalities. If schools are compared to schools in the same municipality, the production increase potential drops to 0.6 per cent, i.e. the difference between the individual school and 'best practice' is much smaller within the municipality than when compared to schools in other municipalities. (Teglgaard Jakobsen et al. 2012) investigate the effects on student achievement of "structural conditions" relating to teacher characteristics, class and school size, and

also find an association between time allocated to teaching and student achievement, in addition to associations between teachers' sickness absence, students per teacher, teachers' teaching hours per student and student achievement. The study does not address the possible endogeneity of the explanatory variables. Thus, the estimated associations could be spurious.

Another aspect of the allocation of teacher resources to students is the class setting in which the teaching takes place. A raw class size measure indicates the number of students in the class. (Heinesen 2010) and (Krassel & Heinesen 2014) study the effect of this raw class size. One issue related to merely estimating the effect of the raw class size measure is that large classes can be taught by more than one teacher. This reduces the *de facto* class size. The studies (Rambøll 2011) and (Calmar Andersen et al. 2014) evaluate experiments using more than one teacher. The studies (Teglgaard Jakobsen et al. 2012) and (Browning & Heinesen 2007) control for both class size and students per teacher/students per teacher hours respectively. Using within-school variation in class size in subject-specific classes (French classes) (Heinesen 2010) estimates a negative effect of class size on student achievement. The larger the number of students in a class, the poorer the students perform at the school-leaving examinations. The estimated effect sizes, i.e. effect on standardized examination marks, range from 0.18 to 0.24 given a class size reduction of 8. This is similar to what is found in the international literature. In addition, the study finds effect heterogeneity, as the achievement of boys and students with a disadvantaged socio-economic background is most affected by the size of the class. (Krassel & Heinesen 2014) estimate class-size effect in an optional 10^{th} grade using a regression discontinuity design combined with school fixed effects. The estimated effect size is around 40 per cent of the estimate found in (Heinesen 2010), and the difference is likely explained by the different characteristics of the optional 10^{th} grade. Contrary to (Heinesen 2010), (Krassel & Heinesen 2014) do not find any effect heterogeneity, which can possibly be explained by the highly selected group of students in 10^{th} grade.

Based on administrative panel data for all students starting 8^{th} form between 1985 and 1992, (Browning & Heinesen 2007) find that a reduction in students per teacher hour or a reduction in class size in the Folkeskole increases both the number of years of further education completed and the probability of completing upper secondary education. Both with respect to completion of upper secondary education and years of completed further education, the effect of a reduction in students per teacher hour is larger than the effect of a reduction in class size (Browning & Heinesen 2007).

At a more aggregated level, (Humlum & Smith 2015) investigates long-term effects of *school* size and find a robust but numerically fairly small positive relationship between school size and alternative measures of long-term success in the educational system and the labour market. Both fixed-effects and an IV approach are used to estimate the

effect of school size. With respect to the fixed effects, the authors rely on school and sibling fixed effects. With respect to the IV, the authors use natural population variation in the residential catchment areas and school openings and closures to instrument actual school size. The authors use the following long-term outcomes: Form nine exit exam marks, enrolment in or completion of upper secondary education, completion of upper secondary education, being out of the labour market (inactivity), and earnings at age 30. For 9th form final exam marks, a *negative* effect of school size is found in one of four models, while the estimates are insignificant in the remaining three models. The effect of school size on the probability of completing upper secondary education varies between significant *positive* estimates and insignificant estimates. The authors do not emphasize the zero-finding, as it is based on the school closure instrument, which is rather weak. With respect to enrolment or completion, the results are similar, i.e. a predominantly positive effect of school size exists. The probability of being out of the labour market (inactivity) is not related to school size. For earnings at age 30, the estimates for school size generally have *positive* signs, ranging from being insignificant to being significant at the 0.05 level. The authors sum up by concluding that larger school are not harmful to students' longer-term outcomes. Rather, the opposite seems to be the case, as students attending larger schools have greater success in the education system and in the labour market. The authors recognize, however, that these findings are distinct from earlier studies that typically find no systematic relationship between school size and student attainment. With respect to effect heterogeneity, the authors find that especially boys and children from families with low educational level benefit from larger schools (Humlum & Smith 2015).

Apart from the importance of teacher presence on student performance, the teachers' motivation may also have an impact on student performance. This is documented by the studies (Bøgh Andersen, Heinesen & Holm Pedersen 2014), (Strandbjerg Nielsen, Vang Jakobsen & Bøgh Andersen 2011) and (Mikkelsen, Jacobsen & Bøgh Andersen 2014). (Bøgh Andersen, Heinesen & Holm Pedersen 2014) deploy the term Public Service Motivation (PSM) and investigate the relationship between teachers' PSM and student performance using combined survey and registry data for the period 2009-2011. Comparing the performance of individual students in subjects taught by teachers with high PSM with their performance in subjects taught by teachers with lower PSM, the study finds a significant positive effect of PSM, i.e. being taught by a teacher with higher PSM implies higher exam marks on average. A study combining teacher survey and interview data investigates the effects of student plans on teacher motivation (Strandbjerg Nielsen, Vang Jakobsen & Bøgh Andersen 2011). On average, the teachers regard student plans as a control mechanism. However, variation is large. The estimation results show that intrinsic motivation among teachers is high, if student plans are regarded as a support mechanism and vice versa. The estimation results are supported by the anecdotal evidence: Teachers' stance on student plans and intrinsic mo-

tivation are correlated. Inexperienced teachers and teachers who only fill out few student plans are more in favour of student plans. The same applies if the teachers regard the student plans as fulfilling their needs for autonomy, competence and affiliation. Similar findings are found in (Mikkelsen, Jacobsen & Bøgh Andersen 2014). In addition, (Mikkelsen, Jacobsen & Bøgh Andersen 2014) document a relationship between school leaders' enforcement of the student plans and teachers' intrinsic motivation. The authors classify enforcement methods based on survey responses and rank them as either soft, mixed or hard. Soft is either "Enter into dialogue with teachers about how to use student plans" or "Make suggestions to teachers about student plans". Hard is either "Monitor whether teachers use student plans" or "Demand that teachers use student plans" while mixed is a combination of the two. The authors find that teachers experiencing "hard" or "mixed" enforcement have lower levels of intrinsic motivation compared to teachers experiencing "soft" enforcement. When controlling for teacher perception of the student plans, the negative relationship between intrinsic motivation and enforcement method is not statistically significant for "hard" and "mixed" enforcement. However, if the teachers perceive student plans as a control mechanism their intrinsic motivation is low regardless of the enforcement method (Mikkelsen, Jacobsen & Bøgh Andersen 2014).

Teaching assistant resources

(Rambøll 2011) uses a combination of quantitative and qualitative data to study the effect of using teaching assistants to assist the teacher in the class during the school years 2009/2010 and 2010/2011 (across different forms). Based on the quantitative data, the study finds – based on self-assessments and without using control groups – that the use of teaching assistants is especially beneficial for the wellbeing and performance of students from a disadvantaged socio-economic background. However, the use of teaching assistants has limited effects on all the students collectively. The qualitative data, in contrast, suggest that teacher assistants have some positive spill-over effects on students from an advantaged socio-economic background. In the same vein, (Calmar Andersen et al. 2014) reports the findings of an experiment using multiple teachers in the 6th form. In contrast to (Rambøll 2011), the experiment was conducted as a RCT across 18 municipalities. The study uses national test scores in Danish and maths as outcomes in addition to self-reported wellbeing measures both before (2012) and after (2013) the experiment. Three types of extra teachers were used in the experiment: Traditional teachers, other non-teacher-educated resource persons (with less preparation time but more in-class time) and specialists guiding the teachers and participating in the teaching occasionally. The study finds positive effects of the first two kinds of extra teachers on reading. However, an extra teacher (regardless of the type) has no effect on the students' performance in maths. Interestingly, the study finds that the second, non-teacher-educated type of extra teacher has a stronger effect on students' reading skills compared to the first type, namely the educated extra teacher. In

addition, the presence of an educated extra teacher mainly affects the girls. The third type of teacher only has an effect on students' reading skills when one or more students with a psychiatric diagnosis attends the class. Overall, additional teachers do not seem to have an effect on students' wellbeing (Calmar Andersen et al. 2014).

The studies (Rambøll 2011) and (Calmar Andersen et al. 2014) do not consider the cost of running the experiments of additional teachers. Hence, the effectiveness of the initiatives cannot be assessed. The study (Rambøll 2010), which is discussed in more detail below, indicates that the use of extra teachers (social educators) can explain some of the differences in costs between municipalities.

As indicated above, traditional teachers are not the only type of personnel resources allocated to students. As described in Section 4.5, a wide range of personnel with specific competences and skills are also used (Danmarks Evalueringsinstitut 2009b)[49]. On average, 1.74 teacher man years are allocated to special resource persons. According to (Danmarks Evalueringsinstitut 2009b), the use of special resource persons is based on an understanding of knowledge transfer throughout the school.

Earlier on, local resource personnel also assisted students with respect to upper secondary education counselling. However, by August 2004 the Danish Guidance Reform (DGR) had been implemented. The reform shifted the guidance task from the schools to Youth Guidance Centres (UU). The effect of this reform is investigated in (Hoest, Jensen & Nielsen 2013) and was found to benefit the enrolment chances for immigrant students. See Section 3.6, page 90, for further details).

5.3 Studies of Matching resources to individual students learning needs

The studies identified as concerning the matching of resources to individual students' learning needs cover special needs education, inclusion, immigrants/bilingual students and special resource persons. As documented in the reported studies, special needs education/inclusion are areas in which large changes have been implemented in recent years.

As described in Section 4.2, the financial responsibility of 'included' special needs education in normal classes has to a large extent been decentralized to the individual schools, whereas budgets for segregated special needs education in either special classes in ordinary schools or in special schools generally remain with the municipality (Søndergaard Pedersen & Teglgaard Jakobsen 2012). For more details, see Section 4.2. The study further documents that the decision process leading to special needs education is governed by permanent visitation boards in 84 per cent of the municipalities. The member composition of the board differs across the municipalities, but often a

[49] See Section 4.5 for further details.

representative from the pedagogical-psychological advising unit (PPR) (96 per cent) and the school director (60 per cent) participates. In addition, these two actors are regarded as the ones having the most influence on the process. With respect to efficient use of resources, a survey-based study of school leaders in 12 municipalities in 2010 pointed to a problem with visitation boards, as they did not have any financial responsibility. (KL 2010) also pointed to centralized budgets for special needs education as a problem, as this did not incentivize schools to choose inclusion over segregation. In addition, (KL 2010) identified a lack of competences with respect to inclusion as a barrier. Only few municipalities had systemized the competence development on inclusion competences. Finally, (KL 2010) pointed to the school's use of the PPR unit as being somewhat unsystematic. (KL 2010) suggested that PPR should be used more strategically and frequently.

Given the legal changes in 2012, the findings of segregated special needs education by (Bækgaard & Teglgaard Jakobsen 2011) are likely not to be completely applicable today. Nevertheless, (Bækgaard & Teglgaard Jakobsen 2011) find that segregated[50] special needs education is more likely to take place if the students have a social disadvantaged background, are male, and if budgets are centralized. Controlling for social background, ethnicity is of no importance. In addition, neither the municipalities' financial opportunities nor the school size affect the probability of out-segregated special education (Bækgaard & Teglgaard Jakobsen 2011).

As reported in Section 4.2, (Baviskar et al. 2014) find that inclusion has become more prevalent in recent years. The study is based on qualitative and quantitative data from 12 municipalities. The change in type of special needs education is affected by the changes in financial incentives and demarcation of special needs education. The study reports change from 93 per cent inclusion of the students with special education needs in ordinary classes in 2010 to 96 per cent in 2014. In contrast to (KL 2010), (Baviskar et al. 2014) finds that all 12 participating municipalities provide a significant amount of resources for competence development in special needs education among teachers. Finally, the pedagogical-psychological advising unit (PPR) has undergone organizational changes, as decentralisation has taken place. One aspect of this is that the importance of the visitation process by the PPR has been weakened, as the financial responsibility has been shifted to the schools (Baviskar et al. 2014).

At the municipal level, the degree of inclusion in the Folkeskole does not seem to affect the propensity of parents to choose a private school instead of the Folkeskole (KL 2014). Neither the degree of inclusion nor class size, expenses per student, grades or sickness absence of teachers seem to be correlated with the parents' choice between

[50] Segregated special education includes students in special classes and special schools. Special education in ordinary classes is not included.

public and private schools (KL 2014). However, this study only conducts bivariate analyses, and hence identification is weak.

(Rangvid & Lynggard 2014) investigate the outcomes of students in segregated special needs education and find at an overall level that special *school* students attend the 9th grade final exam less frequently compared to special *class* students in ordinary public schools, also when controls are included for the reason of special education. Five years after leaving lower secondary school, special school students, compared to other students, seem to have a higher degree of marginalisation with respect to education, labour market and the probability of being an early age pension recipient. The study utilises Statistics Denmark's special education register, which was established in 2011/2012 and registers whether a student receives special education in an ordinary public school, attends a special class in an ordinary public school or if the student attends a special school. In addition, the register contains information on reason for special education, the most common reason being "general learning difficulties". Unfortunately, 40-50per cent per cent of the students are recoded as having "other" or "not provided" as the reason for receiving special education. The study investigates special school student life after special school at two points in time, namely around the age they finish lower secondary education (15-17 years old) and around the time the students are 21 years old (Rangvid & Lynggard 2014). At the time of leaving lower secondary education special school students attend the 9th grade final exams less frequently compared to special class students (even with controls including the reason for special education). Looking at post lower secondary education, on the one hand fewer special school students are attending an education one year after completion of 9th form relative to special class students. On the other hand, there is no statistical difference between special school students and special class students, if post lower secondary education comprises all types of education. In the analyses of the 21-year-olds – based on a comparison group of all students with similar background characteristics, as the authors do not know who attended special classes – special school attendance seems to be correlated with a higher degree of marginalisation with respect to education, labour market participation and whether the special school student is a recipient of early age pension. There are no differences with respect to crime and health. The authors state that the results should not be interpreted as the effect of special school attendance. If the selection into special schools depends on more than what is in the control set (and the authors believe that it does), then the differences could simply be due to selection bias.

As discussed above, a range of special resource persons are used in the public schools (Danmarks Evalueringsinstitut 2009b). Among these resource persons are resource persons targeting students with special learning needs. One example is the AKT in-

structors[51], who focus on students with behavioural, contact and wellbeing difficulties and issues. In relation to this, it is worth mentioning the study (Rambøll 2011), which documented that the use of teaching assistants benefits students from a socially disadvantaged background. Another kind of resource targeted children with special needs is described in {{298 Danmarks Evalueringsinstitut 2009}} and discussed in further detail below. The study describes how ITC tools can help students with special reading difficulties (but not without challenges – see below).

(Calmar Andersen, Humlum & Brink 2014) reports the findings of a RCT with mother tongue-based teaching to 4th formers conducted in 2013-2014. 2,608 students in 120 schools participated in the experiment. Effects are measured using national tests in 2nd and 4th form. The treatment consisted of inclusion of Danish as a second language in maths teaching, additional teaching in common receptive language ability and/or extra teaching in Danish. The study finds that additional teaching in Danish and common receptive language ability has positive effects on reading ability. Contrary to the goal of the intervention, the study finds that especially single language children benefitted from the experiment. The inclusion of Danish as a second language in maths teaching did not influence reading ability. This is maybe not surprising, as increased reading ability would be an indirect effect of maths teaching. Unfortunately, it is not possible to quantify the direct effect on maths ability, as too few students took the voluntary test in maths in the 4th form. The study has high validity and reliability but does not provide any information about costs and hence effectiveness of the intervention cannot be assessed.

5.4 Studies of Organisation of teaching and learning environment

Being concerned with the resource utilisation, this chapter has to a large extent excluded studies on the teaching and learning environment. Two exceptions from this are the studies (Egelund 2009) and (Danmarks Evalueringsinstitut 2014), which are discussed in detail in Sections 4.5 and 4.6. Evaluations are generally seen to have fairly little influence on school practices, and evaluations are utilised to a lesser extent in Denmark compared to other TALIS countries (Egelund 2009). Danish teachers to a lesser extent than teachers in other TALIS-countries find that their requests for supplementary education are met by school leaders and, especially, training in the teaching of students with special needs is needed (Egelund 2009). With respect to the organisation of the teaching environment, (Danmarks Evalueringsinstitut 2014) finds that Danish teachers co-operate with fellow teachers to a lesser extent (compared to other TALIS countries) on establishing common standards for evaluations and for evaluation of

[51] AKT instructors have had supplementary training and courses in advising and guiding fellow teachers to handle students challenged by behavioural, social contact or wellbeing issues

progress in student performance. In fact, feedback given to teachers is mainly from other teachers and less frequently from the school leaders.

Another study finds no significant association between supplementary education of teachers and students' educational performance, while supplementary education of teachers has a positive effect on students' wellbeing (Calmar Andersen & Winter 2011). However, if the management emphasizes teaching skills in the hiring process there is a tendency towards higher student performance and wellbeing. Unlike for teachers, school leaders' training does seem to matter. Thus, students perform better and parents find that their children have a higher level of wellbeing at schools where the school leaders have received supplementary management training (Calmar Andersen & Winter 2011). However, the duration of the training is not important. Moreover, the wellbeing of teachers is lower in schools where the management has undertaken supplementary training of a longer duration. The authors suggest that this may be due to the school leaders' absence from the school (due to training), but this hypothesis is not supported empirically.

Collaboration with external institutions seems to be negatively associated with student performance and wellbeing (Calmar Andersen & Winter 2011). In contrast, collaboration among teachers and frequent discussion of teaching-related topics tend to be accompanied by higher student performance and wellbeing.

5.5 Studies of Organisation of student learning time

The three identified studies on the organisation of student learning time are rather diverse in nature. The first study, (Rambøll 2010), is a descriptive comparative study between two municipalities. The second study, (Astrup Bæk 2014), investigates the changes in the organisation of student learning time brought about by The Folkeskole Reform in 2014. The third and final study, (Calmar Andersen, Humlum & Brink 2014), evaluates a RCT consisting of changes in the organisation of the student learning time.

Using the approach of most similar system designs, (Rambøll 2010) investigates explanations of differences in expenses per student between two otherwise similar municipalities. One municipality has a low school expenditure level; the other has a high level in the period 2008-2010. The study finds that some of the differences in expenses can be attributed to differences in the organisation of the student learning time. Specifically, the study finds that the following factors related to the organisation of the student learning time are likely to drive expenses: Weekly number of teaching hours, amount of teaching co-taught by leisure-time teachers, share of students receiving special needs education and number of classes per cohort.

The study reported in (Astrup Bæk 2014) investigates the economic consequences of the Folkeskole Reform of 2014, using survey data obtained among controllers in the municipalities. The reform gave municipalities a range of tools for meeting the targets of reform. The study finds that the municipalities do indeed use these tools. The reform presumed a minimum average number of teaching hours of 733 per year in the municipalities, but the survey uncovers a tendency to raise teaching hours independently of the pre-reform level. Hence, municipalities providing many teaching hours before the reform also provided many (and above the required minimum number of) hours after the reform.

As pointed out in Section 5.3, (Calmar Andersen, Humlum & Brink 2014) finds that additional teaching in Danish and common receptive language ability aimed at bilingual students has positive effects on reading ability in the 4th form. Contrary to the goal of the intervention, however, single language children benefit the most from this reorganisation of student learning time.

5.6 Studies of Use of school facilities and materials, for instance ITC

The review process has identified three studies on the use of school facilities and materials. The three studies, (Danmarks Evalueringsinstitut 2009a), (Rambøll & BCG 2014) and (Præstgaard Christensen et al. 2014) concern the use of ITC and digital learning materials in the Folkeskole.

(Danmarks Evalueringsinstitut 2009a) is a qualitative descriptive study conducted across 11 schools in 11 different municipalities. The purpose of the study is to gather information about schools' and municipalities' experiences regarding the use of ITC in school. The study is based on a wide range of interviews and dialogue meetings in combination with qualitative data from a self-evaluation tool, but does not provide detailed information on case selection and on how the qualitative data are gathered and handled. The study finds that teachers and school leaders have reasonable access to ITC resources but at the same time experience operational and technical issues. The responsibility for operation and technical support is often placed centrally in the municipalities, which leads to slow error recovery and inefficient use of ITC resources. In addition, the teachers indicate that they have participated in ITC-related courses, but they also indicate that this has not led to a more qualified teaching practice with inclusion of ITC. Hence, the teachers ask for additional competence building with regard to the use of ITC resources in their completion of teaching. The issue is exemplified by the use of ITC to target students facing reading and writing difficulties. For the provided resources to work (e.g. the ITC backpack initiative), the teachers require competences in how to use the resources and how to guide the students. Another example is that teachers indicate that they are aware of the existence of digital teaching resources but lack a full overview of the resources. Furthermore, they have difficulties evaluat-

ing the quality of the ITC resources available. Finally, the study finds that ITC-supported knowledge sharing primarily takes places at the administrative level. The expert group assesses that there is a large unused potential for additional use of ITC resources (Danmarks Evalueringsinstitut 2009a).

(Rambøll & BCG 2014) evaluates the use of digital teaching materials based on data from teacher and school leader surveys in combination with teacher interviews. Overall, the study concludes that the use of digital teaching materials is widespread in the Folkeskole and – with uncertainty – frees teacher resources, and that the use of digital teaching materials is beneficial for differentiation of teaching to individual student needs and for motivation of students. It is estimated that approximately 320 DKK per student per year is spent on digital teaching materials altogether at the school and municipal levels, and indications of economies of scale are reported when purchasing of digital teaching materials is coordinated at the municipal level. On average, digital teaching materials are used in 40 per cent of all classes, though with large variations across schools, teachers and subjects. Regarding the effects of using digital teaching materials, the study is aware of the methodological limitations and potential overreporting bias stemming from effects being measured as *perceived* effects rather that real effects and a potential overrepresentation of teachers with a positive attitude towards the use of digital teaching materials. Bearing these important limitations in mind, the reported results indicate that digital teaching materials free teacher resources, especially with regard to preparation of teaching. The reported results also indicate, that teachers perceive the use of digital teaching materials to be beneficial for differentiation of teaching to individual student needs and for motivation of students, while to a lesser extent being beneficial for student-to-student learning and for including student every day life and experiences from the real world in teaching. Finally, the study points to ITC infrastructure at the schools and teacher experiences/competences in using digital teaching materials as important moderators for achieving potential beneficial effects (Rambøll & BCG 2014).

In relation to the effects of the use of ITC resources in teaching, (Præstgaard Christensen et al. 2014) reports the results of a randomized control trial and finds the availability of text-to-speech software to have a positive effect on reading comprehension and text decoding in the national tests in reading. The experiment was conducted in one municipality across 11 schools. The treatment was the provision of text-to-speech software to the 4^{th} to 6^{th} forms, with randomisation carried out at both the school and student level. In total, 490 students participated in the experiment in the years 2010 to 2012. The outcome variable of the study is achievement in the national tests in reading, comprising the reading components text comprehension, text decoding and receptive language ability. The availability of text-to-speech software is estimated to affect reading comprehension and text decoding positively, while there is no effect on receptive language ability. The effects are heterogeneous, as the availability of text-to-

speech software seems to benefit students with a weak or average reading ability the most (Præstgaard Christensen et al. 2014).

5.7 Summary and synthesis of knowledge regarding resource utilisation

A key resource in the schooling sector is the teachers. Though traditional teachers are not the only personnel group used in public schools, the importance of the teachers is illustrated by the fact that many of the studies regarding resource utilisation concern the provision and effects of teacher resources. The reviewed studies generally find that teachers are most valuable when they spend their time on actual teaching, and that a positive relationship exists between the time allocated to teaching and student achievement. In addition, the student-to-teacher ratio has an effect on student achievement, both with respect to raw class size and with respect to the *de facto* class size (when more teachers are used at the same time in the carrying out of teaching). More studies find a negative effect of class size on student achievement, whereas at a more aggregated level school size is found in one study to have a positive long-term effect on students' enrolment in and completion of upper secondary education as well as earnings at age 30.

More studies show that teacher motivation is an important asset, and that the motivation is affected by the leadership style of the school leader as well as the way teachers perceive policy initiatives, such as student plans. When it comes to student achievement at the final exams in 9th form, students taught by teachers with a high level of Public Service Motivation perform better. Other studies find a positive effect of extra teachers on student reading skills in national test scores in the 6th form.

Studies on the matching of resources to individual students' learning needs, revealed large changes in special needs education in recent years. Inclusion of students with special educational needs has become much more prevalent, and segregation to special education has decreased in the wake of changes in financial incentives and organizational changes in the pedagogical-psychological advising unit (PPR). The increased use of inclusion in public schools does not seem to have affected the parents' choice between public and private schools, but the evidence is somewhat weak. Some evidence is also provided that special *class* students do better than special *school* students with respect to participation in the final exams in 9th form. Segregated special education students also do poorer in the longer run, with a higher tendency to be marginalised. This, however, cannot be interpreted as an effect of the special school education itself. Difficulties with respect to meeting the needs of immigrant/bilingual students were also found. One study showed that part (but not all) of the immigrant-native test score gap can be explained by immigrants choosing poorer schools, whereas another study documented positive effects of additional teaching in common receptive language and additional teaching in Danish aimed at bilingual students. However, contra-

ry to the goal of the intervention, especially single language children benefitted from the experiment.

Only two studies were found to be relevant in relation to the organisation of teaching and learning environment, but they showed that teacher evaluation is often provided by other teachers and less frequently by the management. Three studies regarding the organisation of student learning time documented how weekly teaching hours is a factor contributing to cross-municipality spending differences, that the school reform of 2014 led to an increase in planned teaching hours, and that the provision of additional teaching hours can be beneficial for student achievement.

The studies of the use of school facilities and materials show that the use of ITC is widespread but not unproblematic. Teachers and school leaders have ITC available to them but experience operational and technical issues. In addition, teachers report that they do not have sufficient competences in how to use ICT and guide the students.

6 Resource management

In this chapter, the main focus is the resource management systems of the Danish Folkeskole. By resource management systems is meant the systems applied to secure efficient and effective deployment of resources in the Danish Folkeskole. Of special concern are performance management, leadership and evaluations as a means to achieve a more efficient and effective basic education.

In a decentralised education system such as the Danish one, with no national earmarked funds for basic education, the municipalities play an important role in securing systems for managing the resources in the area. The Ministry of Education inspects the academic quality and the number of hours taught. Furthermore, national requirements apply with regard to the setting up of evaluation systems. These are, for instance, the quality report, national tests, student plans, surveys on students' wellbeing, school-leaving examinations, transition rates to youth education and international comparisons, such as PISA and TALIS. Some of these are monitored at the national level – e.g. national tests, the well-being of students, school-leaving examinations and transitions rates. They are assessed according to whether they fulfil the goals set for basic education. For instance, as part of the reform of the Folkeskole more emphasis is placed on performance management and evaluation. A new data warehouse has been set up to monitor more aspects of basic education. There are 35 indicators that are to monitor basic education. Among these are: examination results, the national test, results from surveys on the wellbeing of students, transition rates to youth education. Municipalities and schools are required to report information to the data warehouse.

Other national requirements are the responsibility of the municipalities, for instance the quality report and the schools that are responsible for setting up monitoring systems. Schools are to conduct regular evaluations of the students' learning outcome, in order to provide guidance for the student and for the future planning and organisation of the teaching (The Ministry of Education 2008: 3-4).

The reviewed studies below provide an overview over the development of resource management in 'the Folkeskole' and the various incentives linked to the systems. Moreover, it includes an analysis of the capacity building with regard to aspects that condition the development and implementation of resource management. Finally, it describes traditions of transparency and reporting that guide the systems of resource management in the Danish Folkeskole.

The main focus is the municipal level and school level, as fiscal decentralisation turns resource management at these levels and the interplay between them the anchoring part

of resource management of the Danish 'Folkeskole'. The following subthemes guide and structure the review:

- Monitoring resource use (audit system etc.)
- Outcome-based planning, rewards, sanctions and other incentives
- Capacity building for resource management
- Transparency and reporting on outputs and costs.

6.1 Overview of studies

For a description of the information presented in the table below, see Chapter 3.1.

Table 6.1 Key information about the reviewed studies, Studies of Resource Management

Ref. Id	Author(s) and publication year	Type of study	OECD Theme	Subtheme	Data type	Type of resources	Unit of analysis (N)	Data year	Study of Policy Initiatives?	Causal ambition?
[6]	Calmar Andersen, S. & Søren C. Winter (Ed.) (2011) *Ledelse, læring og trivsel i folkeskolerne*	RR	RU RM	RU3 RM2	QT- R-S	HU	ST(4311-83381) SC (375-682) TE(1130)	2008-2011	No	Yes
[10]	Bøgh Andersen et al. (2014) *How does Public Service Motivation Among Teachers Affect Student Performance in Schools?*	RA	RU RM	RU1 RM2	QT- R-S	HU	ST (5631) TE (694) SC (85)	2009-2011	No	Yes
[13]	Meier et al. (2015) *Taking Managerial Context Seriously*	RA	RD RM	RD5 RM2	QT-S	HU	SC(670)	2011	Yes	Yes
[20]	Calmar Andersen (2008) *The impact of public management reforms on student performance in Danish schools*	RA	RM	RM1 RM2	QT-S-R	TP	ST(134143)	2002-2005	Yes	Yes
[131]	Nielsen (2014) *Learning from performance feedback*	RA	RM	RM4	QT-S	HU	SC(490)	2003-2004	Yes	Yes
[198]	Gleerup & Wiedemann (2011) *Et skoleudviklingsperspektiv på evaluering. En lærende evalueringskultur*	RR	RM	RM1	QT- QL- R-S-I	?	MU SC	2005-2009	Yes	No
[224]	Bækgaard & Teglgaard Jakobsen (2011) *Ekskluderende specialundervisning*	NG	RU RM	RU3 RM2	QT-R	FI HU	ST(600000) MC (98)	2007-2009	Yes	Yes
[228]	Normann Andersen & Dahler-Larsen (2008). *The framing of public evaluation data and the legislation on openness and transparency in Danish schools*	RR	GO RM	GO2 RM2 RM4	QL- IV- TX	HU	Content analysis	2001-2004	Yes	No
[231]	Norman Andersen (2012) *Evaluering som omdrejningspunkt - om New Public Management på dansk*	RR	RM	RM1 RM3 RM4	TX	HU	Theoretical discussion		No	No
[232]	Norman Andersen & Strømbæk Pedersen (2012) *Evaluering af (og i) den danske offentlige grundskole*	RA	GO RM	GO2 RM1 RM4	QT-S	HU	SC(750) TE(760)	2007-2008	Yes	No
[254]	Danmarks Evalueringsinstitut, (2014) *TALIS 2013. OECD's lærer- og lederundersøgelse*	NG	RD RU RM	RD4 RD5 RU3 RM2 RM3	QT-S	HU	TE(164-183)	2013	No	No
[278]	Nielsen (2014) *Performance Management, Managerial Authority, and Public Service Performance*	RA	RM	RM4	QT-R	HU	SC (314) SC (45000)	2002-2005	Yes	Yes

[281]	Skolens rejsehold (2010) *Baggrundsrapport til fremtidens folkeskole*	NG	GO RD RM	GO1 GO2 GO5 RD2 RM1 RM3	QT-QL-S-R-IN	FI HU TP	NA MC (3) SC (37)	2010	No	No
[283]	Deloitte (2010) *Analyse af specialundervisning i folkeskolen*	CI	GO RD RM	GO1 GO5 RD1 RM1 RM2	QT-QL-S-R	FI TP	MC(12)	2008-2009	No	Yes
[293]	Pedersen et al. (2011) *Ledelse af folkeskolerne. Vilkår og former for skoleledelse*	RR	RD RM	RD5 RM2 RM3	QL-IN-O-QT	HU	SC(6)	2010-2011	No	Yes
[301]	EVA (2008) *Kommunale kvalitetsrapporter*	NG	RM	RM1 RM4	QT-QL	TP FI HU	MC(6-67)	2007-2008	Yes	No
[324]	Simola et al. (2011) *Governing by Numbers*	RR	GO RM	GO2 RM1 RM4	QL		NA(5)	-2007	Yes	No
[362]	Moos et al. (2013) *Successful Nordic school leadership*	RR	RD RM	RD5 RM3 RM4	QL-O	HU	Text analysis SC(6 in each country) NA(3)	2003-2009	No	No
[379]	Baviskar et al. (2014) *Kommunernes omstilling til øget inklusion pr. marts 2014*	LG	GO RD RU RM	GO2 RD1 RD6 RU2 RM3	QT-R-S-QL-IN	FI HU TP	MC(12) SC(68)	2010-2014	Yes	No
[406]	Wiedemann (2012) *Styring af styringsværktøjer? Om folkeskolelærernes erfaringer med "Fælles mål"*	RR	GO RM	GO2 RM1	QL-IN	HU	SC(9) TE	2006 - 2007	Yes	No
[436]	Andersen et al. (2009) *Quality Assurance and Evaluation in Denmark*	RA	GO RM	GO2 GO5 RM1	QT	FI HU TP PH	SC Document study		Yes	No
[461]	Mikkelsen et al. (2014) *Managing employee motivation*	RA	RU RM	RU1 RM2	QT-S	HU	TE(1190) SC(32)	2010-2011	No	Yes
[465]	Hvidman & Calmar Andersen (2014) *Impact of Performance Management in Public and Private Organisations*	RA	RD RM	RD5 RM2	QT-R-S	HU	ST(17200) SC(680)	2013	Yes	Yes

Notes: The list only includes studies with a highly satisfactory, satisfactory or somewhat satisfactory methodological quality according to the scientific norms for the applied research design. Note that some of the studies having (explicit or implicit) causal ambitions provide satisfactory descriptive inferences, though not satisfactory causal inferences.

Type of study: RA = Research articles and literature reviews (peer-reviewed); RR = Research reports and books (peer-reviewed); NG = National government evaluations and reports; LG = Local government evaluations and reports; CI = Evaluations etc. made by consulting firms or interest organizations; OT = Other studies.

OECD Theme: GO = Governance; RD = Resource distribution; RU = Resource utilisation; RM = Resource management.

Sub-theme: GO1 = Policy priorities/differences in spending per student across regions or type of municipality; GO2 = Implementation of policies; GO3 = Responsibilities across levels of the school system; GO4 = Sources of revenue; GO5 = Benchmarking of efficiency or effectiveness/ best practices.

RD1 = Distribution of resources between administrative levels and resource types; RD2 = Distribution of resources and students to individual schools; RD3 = School structure and distribution of school facilities and materials, e.g. ICT; RD4 = Distribution of teacher resources; RD5 = Distribution of school leadership resources; RD6 = Programmes targeted to specific students, e.g. resource distribution based on socio-economic criteria.

RU1 = Allocation of teacher resources to students; RU2 = Matching resources to individual students' learning needs; RU3 = Organisation of teaching and learning environment; RU4 = Organisation of student learning time; RU5 = Use of school facilities and materials, e.g. ICT

RM1 = Monitoring resource use (audit system etc.); RM2 = Outcome-based planning; rewards, sanctions and other incentives; RM3 = Capacity building for resource management; RM4 = Transparency and reporting on outputs and costs.

Type of resources: FI = Financial; HU = Human; PH=Physical TP= Targeted programs

Data type: QT = Quantitative; QL = Qualitative; S = survey; R = registers; O= Observations; IV = Interviews; TX = Text Analysis.

Unit of Analysis: ST = Students; TE = Teachers; SC = Schools; MU = Municipalities; NA = National level.

6.2 Monitoring resource use (audit system etc.)

As already discussed in Chapter 2, the monitoring of resource use in the Danish school system is a rather new phenomenon, and was introduced in the Danish Folkeskole relatively late compared to a number of other countries performance-based management (Simola et al. 2011). Below, an overview of studies describing the audit systems, the evaluating managers, and the policies and programs of evaluation is provided. The review shows a general rise in the initiation and use of data in Danish primary and upper secondary education. Comparatively, the Danish resource management systems are soft, however,. At the school level, school leaders often apply more informal leadership strategies based on relations and dialogue rather than utilising evaluation, documentation and other forms of data, such as school-leaving examination marks, national test score etc.

The growth and utilisation of data in education has increased enormously over the past 10-15 years. A comparative analysis of England, Denmark, Finland, Scotland and Sweden shows that this is the case in a number of western European countries (Simola et al. 2011). Based on a review of the literature, (Simola et al. 2011) find that the knowledge being produced and circulated as data or data-rich commentaries is increasingly used to assist governance through the evaluation of performance against targets. Thus, data have become a key resource in making policy. At the discourse level, data offer the rationale for action, and in material terms they are being generated in increasing detail, in complex forms and in many different locations. Statisticians, economists and other 'analysts' play a major role in triggering the growth in the amount of data and in the importance of data, since they use them in providing policy advice. In departments and ministries there is evidence of increased attempts to synthesise and integrate different data. This is also the case in Denmark. For instance, it is the task of the Center for the Development of Secondary and Lower Primary Schools under the jurisdiction of the Ministry of Education to develop indicators and use data for the purpose of inspection and to coordinate Denmark's participation in international comparisons. Hence, data are increasingly being used in comparison of school systems across countries, municipalities and schools. In England, Denmark, Finland, Scotland, and Sweden, knowledge about system performance is contextualised with knowledge about its performance compared to other countries and systems (Simola et al. 2011). Thus, knowledge is framed in comparisons. This applies at all levels: schools, municipalities and countries. Most of the performance data are initiated by 'official' sources and produced and circulated by government or its agencies. The data are also used to provide a shared agenda – or definitions of problems – through which networks of different interests are brought together to collectively discuss and interpret the knowledge processed by them. In sum, resource management now plays a vital role for the development of school systems in Denmark and in a number of other European countries.

Even though data play a more vital role in the development and governing of the Danish school systems, the Danish model for evaluation and quality development continues to represent a rather soft steering model (Normann Andersen 2012). The Danish model consists of both measurable and comparable elements, on the one hand,and non-measurable and incomparable components, on the other. Moreover, formally, neither rewards nor sanctions are linked to the schools' educational performance. However, informally, evaluations may be used by the municipal school administration, e.g. in relation to pay dividends, promotion and, in exceptional cases, dismissals.

A number of evaluation initiatives have been introduced (e.g. tests and assessments, student plans (portfolios) at all form levels, international comparisons, publishing of performance indicators (e.g. average grades) and municipal quality reports). The initiatives serve two purposes (Normann Andersen 2012). On the one hand, they are intended to contribute to learning and development in the municipality and in the individual schools. On the other hand, the initiatives contribute to national documentation and assist inspection of the municipalities and schools. This points to a complex system of governance in which the Danish state governs at a distance through standardisation of procedures and processes of evaluations and requirements to the documentation of the performance of the school, while also leaving room for municipalities and schools to fill in the general frames and decide how to implement and react on various data.

Thus, although regimes of quality assurance and evaluation have been on the rise on the national, municipal and school level, their progress is not linear. According to a study of the development (Normann Andersen, Dahler-Larsen & Pedersen 2009), this is due to number of reasons: tests have failed, parents have refused to be described as 'control variables', and league tables produced by a private think-tank have had school quality jumping up and down from year to year, thus undermining the credibility of the measurement. Moreover, no official league table is produced under the auspice of official authorities, although an increasing amount of data have been made publicly available, and the multiplicity of forms of data, especially at the school level, suggests that although indicators (such as average grades) do attract attention they are not the only descriptors of school quality. The study further concludes that the most important function of quality assurance and evaluation initiatives of the Danish Folkeskole have been to set the agenda, direct attention to what appears to be 'low performance' and create a sense of the need to initiate new mentalities and new policy initiatives, rather than providing direct and predictable 'steering'.

In 2004, OECD recommended that Denmark strengthened its evaluation culture of basic education. OECD noticed that there is no strong tradition for evaluation and assessment of students and an absence of self-evaluation in Danish schools (OECD, 2004: 129). A number of studies investigate how the increased focus on evaluation, documentation and performance influences the school level (Egelund 2009, Danmarks

Evalueringsinstitut 2014, Pedersen et al. 2011, Moos, Johansson & Skedsmo 2013). The studies conclude that, at both the municipal and school level, it is felt that great efforts are put into implementation of national performance goals and other initiatives (Shewbridge et al. May 2011). However, the utilisation of performance information and other evaluation results are still limited. In 2011, OECD acknowledged that a suite of compulsory measures of student learning, a system of quality reporting involving municipalities and schools, and a national structure to monitor outcomes and evaluate priorities in compulsory education have been introduced (Shewbridge et al. May 2011). But OECD concludes that these evaluation initiatives 'are not yet fully developed and do not yet form a coherent framework for evaluation and assessment'. Importantly, the framework does not include the key components of teacher and school principal appraisal. Furthermore, the private sector is not fully integrated' (Shewbridge et al. May 2011).

To varying degrees, schools experience that municipalities focus on evaluation and performance systems and that school leaders play a significant role in defining the evaluation culture and utilisation of evaluations at the school level. Based on case-studies of 4-5 schools, (Moos, Johansson & Skedsmo 2013) find that schools have a strong focus on reporting to the municipalities. The schools' results in standardized tests represent a powerful means for holding school leaders accountable. However, the extent to which the school results are linked to sanctions or other consequences in terms of soft accountability mechanisms differ from municipality to municipality.

At the school level, there is a strong focus on evaluation and performance targets, but the information from data is not fully utilised. School leaders are still responsible for translating external expectations into internal direction, and often school leaders are more reactive than proactive in this respect (Moos, Johansson & Skedsmo 2013). The shift in external (national) expectations has an impact of the inner life of schools in the sense that the schools focus more on measuring outcomes and the obligation to follow more detailed national goals, especially with respect to literacy and numeracy (Moos, Johansson & Skedsmo 2013). In particular, there has been a shift in focus towards curriculum subject areas resulting in less attention on cross-curricular activities. At the national level, more emphasis is placed on new social technologies such as teachers' and teams' annual plans and student plans. Moreover, most schools have developed goals or values for the wellbeing of students (91 per cent), the schools' educational performance (71 per cent) and study and attainment targets for various subjects (74 per cent) (Pedersen et al. 2011). Furthermore, a majority of school leaders base school strategies and goals on data on for instance students' performance (Danmarks Evalueringsinstitut 2014). Thus, at the school level more attention is placed on external demands following national goal-setting and accountability demands. This is particularly the case in large schools that work more seriously with formal documentation,

written goals and the conduction and utilisation of student performance evaluation compared to smaller schools (Pedersen et al. 2011). School leaders holding a position at schools with a large number of students and also students from a poor socio-economic background tend to develop their own performance goals that differ from national and municipal goals. They devote less attention to the educational performance of the students but tend to focus on other educational aspects (Pedersen et al. 2011). At the same time, however, school leaders and the teachers are oriented towards the more comprehensive and holistic goals of the Folkeskole (Moos, Johansson & Skedsmo 2013).

Despite the development of more evaluation initiatives, evaluations are still not fully utilized in the Danish school system (Danmarks Evalueringsinstitut 2014). Compared to other countries the evaluation culture of Danish schools is still lagging behind, and evaluation is often of a more informal nature. The degree to which the schools initiate evaluation and/or utilise the feedback from evaluations varies greatly. Around one third (36 per cent) of the schools conduct evaluations and/or utilize feedback less than once a year. Especially, the feedback from performance data is limited.

Schools primarily initiate self-evaluations to assess their performance, but the utilisation of this form of evaluation is also poor. A survey among school leaders and teachers shows that self-evaluations where the schools themselves evaluate their performance are the most common, while external evaluation where external actors or institutions evaluate the schools are less frequent (Egelund 2009). Moreover, teachers and school leaders do not consider evaluations influential, and they are utilized less than is the case for evaluations of education in other countries (Egelund 2009).

Part of the explanation for the lack of utilisation of evaluations may be found among school leaders, who do not seem to use evaluation results. At the school level, the Danish school leaders reply less often than their international counterparts that they use results from students' educational performance and evaluations more generally in their formulation of strategies and goals for the schools (Danmarks Evalueringsinstitut 2014). Similarly, (Egelund 2009) finds that Danish school leaders are not fully engaged in rules and documentation. Rather, they tend to rely on informal relations and dialogue-based methods (Egelund 2009). Compared to other TALIS countries, Danish school leaders are the ones who base their leadership on documentation and formal rules to the lowest degree.

This may be due to school leaders' scepticism towards regulation from the municipal level (Pedersen et al. 2011). A survey among school leaders (Normann Andersen & Strømbæk Pedersen 2012) shows that school leaders generally consider evaluation to be a means to develop teaching. However, some national evaluation initiatives (due to the organisation of the area) affect the schools' evaluation culture to a larger extent

than evaluation initiatives at the municipality level do. The study does not investigate further why this is the case. In addition, evaluation as documentation does not seem to affect school practice. However, school leaders find that evaluations generally contribute to improved quality consciousness at the school, and they do not think that evaluations reduce their autonomy. Also, teachers are sceptical about evaluation and performance systems. Danish teachers cooperate less with each other about the formulation of common standards of evaluation compared to their peers in other countries (Danmarks Evalueringsinstitut 2014). Moreover, they less frequently discuss the assessment of students' educational performance and learning of individual students with each other. A large share of teachers find that the feedback they receive is not based on valid assessments of their teaching. About one third of the teachers hold the view that evaluations and feedback have no impact on teaching. Furthermore, they do not believe that school leaders have access to sufficiently efficient methods of evaluation for them to fully assess the quality of the teachers' teaching. Correspondingly, Danish teachers indicate that they primarily receive feed-back on their teaching from teacher colleagues. They more seldom get feedback from their school leader (Danmarks Evalueringsinstitut 2014). In line with this, the leadership style of the school leaders has virtually no significant effects on student performance in Denmark, whereas in Texas both outward and inward management relate to student performance (Meier et al. 2015). Only leader experience and personnel quality are important for performance in Denmark, whereas in Texas a whole range of management variables are significant, including variables relating to external/outward management (Meier et al. 2015). In line with this, the use of performance management tools by Danish school leaders affects student performance positively in private schools, whereas in public schools the use of performance information does not affect test scores significantly (Hvidman & Calmar Andersen 2014).

6.3 Studies of outcome-based planning, rewards, sanctions and other incentives

As described above, no sanctions and rewards are linked to Danish schools' educational performance. The review of the studies examining the outcome-based planning, rewards, sanctions and other related initiatives further shows that municipalities are reluctant when it comes to following up on school performance, goal attainment etc. Moreover, the analysis shows that governance structure and leadership influence students' educational performance.

At the municipal level, former studies show that municipalities are cautious with regard to following up upon school performance and goals. Among other things, (Skolens Rejsehold 2010) examine the municipalities' governance of schools. The investigation relies on secondary data sources and studies, as well as on a number of, for

the most part, descriptive studies. In a survey of the municipalities' executive heads of the school area, the study finds that municipalities' follow-up on governance and dialogue with schools on their results relate primarily to marginalised children and rarely to the development of quality, goals and the educational performance of the schools at large. Moreover, the study concludes that the municipalities do not fully comply with the implementation of national goals. A survey shows that 42 per cent of city managers reply that the distribution of financial means among schools is not based on educational performance results. This implies that there are no rewards or sanctions related to schools performance results. A reason for this may be that political decisions to link budgets to performance generally involve choice ambiguity (Moynihan 2006), as it is not clear whether schools with poor or good performance should be economically rewarded. Rewarding schools with good performance may involve a risk of increasing the difference between well and poorly performing schools and thus potentially compromise political goals of increased equality in education. In addition, politicians may anticipate political costs, if they have to explain their voters that weak schools are starved of economic resources (Moynihan 2006). This choice ambiguity is empirically confirmed in the Danish context, as, in a hypothetical situation, Danish local politicians tend to allocate more resources for the Folkeskole both when student performance in the municipality is poor and good (Nielsen & Bækgaard 2015), whereas medium performance of the students leads to a decrease in allocation of resources.

Similar conclusions regarding a weak linkage between performance and rewards are reached in three case studies of the compulsory municipal quality reports. All of them apply a descriptive approach. (Danmarks Evalueringsinstitut 2008) has conducted a context analysis of 67 quality reports with the aim of describing the content of the reports, including analysing quality reports as a tool of governance. In 2007, when the study was initiated, the remaining 31 municipalities did not have an available quality report. However, most municipalities had initiated the process of developing reports. The findings suggest that most quality reports contain statistical information about, for instance, the average number of students in each class, the average cost of students and the number of students who are taught in special classes. It should however be noted, that the study was carried out in the first year of implementing quality reports. Since 2007, the content and the utilisation of the quality reports as well as the processes have developed, but no systematic studies based on more present data have been found. However, a study also points to the need to improve the municipalities' use of quality reports. The data are not fully utilized by the municipalities and schools as a means to improve the school systems and educational performance.

Similar conclusions are made by (Skolens Rejsehold 2010), who also conduct context analyses of the municipal quality reports. They find that the municipalities in the quality reports only describe the educational performance results and related infor-

mation on the schools. But when it comes to reflection and follow-up on results and goals, there is potential for improving the reports.

Finally, (Gleerup & Wiedemann 2011) investigate municipal quality reports based on the authors' own former investigations, evaluation reports and various publications on different aspects of the evaluation culture of the Danish Folkeskole. In line with the study by (Skolens Rejsehold 2010), they conclude that, so far, the quality rapports merely report descriptive performance data and are not utilized as instruments for school developments. However, they add to the conclusion by suggesting that, in an evaluation perspective, this means that the quality reports are mainly considered instruments of control or supervision, as a number of indicators measured at the municipality level may potentially form the basis for benchmarking across schools or municipalities.The quality reports are used as a trigger of learning and innovation to a lesser extent, even though this is one of the national stated purposes of the reports. Rather, the study concludes that the quality reports are mechanisms that give rise to ritual or symbolic and uni-dimensional activities. Since the study is based on secondary data sources, it is not possible to fully validate the conclusion. However, the findings of the study support the conclusions found in other studies. Based on this, it can be concluded that municipalities do not make full use of the quality reports as instruments for organizational and educational development.

Since the investigations were conducted, a number of initiatives have been initiated to improve the municipalities utilisation of the quality reports. As part of a research programme related to the recent reform of the Danish Folkeskole, KORA is currently finishing a systematic analysis of the quality reports. So far, the findings suggest that the municipalities to a larger extent integrate quality reports in the strategic leadership of the schools, formulate performance goals and follow up on goal attainment. As mentioned in Chapter 2, the quality reports were revised as part of the 2014 reform and are now only to be prepared every second year.

Governance structure and leadership influence the educational performance of students. A number of studies investigate governance at the school level, paying particular attention to the leadership of school leaders. The studies are based on similar data sources applying registry data on students' exam marks. Moreover, the studies all have the ambition of causal inference and endeavour to explain the educational performance and the effectiveness of performance management by leadership. In this regard, leadership refers both to the level of school leaders' managerial authority and their application of New Public Management tools, including utilisation of performance and evaluation information.

School leaders' implementation of New Public Management tools has a very small but significant positive effect on performance, but highly significant negative effects on equity (Calmar Andersen 2008a). Combining survey data from school leaders and reg-

istry data on students' educational performance at their final exams, (Calmar Andersen 2008a) investigates whether school leaders' adoption of New Public Management tools affects the educational performance of students. Educational performance is defined as students' average marks in the subjects Danish and maths at their school-leaving exams. The marks are controlled for the socio-economic background of the students. The operationalisation of New Public Management is based on indices including five management tools: company contracts, written goals for the school, written evaluation or feedback on achieved results, quality development and management by objectives. The degree to which school leaders deploy New Public Management is measured by both the extent to which they apply the tools and for how long they have used the tools. The study shows great variation in school leaders' application of New Public Management tools. Thus, school leaders apply management tools to varying degrees in order to increase efficiency and effectiveness. Whether adopting New Public Management tools actually increases educational performance is another question. The studies show a small but significant association between the application of New Public Management tools and students' performance as average exam scores. Furthermore, the application of New Public Management initiatives shows highly significant effects on inequity in that students with low socio-economic status perform more poorly at reforming schools than at similar non-reforming schools. In a later study (Calmar Andersen & Winter 2011), the conclusion is moderated, since the study finds that outcome-based planning and evaluation only have significant effects on schools when they are utilised simultaneously. Vis-a-vis comparison of similar schools, outcome-based planning improves students' performance only if evaluation is part of it. However, the direction of the causal relation is ambiguous. Thus, it can be argued that poor performance may lead to more focus on evaluation, just as evaluation may improve school performance. A later study utilising the same data and a stronger difference-in-difference design concludes, that the use of performance management tools in the Danish context affects test scores positively in the private schools but not in the public schools (Hvidman & Calmar Andersen 2014).

The influence of resource management and New Public Management tools on educational performance is also studied by (Nielsen 2014a). The focus of the study is how the school leaders utilize performance information, i.e. how they evaluate and follow up on resource management. The investigation relies on survey data from school leaders combined with panel data measuring educational performance as students' average marks in the subjects Danish and maths at their school-leaving exams, controlled for the students' socio-economic background. The findings suggest that school leaders to a larger extent give priority to goals that are currently performing below aspirations. Thus, perceived negative performance may trigger school leaders' utilisation of performance data and increase school leaders' incentives to use performance data for future planning and development.

Also, some dimensions of the autonomy of school leaders seem to have a positive influence on students' educational performance. (Nielsen 2014b) examines whether increased managerial authority promotes the effectiveness of performance management. The overall conclusion is that the managerial authority of the school leaders moderates the effect of performance management tools. Managerial authority over human resources positively moderates the effect of performance management, whereas decentralising goal setting works in the opposite direction (Nielsen 2014b). Based on the literature of performance management, a number of hypotheses are extrapolated including different dimensions of managerial authority. The hypotheses are tested using a 4-year panel of management and the performance data of more than 45,000 students of 314 Danish schools, including a range of socio-economic controls. This allows for a difference-in-difference design. The empirical analysis concludes that managerial authority over pay negotiations, as well as over hiring and firing, positively moderates the effects of performance management on organizational performance. In contrast, school leaders' task autonomy and authority over financial management do not influence the effectiveness of performance management. Finally, the opposite conclusion applies for goal-setting autonomy, and decentralised goal-setting reduces the effects of performance management. Where the study of (Nielsen 2014b) is designed to test the *moderating* effect of managerial autothority but not the main effect of school autonomy on student performance, (Calmar Andersen & Winter 2011) focus on the effects of school autonomy. They find that school autonomy is beneficial for students' educational performance, when the autonomy means that the schools can set goals, plan teaching and choose methods themselves, whereas autonomy in the hiring of teachers has no effect. Thus, decentralised goal setting seems to improve students' educational performance, whereas school leaders' authority to hire and fire has no effect. As noted above (Nielsen 2014b) on the other hand finds that managerial authority over pay negotiations, as well as over hiring and firing, positively *moderates* the effects of performance management.

6.4 Studies of Capacity building for resource management

Capacity building is a multi-faceted concept which refers to the organizational, individual, managerial and other aspects that condition the development and implementation of resource management. Capacity building is expected to enhance the ability of, for instance, organisations and governments to achieve measurable and sustainable results. Investigating capacity building includes both aspects that support and inhibit the likelihood that resource management will have the expected consequences and realize the expected goals. In the Danish case, no overall description exists of programmes aimed at building competencies for resource management in schools and municipalities, or central initiatives to build up a knowledge base and disseminate good practices among schools and municipalities. The reason for this is that such pro-

grammes are the responsibility of each municipality and/or school. As a result, management of resources may be organised very differently from municipality to municipality, as it is the task of the local level to decide on these matters.

For the most part, resource management is not directly included in the studies referred to below, but they describe more general capacity building in the Danish education system. The studies indicate that the effective capacity building for resource management includes an effective system of information technology (ITC) to support data sharing, as well economic incentives at the local and to some extent the school level. Changing teachers' behaviour using resource management systems may be more challenging, since they are to a large extent motivated by the desire to make a difference for the students and society in general. And maybe more importantly: the students of teachers who are motivated by the desire to make a difference for students and society attain better educational performance. However, teachers' response to resource management may vary depending on their values, their influence on the initiatives initiated and their educational background.

A number of studies investigate what motivates actors at different levels: the municipalities, schools and teachers. While economic incentives seem to be rather strong at the level of the municipalities and to some extent at the school level, teachers seem to be motivated by general aims, such as the general purpose of the Folkeskole.

The economic incentives of municipalities as a trigger of changes in special needs education are investigated in three studies. The studies give an impression of how resource management can be effectively implemented in order to attain the expected goals. In a report on the inclusion of students in need of additional vocational training, (Baviskar et al. 2014) investigate the effects of regulation and economic incentives. A governmental aim is to include literacy disadvantaged students in 'normal' classes as opposed to special schools. To investigate the municipalities' implementation of the policy, (Baviskar et al. 2014) apply a comparative case study of 12 (out of 98) municipalities in the years 2010-2014. The study builds on various data sources, including interviews, surveys and registry-based data. They findings show that in 2014 1.8 per cent more students were included in 'normal' classes in schools than in 2010. According to the study, economic incentives are essential for the municipalities' implementation of national inclusion policies, and at the municipality level economic incentives seem to be the primary triggers of change. The results of the 12 municipalities are not necessarily generalizable to the all Danish municipalities, but they indicate that resource management could be effectively supported by economic incentives.

A similar conclusion is found in a primarily descriptive study investigating the cost of special education (Deloitte 2010). Based on studies of 12 municipalities, the study suggests that the budgetary model of the municipalities is essential for explaining the ex-

penditures for special needs education. Thus, in spite of the study not allowing causal inference the authors propose that decentralized budgetary models give schools a larger incentive compared to centralized budgetary models to include literacy disadvantaged students in 'normal' classes and reduce costs. Moreover, they suggest that the distribution of resources should be followed by a more systematic governance system, which will help strengthen the control of costs and expenditures. This implies that the education system still needs more effective systems of governance and incentives.

The importance of economic incentives as triggers of change is also recognized at the school level. A comparison of the number of students receiving special needs education across municipalities finds considerable variations (Bækgaard & Teglgaard Jakobsen 2011). Thus, in some municipalities 2.5 per cent more students than expected receive special needs education, while in other municipalities 3.1 per cent fewer students than expected receive special needs education. The investigation is based on registry data, and despite the report being mainly descriptive a number of explanations for the results are proposed. In municipalities where the expenses for the most parts are held by the schools, a larger share of students receives special needs education compared to municipalities where the municipalities hold the expenses. The findings suggest that schools are less likely to recommend that students receive special needs education, if the schools are to pay for it themselves. This indicates that the activities at the schools are influenced by economic incentives. However, the likelihood that students receive special needs education is not influenced by the general economic state of the municipality. Thus, it is not the economic possibilities at the municipal level that explain variations in the share of students receiving special education.

Teachers are to a larger extent motivated by a desire to make a difference for students and society in general, while economic incentives do not seem to be a motivational factor. In contrast, (Calmar Andersen & Winter 2011) find that monetary benefits for teachers are detrimental to student performance. Thus, teachers are motivated by other things than financial incentives. The motivation of teachers has been further studied by (Bøgh Andersen, Heinesen & Holm Pedersen 2014) from Public Service Motivation (PSM) perspective. It is a question of, among other things, whether teachers are motivated by a desire to make a difference for their users (in this context students) and society in general. Combining a survey of 799 teachers with registry data on students' average marks at their school-leaving examination at the end of the 9th form, the study finds that students taught by teachers with higher Public Service Motivation achieve higher examination marks. The findings suggest that the implementation and effects of resource management on students' educational performance depend on whether the resource management initiatives support teachers' Public Service Motivation.

Moreover, soft enforcement seems to be more effective when it comes to influencing teachers' motivation. Combining two cross-sectional surveys, (Mikkelsen, Jacobsen & Bøgh

Andersen 2014) investigate whether school leaders' enforcement of a command system, such as student plans, affects teachers' intrinsic motivation The study finds that 95per cent of the school leaders have taken actions to ensure that teachers use the student plans. Moreover, teachers experiencing "hard" or "mixed" enforcement have lower levels of intrinsic motivation compared to teachers experiencing "soft" enforcement. The correlation between school principals' enforcement actions and teachers' intrinsic motivation is, however, mediated by teachers' perception of the student plan requirement as either controlling or supporting. Thus, teachers' perceptions of student plans seems also to be important.

Additionally, a number of studies investigate the capacity of Danish teachers with regard to their educational background, professionalism and reactions to resources management initiatives. Teachers may respond differently to steering initiatives, due to different values and motivations. (Wiedemann 2012) investigates how Danish teachers respond to 'Common Objectives' (the Study and attainment targets initiated by the national level, see Chapter 2) as a way to guide the performance of teachers. Based on focus group interviews with teachers at nine schools, the study finds variations in teachers' responses to the initiative. One group of teachers finds that they use common objectives to strengthen their professional identity, because performance demands then become more visible. Another group of teachers see common objectives as a threat to their autonomy and their possibility for making professionally based judgments. The study suggests that the variations are due to differences in the teachers' teaching values and in the implementation of common objectives. If teachers have participated in the implementation process, the perception of the goals is more positive. Thus, the initiation of management tools may both improve and decrease teachers' perceptions of professionalization.

6.5 Studies of transparency and reporting on outputs and costs

While some of the studies discussed analyse the reporting of output data to a certain extent, only one study of transparency of data has been found. Its focus is the media debate and motives behind the initiation of transparent performance data. The study finds that transparency of data has led to an increased public debate about the quality and aim of the Danish Folkeskole. No studies of the relation to performance have been found.

According to the Act on transparency and openness (LBK 880 of 19/09/2005), schools are obliged to publish performance indicators, such as average marks, transition frequencies to further education and results of evaluations conducted by the school. Combining interviews with central decision makers at the national level and content analysis of 150 newspaper articles from December 2001 to March 2004, (Normann Andersen & Dahler-Larsen 2008) have analysed the content of the debate in relation to

the Act and the motives behind the Act. When the Act on transparency and openness was introduced, the average marks of students of all schools were published without any concern for socio-economic differences among schools. This strategy is in line with a broad concern for openness and the right to make data transparent rather than a strict focus on accountability or statistical measurements of effects.

However, what remained was a lack of clarity regarding the extent to which these data simply indicate some aspects of school quality. This ambiguity prepared the ground for a more open public debate with participation from various perspectives, including those of underprivileged schools. The media focused mainly on marks but took a rather balanced and broad perspective on the issue, including numerous and opposing perspectives. The study suggests that this is due to a lack of cross-institutional comparisons with regard to value statements, pedagogical philosophies and school-based evaluations, which the schools were also obliged to publish according to the Act on Transparency and Openness (Normann Andersen & Dahler-Larsen 2008). Thus, the media have been instrumental in casting Denmark as a loser in the international 'horse race' of comparative tests. However, the media have also transmitted critiques of the content and methodology of these tests, as well as reports from under-achieving schools (Normann Andersen, Dahler-Larsen & Pedersen 2009).

The publication of evaluative data was in some respects seen as a goal in itself, the official programme theories on publishing these data were multiple and vague, and important end-users of the information (schools and parents) never expressed a strong interest in the data. Thus, the publishing of the schools educational performance was not followed by any requirements regarding how to act on the basis of the data made available. Moreover, on the national level, no clear intentions of increased efficiency or effectiveness were present. Nevertheless, the findings suggest a number of ramifications of the publishing of the evaluative information. Thus, publishing the data seems to have increased the awareness of evaluative information for the managing of schools, and a continued debate about the effects of the published data exists. Furthermore, the overall definition of the purpose of the schools is discussed, as well as the practice of teaching itself. In sum, publishing evaluative information about schools in Denmark promoted evaluation and established a focus on average marks as a key indicator of quality and school performance. Thus, it can be seen as a central input to the development of school-based quality and performance.

It should be noted, that since these studies of transparency were conducted a number of national initiatives regarding evaluative and performance information have been implemented including an extended use of national tests, changes in the content and frequency of Quality Reports and an internet domain making a range of indicators of resource use and performance in the Folkeskole comparable across municipalities

(www.uddannelsesstatistik.dk). However, no systematic studies of the utilisation and effects of these initiatives are yet available.

6.6 Summary and synthesis of knowledge regarding resource management

In sum, the review of the literature on resource management in the Danish school system shows that resource management has become more widespread. Thus, there has been a rise in the initiation and use of data in the Danish education system. Evaluation, documentation and performance data are available and initiated at the national, local and school level. The Danish resource management systems are, however, still comparatively soft. The Folkeskole is still the responsibility of the municipalities, and the national level governs from a distance. Moreover, school leaders are responsible for translating external requirements into internal direction at the schools. Often, school leaders are more reactive than proactive in this regard. They often apply more informal leadership strategies based on relations and dialogue, rather than utilising evaluation, documentation and other forms of data.

Municipalities are reluctant when it comes to follow-up upon school performance, goal attainment etc. Thus, despite increased information from evaluations, documentation and performance data the information is not fully utilised as an instrument that can further the development of the schools. However, the analysis shows that school leaders' application of management tools and their autonomy are important for the educational performance of students. Thus, some degree of managerial autonomy of school leaders is beneficial for students' educational performance.

The motives guiding municipalities, schools and teachers are important for effective implementation and resource management. Economic incentives seem to be rather strong at the municipality level, and to be present to some extent at the school level. If resource management is supported by economic incentives, increased compliance can be expected at the municipality and school levels. Regarding the distribution of resources to individual schools, however, it should be noted that political decisionmaking regarding linking budgets to performance involves choice ambiguity with resepect to whether poorly or well-performing schools should be rewarded. In addition, the analysis suggests that non-economic incentives should be applied in relation to the management of teachers, if the aim is to improve students' educational performance. Teachers motivated by a need to make a difference for the students and society in general attain better student performance. Teachers' responses to resource management vary depending on their values, their influence on the initiatives and their educational background.

So far, it is unknown whether increased requirements of transparency improve the performance of the Danish Folkeskole. However, increased transparency and the publica-

tion of performance data have led to an increased public debate about the quality and aim of the Danish Folkeskole.

Appendix 1: Descriptive statistics

The statistics and tables in this appendix provide a general statistical overview of resource distribution, resource utilisation and resource management in Danish primary and lower secondary schools, since the structural reform in 2007 that merged the number of municipalities from 275 to 98.

The statistics in the appendix are presented for both the national level and by municipalities. In tables presenting variations between municipalities, the small island municipalities of Læsø, Samsø, Fanø and Ærø are excluded from the data. Furthermore, outliers and values where data is questionable are excluded from data.

Table 1 Danish primary and lower secondary schools from a national point of view

	2007	2008	2009	2010	2011	2012	2013	2014
Total current municipal expenditures of primary and lower secondary schools. 2013 DKK prices in billions	54,618	54,954	56,517	55,629	53,710	52,772	51,361	52,953
Average current municipal expenditures of primary and lower secondary schools per inhabitant aged 6-16 (DKK, 2013 prices.)	72,056	72,528	74,682	73,904	71,673	70,991	69,514	71,910
Average expenditure per student in the Folkeskole (DKK, 2013 prices)				65,725	64,526	63,586	62,873	
Average size of public elementary school	379	386	387	391	419	439	436	
Average class size in public elementary schools	21.47	21.62	21.65	21.81	22.18	22.61	22.84	
Per cent of students attending private schools	12.46	12.73	12.78	13.31	13.95	14.50	14.84	
Per cent children (aged 6-16) in special schools				1.81	1.77	1.66	1.62	

Note: All averages are weigthed averages.

The figures for total current and average current municipal expenditures of primary and lower secondary schools are based on municipal accounts and include: Folkeskoler (account 3.22.01), Joint municipal costs for the school system (3.22.02), Home education (3.22.03), Special guidance (3.22.04), School buses (3.22.06), After-school care (3.22.05, 5.25.15 and 5.25.16), Special needs education in regions (3.22.07), Municipal special schools (3.22.08), Payment to private schools (3.22.10), Continuation schools and boarding schools for young people (3.22.12) Youth educational guidance (3.22.14), Sports facilities for children and young people (3.22.18) and – from 2014 – Further education (3.22.09).

Average expenditure per student in the Folkeskole are based on the financial accounts of the municipalities and cover Folkeskoler (account 3.22.01), Joint municipal costs for the school system (3.22.02) and school busses (3.22.06).

Expenditures are not adjusted for changes in tasks. Expenditures in 2013 are presumably underestimated due to lock out of teachers in the spring of 2013.

Source: The Ministry of Education, Statistics Denmark and ECO Nøgletal

Table 2 Numbers of Schools in Denmark

	2007	2008	2009	2010	2011	2012	2013	2014
Number of public schools	1,584	1,542	1,529	1,503	1,377	1,318	1,312	1,313
Number of closed public schools (net)	14	42	13	26	126	59	6	-1
Number of private Schools	497	506	504	506	520	537	548	555
Number of special schools	194	197	198	206	195	184	181	175

Note: In addition to physically closed schools, changes in the number of schools may also include schools organizationally but not physically amalgamated schools. For instance two schools organizationally amalgamated into one unit with one school leader, but continuing to have two physical locations of buildings and teaching. The number of closed schools is calculated net.

Source: The Ministry of Education: http://uvm.dk/Service/Statistik/Statistik-om-folkeskolen-og-frie-skoler/Statistik-om-grundskoler/Antal-grundskoler

Table 3 The size of the Folkeskole based on the average size of schools per municipality 2007-2013

	2007	2008	2009	2010	2011	2012	2013
Average	362	366	370	371	390	424	442
Min.	162	162	161	193	211	240	237
Max.	686	696	963	922	875	1,096	2,114
1st quartile	289.5	288.25	285.5	283.5	308	330.5	357.5
Median	358	367	373	370	385	427	444
3rd quartile	440.3	439.0	469.5	481.5	515.0	566.8	614.5
Standard deviation	114.2	115.9	138.3	139.4	140.6	169.3	259.8

Note: The figures are based on the municipalities' budget assumptions for that year.

Source: www.noegletal.dk. Published by the Danish Ministry of Economic Affairs and the Interior.

Table 4 Class size of the Folkeskole based on the average class size per municipality 2007-2013

	2007	2008	2009	2010	2011	2012	2013
Average	20.2	20.4	20.4	20.5	20.9	21.3	21.5
Min.	16.8	17.3	17	17.2	17.9	18.7	18.6
Max.	23.5	23.5	22.6	22.8	23.2	23.7	24
1st quartile	19.3	19.3	19.5	19.6	19.9	20.5	20.6
Median	20.2	20.2	20.4	20.7	21.1	21.3	21.7
3rd quartile	21.1	21.3	21.4	21.7	22.0	22.3	22.3
Standard deviation	1.3	1.3	1.2	1.2	1.2	1.2	1.2

Note: The figures are the based on the municipalities' budget assumptions for that year.

Source: Nøgletal.dk. published by the Ministry of economic affairs and the interior education

Table 5 Average municipal expenditures on primary and lower secondary education per inhabitant aged 6-16 years 2007-2013 (DKK 2013 prices)

	2007	2008	2009	2010	2011	2012	2013
Average	72,881	73,559	75,775	75,140	72,672	71,721	70,363
Min.	59,868	60,269	62,012	62,383	61,148	60,835	58,299
Max.	96,096	99,409	99,982	104,542	96,179	95,876	93,066
1st quartile	67,126	66,957	69,766	68,916	66,902	65,795	64,891
Median	70,256	71,534	73,415	73,017	70,652	69,746	67,953
3rd quartile	74,992	76,672	79,024	78,202	77,258	76,410	75,435
Standard deviation	8,346	8,820	8,729	8,796	8,285	7,996	7,903

Note: Unweighted averages. Four island municipalities not included

The current expenditures on primary and lower secondary schools are based on financial accounts of the municipalities and include the following expenditures: Folkeskoler (account 3.22.01), Joint municipal costs for the school system (3.22.02), Home education (3.22.03), Special guidance (3.22.04), School buses (3.22.06), After-school care (3.22.05, 5.25.15 and 5.25.16), Special needs education in regions (3.22.07), Municipal special schools (3.22.08), Payment to private schools (3.22.10), Continuation schools and boarding schools for young people (3.22.12) Youth educational guidance (3.22.14), Sports facilities for children and young people (3.22.18) and – from 2014 – Further education (3.22.09).

Source: ECO_nøgletal. A KORA database that collects and compares financial results and service data from all 98 municipalities. (http://www.ecoanalyse.dk)

Table 6 Average municipal expenditure per student in the Folkeskole 2010-2013 (DKK 2013 prices). Excluding municipal and regional special schools

	2010	2011	2012	2013
Average	66,126	63,626	63,013	61,190
Min.	56,496	53,031	52,393	51,611
Max.	85,199	74,483	76,341	72,271
1st quartile	60,820	59,637	59,152	57,217
Median	65,997	64,025	62,265	60,193
3rd quartile	69,629	67,785	67,818	65,828
Standard deviation	5,786	4,765	5,327	5,532

Note: The costs of the Folkeskole are based on the financial accounts of the municipalities and cover Folkeskoler (account 3.22.01), Joint municipal costs for the school system (3.22.02) and school busses (3.22.06). Expenditures in 2013 are presumably underestimated due to lock out of teachers in the spring of 2013.

Source: KORA. A study by KORA conducted to determine the municipalities' average productions cost on a number of service areas (called 'enhedspriser' (unit costs))

Table 7 Average municipal expenditure per student in special schools (in 2013 prices) 2007-2013

	2010	2011	2012	2013
Average	452,806	483,372	503,013	528,872
Min.	72,096	73,965	71,471	226,489
Max.	832,123	1,020,104	1,133,793	1,113,990
1st quartile	316,560	351,152	360,127	380,997
Median	419,531	453,513	455,782	528,872
3rd quartile	585,963	605,023	636,759	626,016
Standard deviation	172,061	193,195	210,915	204,713

Note: The costs of the Danish school system are based on financial accounts of the municipalities and covers: Municipal special schools (account 3.22.08) and special education in regions (3.22.07).

Source: KORA. A study by KORA conducted to determine the municipalities' average production costs on a number of service areas (called 'enhedspriser' (unit costs)).

Table 8 Share of students in the municipalities (age 6-16) attending private schools 2007-2013

	2007	2008	2009	2010	2011	2012	2013
Average	11.7	12.0	12.0	12.5	13.2	13.8	14.2
Min.	3.2	3.2	3.1	3.0	2.8	2.8	3.0
Max.	23.6	24.5	25.3	25.1	27.5	27.6	28.8
1st quartile	8.0	8.8	8.5	8.8	9.5	10.0	10.2
Median	10.8	11.1	11.2	11.9	12.7	13.3	13.1
3rd quartile	14.7	14.8	14.8	15.3	16.2	16.9	17.6
Standard deviation	5.0	5.0	5.0	5.1	5.4	5.5	5.7

Source: Statistics Denmark, www.statistikbanken.dk

Table 9 Share of students in the municipalities (age 6-16) attending special schools 2010-2013

	2010	2011	2012	2013
Average	1.84	1.78	1.66	1.63
Min.	0.29	0.27	0.22	0.27
Max.	5.14	4.81	4.80	4.89
1st quartile	1.16	1.06	0.95	0.91
Median	1.69	1.64	1.44	1.38
3rd quartile	2.35	2.44	2.29	2.15
Standard deviation	1.01	0.93	0.94	0.93

Source: KORA. A study by KORA conducted to determine the municipalities' average productions costs on a number of service areas (called 'enhedspriser' (unit costs)).

Table 10 Number of students per teacher in the Folkeskole in the 98 municipalities 2010-2013

	2010	2011	2012	2013
Average	9.67	10.02	10.28	10.45
Min.	3.44	7.42	7.46	7.15
Max.	11.46	12.09	12.29	12.57
1st quartile	9.18	9.28	9.67	9.69
Median	9.72	10.14	10.50	10.43
3rd quartile	10.47	10.74	11.04	11.26
Standard deviation	1.13	0.98	1.01	1.03

Source: KORA. A study by KORA to determine the average administrative costs of the municipalities (called 'administrationsanalyse').

Table 11 Average exam marks at the final exams in the Folkeskole in the 98 municipalities

	2008	2009	2010	2011	2012	2013
Average	6.3	6.1	6.4	6.4	6.5	6.6
Min.	5.2	5.1	5.4	5.3	5.6	5.1
Max.	7.8	7.5	8.0	7.7	7.9	8.1
1st quartile	6.0	5.8	6.1	6.1	6.2	6.4
Median	6.3	6.1	6.4	6.3	6.5	6.6
3rd quartile	6.6	6.3	6.7	6.5	6.7	6.9
Standard deviation	0.46	0.46	0.49	0.43	0.46	0.55

Note: 2007 are excluded from the data because of a reform of the grading system from 2007 to 2008.

Source: ECO_nøgletal. A KORA database that collects and compares financial results and service data from all 98 municipalities. (http://www.ecoanalyse.dk/menu.asp

Table 12 Per cent of inhabitants in the municipalities aged 18-21 who have started or completed upper secondary education (by the resident municipality at the age of 15)

	2009	2010	2011	2012
Average	77.9	79.1	81.3	80.0
Min	68.5	69.1	73.3	73.0
Max	87.2	86.3	89.3	88.9
1st quartile	79.9	81.4	83.4	81.9
Median	78.1	79.2	81.1	80.0
3rd quartile	79.9	81.4	83.4	81.9
Standard deviation	3.8	3.6	3.3	3.2

Note: 2013 data not yet available.

source: ECO_nøgletal. A KORA database that collects and compares financial results and service data from all 98 municipalities. (http://www.ecoanalyse.dk/menu.asp

Appendix 2: Pre-school resources

In Denmark, pre-primary education is locally sustained, primarily in the municipalities. Pre-primary education is not compulsory, but the vast majority of Danish children attend various types of day care institutions between the age of 0-5.

The regulatory system is based on the Act on Day-Care Facilities under the Ministry for Children, Education and Gender Equality.[52]

Facilities under the Danish pre-primary education are for children under school age (about age 6). The main types of facilities are:

- Nursery
- Day-care in private homes
- Kindergarten
- Age-integrated institutions

The law regulating the policy area can be found in the Act on Day-Care Facilities. The Act specifies that children in Denmark must be given the opportunity to attend a pre-primary education facility (day care facility). This obligates the local council to ensure that the necessary number of places are available for the children in the municipality. This is referred to as guaranteed day-care availability.

Regulation

In Denmark, all children must be offered day care/pre-primary education, but the parents decide whether to accept this and whether the day care is provided in public, independent or private institutions.

Pre-primary education is mainly provided by municipal institutions, such as age-integrated institutions, nurseries or kindergartens. All institutions, public, independent and private, are regulated under The Act on Day-Care Facilities. The Act compiled the rules on day care, after school and club facilities in one independent act. The Act on Day-Care Facilities was entered into law in 2007 and describes the common aims for the different types of day care facilities. The common aims are to "*provide services for children and young people that contribute to well-being, development and learning, prevention of negative social inheritance, flexibility and choice for the individual family and the consistency and continuity of services*" (KORA's translation).[53]

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52 LBK nr 30 af 22/1/2015: Bekendtgørelse af lov om dag-, fritids- og klubtilbud m.v. til børn og unge (dagtilbudsloven) (Ministeriet for Børn, Ligestilling, Integration og Sociale Forhold).

53 UVM (2015): http://uvm.dk/Uddannelser/Dagtilbudsomraadet/Love-og-regler-for-dagtilbud/Bag-om-dagtilbudsloven

The law includes and describes contents of pedagogical curriculum, mandatory language assessments and assessment of social environment.

The organisation of the Danish pre-primary education

The facilities are organized in different ways – local-authority day care centres in the municipalities, self-governing institutions or private institutions or day care in private homes (The Ministry of Children, Gender Equality, Integration and Social Affairs).

Local-authority day care centres

Local-authority day care centres are owned by the local municipality and include nurseries, kindergartens and age-integrated institutions.

Self-governing institutions

Self-governing institutions are financed by the local municipality but run by a board of parents. Local authorities must approve and conduct supervision of the institution. The set-up includes an operating agreement between the local government and the institution.

Private institutions

Private institutions are owned and operated by private individuals. The institutions must be approved by the local authorities. The private institutions have the authority to decide which children are admitted to the institution, and the local municipality grants a subsidy per child admitted to the institution (taximeter system).

Day care in private homes

Day care in private homes involves private child-minders whose work is based on an operating agreement between the scheme and the local authority. In day care in private homes there is a limit of five children per child-minding scheme. The local authority grants a subsidy per child admitted and supervises the scheme.

The table below shows the development in the number of institutions in the different types of institution. There were approximately 16 per cent fewer institutions in total in 2013 than in 2007. This reduction has taken place in both local authority day-care centres and in independent institutions, while private institutions have doubled in numbers since 2007. Day care in private homes does not appear in the table, since these homes do not constitute institutions.

Table 13 Number of day care institutions (organizational type)

	2007	2008	2009	2010	2011	2012	2013
Local-authority day care centres	3,314	3,324	3,284	3,256	3,190	3,045	2,721
Self-governing institutions	1,093	1,020	970	936	905	751	698
Private institutions	243	252	280	323	378	442	486

Source: Statistics Denmark

The reduction in number of institutions is partially due to a rise in the number of larger, age-integrated institutions and partially due to an influx in area management and district management in the municipalities. In area management, several institutions (e.g. 2-5) are combined into one large institution with a common organizational leadership, and in district management the institutions within a certain geographical area are merged organizationally but not necessarily geographically (Kjølseth Møller 2007).

Table 14 Average number of children per institution

	2007	2008	2009	2010	2011	2012	2013
Age-integrated institutions	60.8	62.5	63.3	65.3	66.0	71.3	78.1
Kindergarten	47.4	47.9	46.8	46.9	47.6	46.1	46.7
Nursery	37.0	37.7	38.5	38.5	38.9	39.5	39.8

Source: Statistics Denmark

The staffing in age-integrated institutions, kindergartens and nurseries consists of approximately 50 per cent social educators and 36 per cent social educator assistants, while the remaining 15 per cent primarily consists of managers and service staff (cleaners, kitchen assistants and janitors). There is no substantial difference in the staffing distributions between these three types of day care facilities (Statistics Denmark). Over 90 per cent of the staff employed in day care in private homes is classified as childminders, which are categorized at the same functional level as social educator assistants.

Demographics and attendance

The vast majority of Danish children between age 0 and 5 attend pre-primary education. The table below shows the development in the percentage of children in professional childcare in two separate groups – age 0 to 2 and age 3 to 5.

Table 15 Attendance ratio (per cent)

	2008	2009	2010	2011	2012	2013
0 - 2 years	66.2	65.3	67.3	67.5	67.6	67.2
3 - 5 years	96.8	96.8	97.4	97.4	97.0	97.0
0 - 5 years	81.5	81.1	82.4	82.7	82.8	82.8

Source: Statistics Denmark (including attendance in nursery, day care in private homes, kindergarten and age-integrated institutions)

Most children are cared for at home for most of their first year after birth, while the parents are on maternity and paternity leave. At age 6, most children start attending school. Under 10 per cent of children attend pre-primary education after the age of 6, which signifies the transition into primary and lower secondary education.

For children of a non-western origin, the attendance ratio is approximately 10 percentage points lower than for children of Danish origin. In total, 81 per cent of the 1-5 year old children of a non-western origin attend pre-primary education (2010), ranging from 62 per cent in the municipality with the lowest attendance ratio to 97 per cent in the municipality with the highest attendance ratio[54].

In the last seven years, more children have attended age-integrated institutions while attendance in kindergarten and day care in private homes have been in recession. The total number of children (age 0-6) declined during these years from around 312,000 in 2007 to around 302,000 in 2013 in the institutions below.

Table 16 Children in different types of institutions

	2007	2008	2009	2010	2011	2012	2013
Age-integrated institutions	134,154	148,357	153,760	160,695	169,766	179,861	185,785
Kindergarten	98,715	91,000	83,946	82,060	76,746	67,107	60,058
Day care in private homes	66,007	63,562	62,394	60,045	56,038	51,357	46,758
Nursery	13,339	12,241	11,988	11,756	11,171	10,238	9,600

Source: Statistics Denmark

Resources

In 2012, the municipal expenditure on day care facilities was 25.8 billion DKK. The net operating costs of day care, nursery, kindergarten and age-integrated institutions over the period 2008-2012 decreased by 0.7 billion DKK with variations over the years.

[54] LGDK: http://www.kl.dk/ImageVault/Images/id_50418/ImageVaultHandler.aspx

Table 17 Municipal expenditure

	2008	2009	2010	2011	2012
Net operating costs, billion DKK	26.5	27.2	27.0	26.0	25.8
Difference from year before, billion DKK	0.1	0.7	-0.2	-1.0	-0.2
Difference from year before, percentage	0.4	2.7	-0.8	-3.8	-0.8

Source: (The Ministry of Children, Gender Equality, Integration and Social Affairs)55

The cost per full time unit in day care facilities in 2013 is approximately 113,400 DKK per year in day care in private homes, while the unit cost is approximately 135,100 DKK in facilities for 0-2 year olds and 76,400 DKK in facilities for 3-5 year olds. This calculation takes the parental tuition into account but not the cost of lunch schemes.

Table 18 Unit cost (in 2014 prices)

	2011	2012	2013
Day care in private homes (0-2 year)	111,300	111,400	113,400
Day care facilities (0-2 years)	135,600	133,300	135,100
Day care facilities (3-5 years)	75,700	75,300	76,400

Source: (The Ministry of Children, Gender Equality, Integration and Social Affairs)56 based on data from The Ministry of Economic Affairs.

Young children require more attention than older children. This is indicated in the number of children that each child-minder or social educator on average is responsible for. On average, each child-minder in day care in private homes cares for 3.3 children, while each child-minder with responsibilities for children between 0-2 years old cares for 3.8 children. Child-minders with the responsibility for children between 3-5 have 6.7 children to care for on average (Dalsgaard, Nøhr & Jordan 2014)[57].

55 http://sm.dk/arbejdsomrader/dagtilbud/Tal%20og%20statistik According to the ministry, it is not possible to separate the older children and young people who participate in age-integrated institutions or to include the cost of sibling grants in the calculation.

56 http://sm.dk/arbejdsomrader/dagtilbud/Tal%20og%20statistik

57 The figures are calculated with a weighted estimate based on all enrolled children according to their age-related care needs and excluding outlier municipalities.

Table 19 Children per adult in day care in private homes

	2007	2008	2009	2010	2011	2012
Enrolled children per child-minder	3.38	3.35	3.13	3.30	3.33	3.31
Number of municipalities	*89*	*90*	*88*	*91*	*88*	*86*

Source: (Dalsgaard, Nøhr & Jordan 2014).

Table 20 Children per adult in local authority and independent day care facilities

	2007	2008	2009	2010	2011	2012
Enrolled children per child-minder (0-2 years)	3.57	3.55	3.49	3.69	3.81	3.80
Enrolled children per child-minder (3-5 years)	6.26	6.22	6.12	6.48	6.67	6.66
Number of municipalities	*92*	*89*	*91*	*90*	*90*	*91*

Source: (Dalsgaard, Nøhr & Jordan 2014)

Parental financing

Children in day care are financed partially by the local authority grants and partially by parental payment. The payment must not exceed 25 per cent of the gross operating costs for the individual day care facility or of the average gross operating costs for operating similar day care facilities in the local authority (The Ministry of Children, Gender Equality, Integration and Social Affairs).

In 2014, the average parental payment for day care for 0-2 years olds were 3,096 DKK per child per month, while it was 2,063 DKK per 3-5 year old child per month on average.

Transition to primary and lower secondary school

The law states that day care facilities, parents and schools have a responsibility to ensure a successful transition from day care to lower and primary education. The law states that day care facilities, in cooperation with the parents, must work to ensure a good transition to school by developing and supporting basic skills and the desire to learn. The law also states that the schools have a responsibility to cooperate with the pre-primary educational day care facilities to create a coherent transition to school and leisure activities (Ministeriet for Børn, Ligestilling, Integration og Sociale Forhold).

Appendix 3: Upper secondary and vocational school resources

In Denmark, youth education is split into two tracks, which include general upper secondary education and the initial vocational education and training (IVET).

Since the mid-1990s, a political goal has been to increase the percentage of a youth cohort that completes upper secondary or vocational education. In order to reach a goal of 95 per cent of a youth cohort completing youth education, incentives for increased completion rates and decreased dropout rates have been implemented at school level. In general, this means that resources from the national to the local level (schools) are distributed according to the number of students enrolled in and completing an upper secondary or vocational programme at the individual school or college.

A recent estimation shows that 92 per cent of the cohort who completed primary and lower secondary education in 2011 will complete upper secondary or vocational education within a period of 25 years (UVM 2015). In 2010, the completion rate for general upper secondary education was 86 per cent. In IVET, the completion rate was 54 per cent in 2010 (UVM 2012: 8). For several decades, the IVET system has been challenged by low completion rates, which in part are due to a lack of apprenticeship places necessary for students' to be able to complete. A national reform of the IVET system to be implemented in 2015 has a specific focus on apprenticeship places for in-company training. The reform agreement of this reform establishes four overall objectives for vocational education and training (VET). The four objectives will be translated into measurable result targets for monitoring the development of VETs at the central level and the school level[58].

Objectives	Target results
1. More students must choose to start a VET immediately following the 9th or 10th form	- At least 25 per cent must choose a VET immediately following the 9th or 10th form. This share must increase to at least 30 per cent by 2025
2. More people must complete a VET	- The completion rate must improve from 52 per cent in 2012 to at least 60 per cent by 2020 and at least 67 per cent by 2025
3. The VETs must challenge all students so they may reach their full potential	- The share of the most gifted students – measured as the share of students who complete a total number of subjects at a level which exceeds the compulsory minimum level set by the vocational committees – must increase year by year. A baseline will be established using the school year 2013/14 as a benchmark. - The high employment rate for newly graduated students must be maintained
4. The trust and well-being in the VETs must be strengthened	- The well-being of the students and the satisfaction of the businesses which hire the students must gradually increase up until 2020

Source: The Ministry of Education (2014). Improving Vocational Education and Training – overview of the reform of the Danish vocational education system. http://eng.uvm.dk/~/media/UVM/Filer/English/PDF/140708percent20Improvingpercent20Vocational%20Education%20and%20Training.pdf

58 The Ministry of Education (2014). Improving Vocational Education and Training – overview of the reform of the Danish vocational education system. http://eng.uvm.dk/~/media/UVM/Filer/English/PDF/140708%20Improving%20Vocational%20Education%20and%20Training.pdf

The intention of the reform is to provide a clear frame and direction for the vocational institutions in the coming years and for the objectives to provide a well-defined foundation for follow-up, so that both the government and the individual vocational institutions can be measured based on achieved results (The Ministry of Education 2014c). As part of the reform, the present 12 basic access channels to the VETs will be eliminated and four new vocational main subject areas established:

- Care, health and pedagogy
- Office, trade and business service
- Food, agriculture and experiences
- Technology, construction and transportation.

A basic one-year programme will be established for students coming from the 9th and 10th form, where young people will remain together for a longer time and be part of a class community. At the same time, physical exercise and activity will be an integrated part of the school day (The Ministry of Education 2014c).

The general upper secondary programmes

The general upper secondary education programmes are preparatory to higher education and comprise the 3-year upper secondary school leaving examination (STX), the higher commercial examination (HHX), the 3-year higher technical examination (HTX), and the 2-year higher preparatory examination (HF).

Schools

Nationwide, the distribution of programmes preparing for higher education is organized with 149 schools (‘gymnasium’) providing STX and/or HF, 60 schools providing HHX and 38 schools providing HTX. Together they admit approximately 46,000 students every year.

The Ministry of Education issues the rules according to which the schools work. These rules and frameworks are outlined in the Act on Institutions of Upper-secondary Education and General Adult Education (LBK nr 880).

Financing

The schools are self-governing institutions with different histories and academic profiles. Schools finance the implementation of one or more of the upper secondary education programmes by means of grants from the Ministry of Education provided on the basis of the number of students (LBK nr 880, chapter 5, § 30).

The school principal answers to a board, the composition of which reflects the school's specific profile. The teachers and students of the school appoint representatives to the board. The school board appoints and dismisses the school principal and has overall responsibility for the running of the school and its activity (LBK nr 880, chapter 4).

Quality and supervision

All schools providing one or more upper secondary educational programmes must have and utilise a system for quality development and results assessment of each individual programme and of the teaching (LBK no. 1076, Chapter 8, § 37). Within the general requirements, the school itself decides which methodology for self-assessment and quality assessment it wishes to employ. The school must be in a position to document its quality system vis-à-vis the Ministry of Education, which supervises the school's implementation of the programmes and its results. Grades and marks on each cohort are to be made public on the website for each school. This is required by law.

The initial vocational education and training programmes (IVET)

The IVET system includes social and health care, agricultural, commercial and technical programmes. IVET consists of a basic programme, which is broad in scope, and a subsequent specialized programme. There are 12 basic vocational programmes, which are typically school-based, and 111 specialized programmes. In the specialized programmes, the students alternate between school-based education and training, and in-company-based training. The duration of the IVET-programmes is normally 3-4-years (The Ministry of Children and Education 2012).

The student must enter into a training agreement with a company approved by the social partners (a confederation of representatives of employers and employees) in order to accomplish the specialized programme. The social partners have considerable influence on, and thus great responsibility for, IVET at all levels of the system; from the national level to local level at the individual school.

Colleges

117 institutions provide basic vocationally oriented education programmes. 97 of these are technical colleges, commercial colleges, agricultural colleges or combination colleges. Furthermore, 20 colleges provide social and health care training programmes.

In addition to the IVET programmes, the colleges provide the upper secondary programmes that give access to higher education: the Higher Commercial Examination (hhx), and the Higher Technical Examination (thx) and continuing education and training for adults (C-VET called AMU – Adult Vocational Training).

Management

The Danish vocational education and training programmes are governed by target and performance management. The Danish Parliament (Folketing) decides the general framework for the vocational education and training system. This applies to management, structure and objective of the programmes and also the frameworks for the institutions' tasks and development. The Act on Institutions for vocational education (LBK no. 878) outlines these rules and frameworks. Act on Vocational Education and Training (LBK 1309) outlines goals, access, structure and the overall content of the programmes.

Financing

Similar to the upper secondary programmes, the school-based part of the vocational education and training programmes is financed by the state on the basis of a taximeter system (pay per student).

The student receives wages from the company for his or her work during the internship. The Employers' Reimbursement Fund reimburses the company for the trainee's wages, when the student is attending college. All companies, both public and private, contribute a fixed annual amount to this fund for each of their employees. The students are expected to finance their wages through productive work during their internships.

Supervision and quality

Supervision of vocational education and training programmes and the vocational colleges is the task of the Ministry of Education. The trade committees approve the companies to undertake training during an internship and are responsible for monitoring the in-company training.

Following consultation with the national Council for Vocational Training, the Ministry accredits the colleges' supply of VET programmes based on a number of quality criteria.

All colleges are required by law to have a quality control and management system for continuous quality assessment and development, of which self-evaluation based on which the college's results constitutes a part. The results must be made public on the college website together with a follow-up plan for improvement and increased completion rates. Many colleges are part of a network to allow comparison of results and for mutual inspiration. For instance, one of these networks is the Vocational Colleges' Benchmarking Network, the ESB Network. Furthermore, all the VET programmes and colleges can be included in evaluations carried out by the Danish Evaluation Institute.

Number of students and educational capacity

Today, 57 per cent of a youth cohort is admitted to a VET. A declining share of these comes directly from compulsory education in primary and lower secondary education, while a number of students are admitted after having been in the labour market. A growing share is admitted after having completed general or vocational upper secondary education.

Approximately, 38 per cent of a youth cohort obtain a vocational education. Of these, around 33 per cent normally have the vocational education as their highest completed education, while the remaining 5 per cent usually go on to take higher education subsequently.

About 56,500 students commence a full-time vocational education every year, whereas the total number of students in vocational education and training programmes is approximately 130,000 at any given time.

Governance of resource use in upper secondary education

The governance of resource use in upper secondary education relies on two key principles: decentralisation and activity-based (taximeter) grants. When the system was first established for vocational schools in 1991 (general colleges were not included until 2008), it was argued that previous attempts at optimising resource use by reliance on centralized management had failed, and devolution of management was seen as key to improving school effectiveness (The Ministry of Education 2008, The Ministry of Education 1998). The taximeter system was added to provide the local school managers with an incentive to adjust capacity to suit the demand and to continually look for ways to economize and become more efficient.

As self-governing institutions, upper secondary schools themselves have the primary responsibility for deciding how to use resources. However, central government has a number of tools available for influencing the schools and the overall resource use:

- First of all, the rates for various types of students in the taximeter system are set in the annual fiscal bill. In practice, the relative composition of taximeter rates in relation to types of education has only been modified on a few occasions, such as when the rate for business college students (HHX) was raised in 2008. The schools are not required to adjust their resource use to the specific rates, for instance, a combination school may run a deficit in relation to technical college students and cover it by spending less on business college education.
- The taximeter system also provides an additional “completion rate” granted to the school when the student completes the education. This is supposed to provide the

schools with strong incentives to increase student completion. The completion rate was introduced for vocational schools in 2003.

- While taximeter rates are mostly tied to the number students, there are a few school-based rates: A "remoteness" rate provides an additional overall grant to schools in remote locations and is intended to improve educational opportunities in these areas. There are also overall additional grants for general colleges with teaching in for instance Latin and Greek.
- While the activity-based grants are by far the major source of income for upper secondary schools, the ministry retains some funds for targeted programmes. Schools may apply for such additional grants.
- Finally, upper secondary schools are obviously bound by rules and legislative acts. A recent study (Bøgh Andersen et al. 2014) found that the number of legislative acts targeting upper secondary education has substantially increased over the last 20 years. The increase is especially noticeable with regard to ministerial acts (acts issued by the ministries). The same study finds that school managers tend to find legislative acts (as well as labour agreements and internal rules) to be a source of unnecessary bureaucracy.

Resource distribution in upper secondary education

As mentioned above, financial resources are distributed according to the taximeter system. The taximeter system for upper secondary schools is different from the system for self-governing primary and lower secondary schools, since the latter has been designed with the intention moderating the impact of fluctuations in the number of students. In practice, the rate per student in private primary and lower secondary schools decreases with an increasing number of students, while the rate is constant for upper secondary schools (The Ministry of Education 1998).

Efficiency and effectiveness in upper secondary education

A recent project, financed by the Rockwool Foundation (Bøgh Andersen et al. 2014, Bogetoft & Wittrup 2015), has endeavoured to measure and benchmark the efficiency and effectiveness of upper secondary schools (colleges and vocational schools). This was done by carrying out internal benchmarking of Danish upper secondary schools (vocational schools and colleges) and external benchmarking of the Danish educational production compared to other OECD countries.

With regard to efficiency, the internal benchmarking does not identify any major efficiency potential. This is to be expected, since the taximeter system more or less guarantees that the relationship between output and input does not differ much among schools.

With regard to effectiveness, the study considers 1) Academic achievement; 2) Retention rates for different programmes; and 3) Post-course employment rates for students from different programmes. When comparing how much schools achieve these outcomes given the amount of resources they have (and the composition of students), the study indicates a modest potential for improving overall school effectiveness.

According to the external benchmarking, Danish upper secondary education is inefficient compared to other OECD countries. When applying purely quantitative models in which total costs were measured against numbers of students, Denmark's potential savings are between 12 and 27 per cent when comparing to the large group of OECD countries, and between 3 and 9 per cent when comparing to Northern European countries only.

However, when incorporating expected earnings after completion as an indicator of the quality of education, the effectiveness of the upper secondary education system appears to be high. The study is not able to determine whether it is a stable and structural phenomenon that exists in Denmark – students enrolled in a programme of upper secondary education can expected to earn high wages – because the programmes are more productive than those in other countries, or whether it is an unstable phenomenon that may well disappear under the pressure of increased international competition.

Appendix 4: Search strategy

This appendix describes the search strategy used for the literature review underlying Chapters 2-6.

The literature and research review have the purpose of creating an overview of the existing knowledge and evidence in the theme resource use in Danish primary and lower secondary schools.

The general working process

The systematic literature review was completed based on the following steps (Gough 2004):

- Initial defining of the research questions including specifications of inclusion and exclusion criteria (themes of content, different types of resources and a temporal delimitation), and also development of the search protocol
- The actual search, in this case the snowball method was used
- Identifying relevant studies that answer the research questions and meet the inclusion criteria, and that describe these along a series of dimensions, for example publication type, including focus of analysis, design and method
- Systematic quality assessment based on the studies' method
- Transverse analysis and reporting of the studies.

These steps are presented in greater detail in the following section.

Research question, inclusion and exclusion criteria.

Research question and inclusion criteria

In terms of time frame, the literature search is limited to studies published from 2007-2014.

Thematically, the search is limited by the research questions of the literature review. These are shown in Table 1. From the outset, all studies that illuminate the research themes are included. These themes relate to how resource use is governed, planned and implemented, how the resources are distributed across levels, sectors and students, how the resources are utilized in various programs and priorities, and how the resource use is managed, evaluated and followed up on.

Table 21 Research themes and research questions

Theme	Research Question
1. Governance of resource use	How is the use of resources governed, planned and implemented?
2. Resource distribution	How are resources distributed across levels, sectors and groups of students?
3. Resource utilisation	How are resources utilised in relation to various programmes and priorities?
4. Resource management	How are resources managed? How is the use of resources evaluated, and how do managers follow up on resource use?

Each theme features a series of more specific sub-themes for inclusion. These sub-themes are listed below and have been used for classification of the studies as part of the search process.

Governance of resource use:

- Policy priorities/differences in spending per student across regions or types of municipality
- Implementation of policies
- Responsibilities across levels of the school system
- Sources of revenue
- Benchmarking of efficiency or effectiveness/ best practices.

Resource distribution:

- Distribution of resources across administrative levels and resource types
- Distribution of resources and students to individual schools
- School structure and distribution of school facilities and materials, e.g. ICT
- Distribution of teacher resources
- Distribution of school leadership resources
- Targeted programs to specific students, e.g. resource distribution based on socio-economic criteria.

Resource utilisation:

- Allocation of teacher resources to students
- Matching resources to individual students' learning needs
- Organisation of teaching and learning environment
- Organisation of student learning time
- Use of school facilities and materials, e.g. ICT.

Resource management:

- Monitoring resource use (audit system etc.)

- Outcome-based planning, rewards, sanctions and other incentives
- Capacity building for resource management
- Transparency and reporting on outputs and costs.

Across the themes and sub-themes the search includes four types of resources.

Resource type	
Financial:	• e.g. public financing of the individual school and financial transactions between different levels of the school's administration.
Human:	• e.g. teachers, school leaders and administrative personnel.
Physical:	• e.g. buildings and equipment
Targeted programs:	• e.g. support programs for special student groups, programs with specific political goals and programs aimed at improving school management.

The sub-questions and inclusion criteria mentioned above are wide ranging in terms of content and potentially include myriad facets linked to resource use and efficiency in the Danish school system. The search includes both research literature and non-research literature. Therefore, the size of the body of literature being searched for has been a considerable unknown factor from the beginning. Meanwhile, the project's time frame and resources have placed restraints on the time available for the search. Therefore, the search has been handled through a strategic and reflected approach aimed at capturing the most relevant studies without removing the criterion of relevance. The procedural development of the exclusion criteria related to this and interpersonal cross-validation of the criteria of relevance have produced the following exclusion criteria:

Exclusion criteria

1. Studies published before 2007.
2. Descriptive studies in which the analysis is based on pre-2007 data (and thus do not describe the school reality after 2007).
3. Studies that do not include Denmark.
4. Studies that do not include the Folkeskole.
5. Studies of less than 10 pages (these are assumed to have the nature of communication articles and therefore not to have sufficient methodological documentation to be quality evaluated).
6. Documents that are not pdf files (these are assumed to have the nature of news and communication, rather than being analytical studies).
7. Student papers (bachelor and master theses).
8. Analyses of a single municipality or school (these are assumed to lack the potential for generalization).
9. Methodological notes.

10. Studies based on literature reviews and not contributing to any identifiable empirical knowledge about the Danish Folkeskole.
11. Didactic studies with a focus on the education situation, different styles of education and learning, provided that the study does not include data on resource use.
12. Studies of student performance and other effects of the public school activity that do not include data on resource use (e.g. Pisa tests).
13. As a result of time restrictions, studies focusing on teacher education and recruitments are not included. Any supplementary training and competence development *is* included.
14. With regard to resource management, the lowest level of management included is management of the school. Team management and classroom management are not included. Use of resources in the classes are included but not how the teaching is organized and carried out.
15. Work-in-progress is not included. This means that conference papers are omitted. Furthermore, only research publications that have been through peer-review are included.

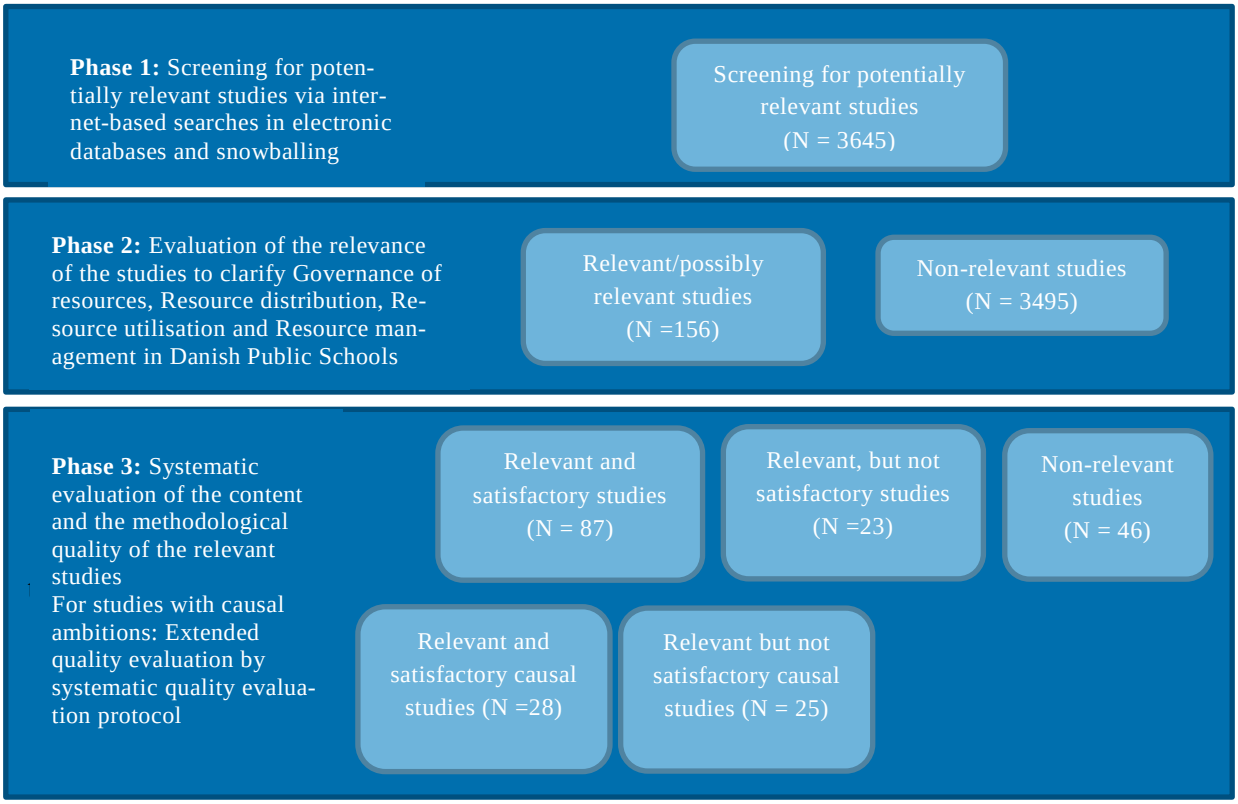
Phases in the literature review

The systematic review of studies of Governance of resources, Resource distribution, Resource utilisation and Resource management was carried out in three phases:

1. Screening for potentially relevant studies via internet-based searches in electronic databases and the application of a snowballing method
2. Evaluation of the relevance of the studies in relation to the research questions
3. Systematic evaluation of the content and the methodological quality of the relevant studies.

These phases are illustrated in Figure 1. The content of each phase is described in further detail below.

Figure 1 Overview of search strategy and number of studies in the systematic review



Phase 1: Screening for potentially relevant studies

In the present research, KORA has assessed that the use of a snowball method focusing on publications published by researchers at Danish analysis and research institutions is the optimum search strategy, rather than performing a broader search in various international bibliographical databases. The reason is that relevant literature for this research is limited to literature with a focus on the Danish case with respect to the theme on resource use in the school system. It would be a highly comprehensive and resource demanding process to search for these in international data bases. Furthermore, it would not be clear in all cases whether a particular study was concerned with the Danish case. At the same time, the risk of overlooking a relevant study using the snowball method is considered very small, since it is unlikely that an international research study on resource use in the Danish school system would be published without the participation of a Danish researcher.

In addition to scientific publications[59], the literature search has also included a broader internet-based search for inquiries and reports from public authorities, consulting houses, non-governmental organizations and other actors.

[59] Scientific publications are defined as publications that have been through a peer-review process.

Thus, the systematic search strategy rests upon two overall search pillars:

1. Targeted search with respect to Danish research institutions doing research on the Folkeskole's resources and efficiency
2. Internet-based searches for inquiries and reports from public authorities, consulting houses, non-governmental organizations and other actors.

Search pillar 1: Research institutions and key persons

Identification of scientific studies publicized in research publications was based on a systematic approach which combines searches in the Danish National Research Database and the snowball technique:

- Identification of Danish researchers in educational research, political science and economics, who have worked with resource utilisation in the school system
- Systematic searches in the Danish National Research Database
- Supplementary compilation of the involved researchers' publications as it appears on lists of publications on the universities', sector research institutions' and other actors' home pages.

The search under Search pillar 1 was based on the following identified research institutions and key persons:

Table 22 Research institutions and key persons

Research institutions	Key persons
Aarhus University/DPU	Lotte Bøgh Andersen Simon Calmar Andersen Niels Egelund Michael Søgaard Larsen Per Fibæk Laursen Sven Erik Nordenbo Søren Serritzlew Nina Smith Mads Leth Jacobsen Claus Holm Jens Rasmussen
University of Southern Denmark	Poul Aaes Nielsen Kurt Klaudi Klausen Signe Pihl Thingvad
University of Copenhagen	Mads Meier Jæger Anders Holm Peter Dahler-Larsen
Aalborg University	Per Allerup Per Nikolaj Bukh
Roskilde University	
Copenhagen Business School	Lene Holm Pedersen Justine Pors Camilla Sløk Helene Ratner
Rockwool Foundation Research Unit	Eskil Heinesen

KORA – Danish Institute for Local and Regional Government Research	Kurt Houlberg Jill Mehlbye Jesper Wittrup Karl Fritjof Krassel Søren Teglgaard Jacobsen Vibeke Normann Andersen Bente Bjørnholt Torben Pilegaard Thomas Astrup Bæk
SFI – The Danish National Centre for Social Research	Søren Winter Chantal Pohl Nielsen Beatrice Schindler Rangvid Jørgen Søndergaard
Danish Clearinghouse for Educational Research	
EVA – The Danish Evaluation Institute	
CFS – Centre for Research on School Development	Jørgen Gleerup

Note: KORA, SFI, Danish Clearinghouse for Educational Research, EVA and CFS do not systematically report to the Danish National Research Database. In the case of lacking reports, the search is based on the institutions' home pages.

The first part of the search was based on the Danish National Research Database. For every key person, a search was performed on **articles and book chapters**[60], including either 'skole', 'folkeskole', 'folkeskolelærer', 'elev', 'folkeskoleelev', 'school', 'pupil', 'student' or 'teacher' in the title or abstract.

In addition to the named key persons above, a corresponding search with no author specified was performed in the Danish National Research Database. Subsequently, the studies found were supplemented by a corresponding search for key persons on the concerned research institutions' home pages.

The snowball method was then taken a step further by sending the identified studies to selected key persons with the intention of having them supplement with their own bibliography in case it was not complete. Furthermore, these key persons could be asked to identify researchers, who were not already on KORA's list of experts. However, this step has been left out in the present literature search, because of the project's time and budget limitations, because the number of publications is already high, and because the most essential authors are assumed to be identified. Snowball emails to key persons are sent according to the following principles:

- Authors for which KORA's searches in research databases, on home pages and elsewhere have resulted in at least one relevant and satisfactory study by the author
- Danish authors
- Authors who are still employed at an analysis or research institution
- In cases of two authors, the snowball email is sent to both authors
- In cases of more than two authors, the snowball email is sent to the primary author.

[60] Conference papers are not included.

The studies found have been transferred to a structured search database in RefWorks. Furthermore, in Phase 2 they were evaluated more systematically as to their relevance.

Search pillar 2: Internet-based search for inquiries and reports from public authorities, consulting houses, non-governmental organizations and other actors.

With respect to identification of non-scientific-based inquiries and reports, the search is internet-based on selected institutions' homepages. Furthermore, KORA has gone through the bibliography in the non-scientific-based publications with the intention of identifying further studies.

The search was carried out on the following public institutions', consulting houses', non-governmental organizations' and other actors' homepages:

- Local Government Denmark
- The Ministry of Education
- The Ministry of Economic Affairs and the Interior
- The Ministry of Finance
- The Danish Union of Teachers
- The Danish Evaluation Institute (EVA)
- The National School Board (Rådet for børns læring/Skolerådet)
- The Danish National Centre for Social Research (SFI)
- Danish Institute for Local and Regional Government Research (KORA incl. publications from the former AKF and the former KREVI)
- VIA University College
- BDO
- Capacent People
- Cowi
- Deloitte
- Epinion
- Niras
- Rambøll.

As with the search for scientific literature, the following search words were used: 'skole', 'folkeskole', 'folkeskolelærer', 'elev', 'folkeskoleelev', 'school', 'pupil', 'student' or 'teacher'.

Given the inclusion and exclusion criteria mentioned above, a pre-screening of the studies' relevance was carried out in relation to the search for inquiries and reports. The pre-screening was based on the studies' titles and summaries. Studies evaluated as non-relevant with respect to the research questions on resources and efficiency in the

Danish Folkeskole were screened out. Studies evaluated as relevant or possibly relevant were transferred to a structured search database in RefWorks. Subsequently, the relevance of these studies was more systematically evaluated in Phase 2.

Phase 2: Evaluation of the studies' relevance in relation to the research questions

The studies found were systematically screened with the intention of identifying relevant studies that answer the research questions and meet the inclusion criteria, and studies that do not meet the exclusion criteria. This means, for example, that pedagogical-didactic studies focusing on the educational situation and educational and learning styles – in the case that nothing on resource use is included – have been overlooked. Just as studies of technical results and other effects of the Folkeskole's work are excluded, if nothing on resource use is included (this applies to PISA studies, for instance).

The systematic evaluation of the studies' relevance was based on the studies' titles, summaries, tables of content and conclusions. In total, 138 studies have been evaluated as relevant or potentially relevant.

Phase 3: Systematic Evaluation of the studies' content and methodological quality

In Phase 3, a systematic evaluation of the studies' content and methodological quality was performed. In relation to this, closer inspection of the studies led to a further 45 studies being evaluated as non-relevant. All relevant studies have been described according to a number of dimensions, e.g. type of publication, analytical focus, design and method.

Finally, the studies' methodological quality in relation to reliability, validity and generalizability was evaluated. On the basis of an overall evaluation, they are placed in one of the following five categories of quality:

- Highly satisfactory
- Satisfactory
- Somewhat satisfactory
- Slightly satisfactory
- Not satisfactory.

Reliability is to be understood as the degree to which the results are reliable. The validity of the results is to be understood as the degree to which the study measures and answers the questions as they are supposed to. Generalizability is to be understood as

the degree to which the results can be transferred to other contexts. In all cases, the evaluation was carried out in accordance with the scientific standards that apply for the research design in question.

Only studies evaluated as Highly satisfactory, Satisfactory or Somewhat satisfactory are included in the final review.

The content and quality evaluation template is shown in its full length below.

Study ID:	

Author(s), publ. year						
Title						
Type of study	☐ Research articles and literature reviews (peer-reviewed)	☐ Research reports and books (peer-reviewed)	☐ National government evaluations and reports	☐ Local government evaluations and reports	☐ Evaluations etc. by consulting firms or interest organizations	☐ Other studies
OECD Research topic	☐ Governance	☐ Resource distribution	☐ Resource utilisation	☐ Resource management		
Type of resources	☐ Financial	☐ Human	☐ Physical	☐ Targeted programs		
Research object	Organizational level, type of school (private/public, special schools, targeted at specific class segment etc.), type of resource, kind of effect and kind of process.					
Research question	Specific research question. Ambitions of causal inference: ☐Yes ☐ No [if yes, include details] Ambitions of providing evidence of impact of policy initiatives : ☐Yes ☐ No [if yes, include details]					
Method(s)	Type (Quantitative, Qualitative), design (RCT, other experimental designs, registry data, survey, case study), year(s) of analysis, sample size for each data collection method, unit of analysis (individuals, school departments, schools, municipalities, national level etc.).					
Findings	1) Governance of school resources (how are resources provided and policies implemented) 2) Resource distribution (how are resources distributed across organizational levels, sectors and groups of pupils). Human Resources: Teachers, School Leadership. Targeted programmes for specific students. Financial transfers to individual schools 3) Resource utilisation (how are resources used in relation to programmes and priorities?). School staff: allocating teacher resources to students. Students: Matching learning needs. Schools: Organising teaching and learning environment. 4) Resource management (how is use of resources managed, evaluated and followed up upon). Monitoring resource use: Audit systems; evaluating managers, policy/programme evaluations. Incentives: Outcome-based planning, rewards and sanctions					
Process explanations	(only studies with ambitions of causal inferences) Mechanisms or other explanations provided for causal conclusions made in the study.					
Quality evaluation	**1. All studies** Overall quality evaluation of reliability, validity and generalizability of the study with reference to the purpose of the study					

	☐Highly satisfactory ☐Satisfactory ☐Somewhat satisfactory ☐Slightly satisfactory ☐Not satisfactory The three dimensions included in the evaluation are: A. The reliability of the results (to what extent are the results obtained reliable according to the scientific norms for the applied research design) B. The validity of the results (to what extent is the study able to answer the question it is intended to answer scientifically, e.g. according to the scientific norms for the research design applied) C. The generalizability of the results (to what extent can the results be generalized to a larger setting according to the scientific norms for the applied research design). **2. Studies with ambitions of causal inference or conclusions on the impact of policy initiatives** Quality evaluation of reliability and validity based on overall criteria for quality (satisfactory study, non-satisfactory study) with reference to specific criteria for quality from the extended *quality evaluation protocol for causal studies*: ☐Satisfactory ☐Non-satisfactory The evaluation of the quality of the studies is delimited in the following way to studies of causality: • Descriptive vs. explanatory ambitions (only the latter are included). Explanatory studies include studies which use a causal language and implicitly or explicitly draw causal inferences or have an ambition of progressing towards causal explanations. • Studies of causality on efficiency and goal attainment. • Studies using the resources employed as the independent variable are included, while studies which treat resources as the dependent variable are *not* included. The only exceptions from the latter delimitation are studies designed to test economic consequences of resources per student of specific policy initiatives on (e.g. structural changes aimed at realising economies of scale).

All relevant studies have been through the above-mentioned content and quality evaluation. Studies which either explicitly or implicitly have ambitions of causal interpretation have been through an extended evaluation of the study's causal methodological qualities in relation to design, analysis and support of the conclusion. Following a judgment of the studies' causal qualities, the evaluation has categorised them as being either 'satisfactory' or 'non-satisfactory'.

The quality protocol for evaluation of causal studies is shown in its entirety below.

Quality evaluation of studies with ambitions of providing causal inferences

Study ID:	

Reference (authors and year):

	No.	Criterion	Fulfilled? + (+) - NA
Design	1a	The analyses are based on the most well-suited design (Systematic review, RCT, other experimental designs, case study) in relation to the object of the analysis and accessibility of the relevant data.	
	1b	The analyses includes a full argument for and documentation for which cases are included in the analysis and which are not, and to what extent the findings are generalizable to a well-defined population.	
	1c	The analyses include all relevant and accessible data in the field (budget figures, school registers, school staff registers, registers of pupils and their attainments, school management, evaluation and audit systems, and user and employee satisfaction surveys).	
How was it carried out?	2a	The studies were carried out in a manner that meets current quality standards – in surveys, the data should make a generalisation possible (sufficient response rate, valid questionnaire, high reliability).	
	2b	The studies were carried out in a manner that meets current quality standards – in qualitative studies, the data should sufficiently support the inferences made.	
	2c	The studies have been carried out in a manner that meets current quality standards – in other types of studies (register data etc.) the data should be provided in a systematic manner and exhaustively, and issues concerning endogeneity, causality, multicollinarity etc. have been addressed.	
Results and dissemination	3a	The conclusions in the study build on the most well-suited methods for calculating the effects of the use of resources (multivariate methods, estimation of missing values in the data set etc.) and contain arguments for the choice of calculation method.	
	3b	The analysis contains qualifying assessments of whether special contextual conditions in the individual cases/surveys/data set could have affected the calculated effect (self-selection bias, common source bias, demographic socioeconomic or other factors not controlled for, type of schools, simultaneous legislative or contextual changes etc.).	
	3c	The results of the analysis are subjected to a critical assessment of the robustness and generalizability of the results, including considerations of the results of other relevant studies in the area.	
	3d	The interpretation of the results includes well-founded and relevant information about whether any quantitative differences/changes found may be accompanied by qualitative differences/changes.	
	3e	The results are presented in such a manner that it is clear how they have been produced.	

Overall evaluation:

Satisfactory study ☐

Non-satisfactory study ☐

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