



Federal Ministry  
of Education  
and Research

# Framework Programme for Empirical Educational Research



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# 1. Challenges in education and research policy

We are called upon today to face major new challenges, from the digitalisation of almost all aspects of our lives to the quickening pace of globalisation, demographic change or preserving our democratic values. As education is vital for a self-determined lifestyle, it is imperative that the education system also address these challenges. Education affects both the prospects of every individual and their opportunities for social participation.

By implication, then, successful education processes are a prerequisite for a democratic society. They are key to growth, prosperity and sustainable economic development. Our goal, therefore, is to empower the education system, equipping it to meet the challenges of our time and offer everyone in Germany the best educational opportunities possible, regardless of their origin, gender, social status, religion or sexual orientation.

The Federal Government is embracing these challenges. The Federal Ministry of Education and Research (Bundesministerium für Bildung und Forschung, BMBF) is tasked with providing the best possible support to the education processes in our country over the course of a lifetime. In order to achieve this goal, the conditions that optimise these education processes must be clarified on an ongoing basis. This calls for outstanding educational research to establish the knowledge bases required for rational decision-making in education policy and practice. Therefore, educational research is not restricted to generating expertise and declarative knowledge, but also develops strategic and transformation knowledge that extends the procedural knowledge of its practitioners.

Globalisation and digitalisation increase the significance of education: both for innovation and technological progress, but also for social integration. The workplace now needs highly qualified, flexible employees with an aptitude for cooperation and communication. The rapid digital transformation affects not just the professional and private lives of adults, but is having a rising impact on the day-to-day experience of children and young people.

The demographic development begs the question of what challenges are posed by an ageing population, and how social and occupational participation can be guaranteed for all members of society throughout their lifespan. Regional disparities also call for viable solutions, from structurally disadvantaged regions to the social hotspots of the conurbations. Social diversity is growing and thus presenting new challenges for a peaceful and equitable coexistence.

Therefore, since 2017, the BMBF's Framework Programme for Empirical Educational Research has continued its successful research funding – ten years after the launch of the first framework programme. The new framework programme serves as an organisational umbrella, designed to offer optimal conditions for educational research.

The centrepiece of the programme is its focus on the current challenges facing education policy.

The research results will be put to greater use to address these challenges in educational contexts. To this end, the research fields of the funded projects are being expanded, along with the methodological approach. The spotlight is increasingly being placed on innovation, implementation and transfer research. A further goal is to intensify the dialogue and interaction between research, education policy and practice. The individual topics will be specified in the announcements of Federal funding.

## 2. Objectives of the Framework Programme for Empirical Educational Research

Since 2007, the first Framework Programme for the Promotion of Empirical Educational Research has been instrumental in establishing empirical educational research in Germany: there has been a marked rise in professorships focusing on empirical educational research and the number of highly qualified young academics has increased. The adoption of the National Educational Panel Study (NEPS) as an independent institute in the Leibniz Institute for Educational Trajectories attests to the successful promotion of the research infrastructure in empirical educational research. This led to the creation of a first-rate database for the analysis of educational trajectories, even by international standards.

As a result, Germany's empirical educational research became more visible on the global stage and increased its interdisciplinary approach. The endeavours in the previous research fields cover a wide range of topics, such as the professionalisation of teaching staff, educational governance, developmental disorders with regard to literacy or numeracy skills, equal opportunities and participation as well as various research topics in language education. This research generated extensive descriptive, declarative and strategic knowledge, but also specific recommendations for educational practice, particularly for schools.

The new programme will follow up on these successful strategies and develop them further. It remains focused on the high methodological quality standards of evidence-based, empirical-scientific research.

Research undertaken as part of the Framework Programme for Empirical Educational Research studies the criteria, conditions and processes of education, as well as the effectiveness of educational opportunities. It produces empirically validated findings that can be generalised and made available to education policy-makers and practitioners. It combines outstanding basic research with applied research and stands out due to its emphasis on solving problems. This presupposes dialogue with experts and relevant stakeholders from education practice, policy and administration.

The Framework Programme for Empirical Educational Research has a highly flexible structure to ensure the societal orientation of the research funding over the programme's entire lifespan. The BMBF will liaise on an ongoing basis with representatives from science, politics and administration, education practice and civil society in order to monitor the research priorities, instruments and effectiveness of the funding measures, adjusting them as necessary.

The Framework Programme for Empirical Educational Research pursues the following research policy objectives:

- To obtain insight in new fields and increase the knowledge base for education policy and practice
- To encourage cooperation between researchers and practitioners
- To drive innovations that improve the education system through research
- To extend the structure of outstanding educational research

Funding guidelines formalise these objectives into individual research priorities. These priorities specify the respective funding purpose, the object or, to be more precise, the topics of the funding and the recipients.

### 2.1 Obtaining insight in new fields – increasing the knowledge base for education policy and practice

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In future, research funding will extend beyond the previous focus on schools to encompass all different stages and processes of education throughout the educational biography. Some of the past research priorities will be pursued and explored in greater depth.

Research endeavours on current societal problems and the implications thereof for education are being stepped up. These include issues associated with the ongoing expansion of education and reducing the number of low-skilled workers. The spotlight is also on curbing

social and regional disparities, managing the increasing heterogeneity in educational institutions and exploring both the opportunities and risks of digitalisation in education. Moreover, the research funding is also aimed at structural framework conditions in the education system and in educational institutions. Particular emphasis is placed on the various interfaces connecting the educational institutions, the subsystems of the education sector and the educational stages.

A multitude of different interests and developments converge in the education system. Political institutions and educational practitioners need a solid empirical knowledge base for informed decision-making. Not only does educational research contribute comprehensive basic knowledge, it can also enhance educational practice by providing theoretically sound, empirically tested models and highlight both the potential and limitations of political and practical framework conditions. It offers insight into the factors that facilitate innovation and policymaking processes, the reasons why intended effects sometimes fail to materialise and the cause of undesirable side effects. The requirements of the various stakeholders – and their different interests – must also be taken into account in the transfer, use and interpretation of these findings.

Research issues that focus on the transfer and implementation of scientific knowledge in educational practice are ultimately given greater consideration.

## 2.2 Encouraging cooperation between researchers and practitioners

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All relevant groups, from educators, teachers and trainers to educational administrators, education policymakers and representatives of civil society, should be actively involved to improve the transfer of scientifically proven, strategic expertise and transformation knowledge into practice. The framework programme is developing appropriate mechanisms to enhance the collaboration, thereby establishing structured communication and cooperation between scientists and educational practitioners at the programme management level. When managing the funding priorities, support is given to collaborations that incorporate existing networks of educational practitioners. Policymakers,

administrators, educational institutions and the teaching staff ultimately have a shared responsibility for the quality of education.

## 2.3 Improving education – driving innovations through research

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The Framework Programme for Empirical Educational Research is based on a broad concept of innovation that also plays a pivotal role for the BMBF in other research and funding areas. This concept includes social innovations and regards civil society as a key stakeholder in innovation processes.

The accumulation of scientific knowledge and practical experience are prerequisites for successful social innovation. Innovation processes rarely run in a straight line from basic research to applied research through to implementation. The success of these complex processes is contingent on the contextual conditions. This is particularly true of the education system, where multifaceted feedback is required between the sub-processes, the institutions and the people involved. Finding appropriate formats and organisational forms that facilitate this feedback is a key aspect of innovations in education policy.

Digitalisation in the educational context is a prime example in this respect: it is not limited to new technical solutions but goes hand in hand with a need for new forms for the organisation of educational institutions, cooperation and communication. Groups such as school administration, teaching staff and students will be assigned new tasks and functions. At the same time, from the perspective of education policy, identifying good practices is a top priority. Scientifically based adherence to successful procedures (best practices) and structures is equally as relevant to the organisation of our education system as the need for improvements and for breaking new ground.

The results generated by educational research are not only invaluable for education policy, these findings also benefit research and innovation policy measures, such as the Federal Government's High-Tech Strategy or the BMBF's ten-point programme for SMEs (Vorfahrt für den Mittelstand). These strategies go some way towards

covering industry's skills needs and the demand for specialised personnel. Therefore, by publishing its results, educational research can enhance Germany's innovative capacity.

## 2.4 Expanding the structure of outstanding educational research

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The framework programme builds on the results of its predecessor and drives structural development forward in educational research. This applies above all to the

continued expansion of information and research infrastructures, as well as to promoting early career researchers and fostering international cooperation. The diversity and range of topics in educational research call for varying approaches, be it from the standpoint of education or from interdisciplinary or transdisciplinary perspectives. The programme reaches out to educational research, psychology, general and subject didactics, sociology, political science, economics and administrative science, the neurosciences and other disciplines, depending on the subject area.

# 3. Fields of action

Four primary fields of action for research funding mechanisms follow from these education and research policy objectives:

- Improving educational equity – recognising and developing individual potential
- Managing diversity and reinforcing social cohesion
- Ensuring quality in education
- Channelling and exploiting technological advances in the education sector

Various research priorities are funded within these fields of action, which overlap in many ways.

It is common sense in empirical educational research to regard education as a multi-level system. For example, the development of the individual with their baseline conditions is focused at the micro level, while reforming the institutional framework of educational programmes and opportunities is the focus of the meso level. In addition to educational institutions, this includes other important educational institutions and places of learning, each in their own right and as the interfaces of formal education (for example, businesses, families and friends, clubs or cultural activities). The macro level looks at the structures of the education system in a social context. Lastly, there is the expertise of the teaching staff and the pedagogical-didactical practices that aim to directly shape educational programmes.

This model also applies when structuring the fields of action. For certain lines of questioning, it is essential to establish investigations on multiple levels in order to identify relevant determinants, interrelationships and effect chains.

## 3.1 Improving educational equity – recognising and developing individual potential

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Educational equity must be both the goal and the yardstick against which educational policy is measured in a democratic society. Although the correlation between social background, opportunities to participate in education and academic success is no longer as marked in Germany as it was just ten years ago – as shown by the recent PISA studies, for example – an individual's social background continues to have a significant impact. Therefore, greater educational equity remains a vital political and social task.

Educational opportunities increase individual prospects and pave the way for independent, confident social participation. Educational equity does not mean that everybody has the same achievement potential. Instead, each individual should be encouraged according to their abilities and given the opportunity to participate in education, regardless of their social background.

Research may lead to a better understanding of the conditions for equal opportunities and help develop appropriate mechanisms and instruments. Issues such as access to educational programmes, the permeability of the education system and support at every stage of education are equally important as informal learning (in families, for example) and its interfaces to formal education.

### Support at every stage of education

Funding is aimed at the evolution and development of individual potential throughout the various life phases and at every educational stage from early childhood to adult education.

Educational equity presupposes that the framework conditions and requirements for the quality development of early childhood education and care programmes undergo rigorous scientific study. As regards lifelong learning, research funding focuses on managing the transfers at the interfaces of the individual educational stages and institutions. Research can help in developing concepts and models for a personalised and flexibly structured educational biography that lays the foundations for social advancement and integration.

People can only seize the opportunity of choosing between different education and career paths if they are aware of their own abilities and familiar with the educational programmes available. Even in a family context, the necessary skills are indispensable in exercising control over each person's educational development – proactively, realistically and independently.

With the world of work changing at breakneck speed, this is of vital importance. The knowledge and skills that were once acquired are no longer sufficient for an entire career. Moreover, the chance of playing an active, self-determined role in the social, cultural and political life of the community is contingent upon this. In a demographic development that sees an ageing population, questions concerning the individual or institutional structure of lifelong learning are becoming increasingly relevant. This applies to both our professional and personal lives as a whole.

The research community is tasked with finding answers to the countless related issues: how to impart the necessary skills that enable the individual to plan their own educational biography? Which counselling and

support services offer the best possible guidance for education and career choices? What role do educational institutions and teachers play in this respect and what conditions facilitate optimal cooperation between stakeholders at every stage of education?

### Recognising and developing individual potential

Encouraging individuals to achieve their potential is one of the framework programme's education policy objectives. It is equally important to create an environment that stimulates and cultivates the development of new interests and potential. Within the scope of individual advancement, the challenge is to offer everyone appropriate support according to their specific abilities. At the same time, it is important to encourage communication among the learners.

The right balance of individual and joint learning can only be achieved if teachers are fully competent to diagnose these disorders. Furthermore, reliable diagnosis tools and funding mechanisms are needed. Therefore, the Framework Programme for Empirical Educational Research sets great store by research into diagnostics and the development of individual potential. It aims to design instruments to support learners at different stages of their education and to study their impact. Close collaboration with expert educational practitioners is crucial in achieving these objectives.

Furthermore, it is imperative that specialist diagnosis and support methods be developed to encourage top-performing pupils and those with the potential to be particularly high-achievers. International benchmarking studies indicate that the potential of this top-level group is not yet being sufficiently exploited in Germany. As we depend on the ideas, creativity and commitment of the best minds, these issues need to be addressed. Therefore, the framework programme intends to fund research projects that seek to improve the quality of counselling and support services, boost teachers' diagnostic skills or increase learners' motivation and skills development. This research will contribute to and complement the joint initiative of the Federal Government and the *Länder* to promote top-performing pupils and those with the potential to be particularly high-achievers (Gemeinsame Initiative von Bund und Ländern zur Förderung leistungsstarker und potenziell besonders leistungsfähiger Schülerinnen und Schüler).



The aim is to build on the previous results of the research priority in the field of developmental disorders with regard to literacy or numeracy skills. Recent studies make reference to the correlation between developmental learning disabilities with regard to academic skills (such as dyslexia or dyscalculia) and children's other individual dispositions (for example, psychosocial stress factors), highlighting targeted, specialised support measures. A further improvement is the extension of the research funding to include adolescents and adults.

### **Paving the way for social participation**

Along with the family, the task of the education system is to teach the necessary abilities and skills that enable every individual to play an active, self-determined role in the social, cultural, economic and political life of the community. In addition to instilling basic values and an appreciation of culture, language learning is key. Academic success and social participation are difficult to imagine without good language skills. All the more alarming, then, is the fact that a slew of studies have found severe language deficits among many children and adolescents, both with and without a migrant background. How can we encourage the acquisition of German language skills and multilingualism? Here again, there is a need for further research.

One of society's central functions is to ensure that newly arrived immigrants are granted access to German language courses, from early childhood through to adult education and further training. Therefore, the framework programme also focuses on the proper conditions for learning German as a second or foreign language. The emphasis here is on developing appropriate diagnostic tools to assess the specific training requirements and, accordingly, on qualifying the specialists involved. To this end, research can build on the results of the research clusters on Language Diagnostics and Language Support and Language Education and Multilingualism.

Apart from learning the language, cultural education is pivotal to social participation, offering the individual the opportunity to come to terms with themselves and explore their environment through the medium of art. Published in 2015, a funding guideline aims to place questions concerning cultural education on a sustainable footing from the perspective of educational research. In future, research funding in this field will shed light on new challenges such as these, especially

those arising from digitalisation. The same applies to the possible impact of cultural education on cognitive and non-cognitive skills.

Social participation is determined by external conditions, such as access to first-class educational programmes in early childhood education, for example, or all-day school. Regional education landscapes and socio-spatial disparities between urban and rural areas also play a key role. Research may bring about a greater understanding of these interdependencies and serve as a catalyst in developing solutions to eliminate these disparities. These aims must be pursued and cultivated.

The prerequisite for participation is growing up without physical or psychological violence. Therefore, in order to better protect children and adolescents, the BMBF supports research on the structural, personal and interactional determinants of sexualised violence in educational contexts, in addition to the evaluation and ongoing development of preventive pedagogical concepts, strategies and materials.

## **3.2 Managing diversity and reinforcing social cohesion**

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The diversity of our society continues to grow. People in Germany differ in their ethnic, cultural and social backgrounds, their lifestyles and learning paths, their psycho-social and cognitive development. Although globalisation and digitalisation encourage the further differentiation of interests, opinions, needs and abilities, they are also conducive to social interaction and integration.

The increase in diversity is also having an impact on the education system, which now faces the difficult task of fostering the special talents of each and every member of society, despite all their differences and without losing sight of the crucial similarities.

It is therefore imperative to strengthen the potential of constructive cooperation between people from different backgrounds, while identifying the risks and taking account of institutional and systemic requirements. This is an important condition for a successful democratic polity.

### Managing diversity

One of the key questions addressed by the framework programme is how to ensure the effectiveness of educational practice in face of increasing diversity. Studying how to manage heterogeneity in educational institutions, in instruction and in specific teaching-learning situations or study groups is a major focus. Emphasis is placed on the expansion and evaluation of subject-specific teaching concepts that combine personalised learning and learning in groups. The role of teachers and their skills are also central topics.

Diversity strategies must always be assessed according to how effectively educational institutions develop the potential of every learner and reinforce the learning community, for example a class in a school or vocational college, a nursery group, a sports club, a drama or dance group. Apart from interaction in teaching-learning situations, particular consideration is given to the constellations in different learning environments, including regional education landscapes, and the interrelationships between non-institutional and informal centres of learning. The integrative potential created by using digital media also figures prominently.

The research focus on inclusion will be continued. Inclusive education, understood to mean the joint teaching-learning process of people with disparate learning capacities and abilities, is a key aspect of education policy. To this end, the spotlight is also being turned onto mechanisms of social exclusion. For the time being, the BMBF's research funding concentrates on training the teaching staff with regard to inclusive education processes in all areas of education: the knowledge, expertise and actions of educational practitioners are the mainstay of learners' academic success, regardless of whether they have disabilities. At centre stage are questions on diagnostics and other issues related to inclusive education in schools and extracurricular contexts.

### Reinforcing social cohesion

In light of society's growing diversity, ensuring equal opportunities and developing a democratic system of values are particularly crucial.

New research priorities in this field are intercultural education and the instilling of values, including the development of a value system, as well as the search for

factors that favour or inhibit the processes of intercultural communication. In a society characterised by diversity, the concepts of democracy, tolerance and mutual understanding necessitate a learning process that involves effort and dedication, both on the part of the migrants and the host society. It refers to our democratic identity, learning and exercising democratic practices, civic engagement and a willingness to accept responsibility. The framework programme provides the opportunity to evaluate the necessary individual and institutional conditions and develop appropriate strategies for education processes.

## 3.3 Ensuring quality in education

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Germany is jockeying for position with other countries in Europe and elsewhere in the world in the competition to develop groundbreaking products, services and technologies that also create new jobs. Companies around the globe are competing for highly skilled employees. The level of education and qualifications attained by those graduating from a country's educational institutions have enormous implications for the attractiveness of the business location and are key to its economic success in the international arena. Owing to their impact on the performance of the economy, education systems are no longer simply a secondary but a primary factor in the international marketplace. The quality of the education systems themselves has become the focus of competition on a global scale.

Moreover, quality development in the education system is crucial to overcoming the Grand Societal Challenges that are outlined in the other priority areas. Quality development must be put in place at every level, from the micro to the meso and macro levels, and in all stages of education.

Over the past 15 years, a range of quality assurance measures have been developed and tested, and new management tools introduced, particularly in schools. They show that there is not just a wide array of quality standards and criteria, but also outstanding issues that must be resolved with further research.

### Quality at the systems level

Research at the macro level seeks to evaluate the impact of quality assurance measures, such as legislation,

regulations, education policy guidelines or control mechanisms, on the education system as a whole. A further focus of interest are the mutual interdependencies between the various levels of action, the behavioural patterns of the participants who set the parameters and the question of what exactly defines high-quality education. The framework programme also aims to investigate the role of new providers in the overall education system, in terms of the economics and geography of education, and from a sociological and regulatory point of view. Particular emphasis is placed on examining the effects of existing structures and general conditions, establishing quality assurance measures and quality development, and exploring opportunities for cooperation. Gaining a greater understanding of how the qualifications attained serve both the individual and society is also paramount. This takes account of the monetary benefits of education as well as the type and scale of non-monetary advantages – for all qualification pathways and education stages. It also includes the relationship between education and health, as well as social participation, value orientation and family education.

### **Quality at the organisational level**

Most quality development and quality assurance concepts start at the level of the institutions and organisations in the education sector. Therefore, research is concentrating first and foremost on education management, the actions of supervisory bodies and organisational and personnel development strategies in educational institutions in the context of personalisation and regional development. One important topic for education policy and research is supporting educational institutions in challenging social milieus, for example in areas with high unemployment, a high percentage of families with a migrant background or a weak infrastructure. This builds on the results achieved by the Educational Governance research priority. It is also a question of developing appropriate management concepts for educational institutions, given their increased autonomy.

### **Quality at the level of staff in educational institutions**

Quality in education largely depends on the professionalism of the teachers and the specialised personnel in schools and extracurricular programmes. The demands placed on the staff in educational institutions and train-

ing centres are growing apace with the major challenges confronting society today. Firstly, pending issues include concepts for teacher training and further training at every stage of education. Secondly, as the prerequisite for the academic success of the various groups of learners, the expertise of the teaching staff requires further study. By supporting investigation into the conditions that foster the development of the professional skills of the pedagogical personnel for inclusive education, the research priority serves as a starting point.

Other research topics in the field of professional competence include diagnostic and specialist skills, the role played by non-cognitive skills in teaching-learning processes and how to deal with interdisciplinary occupational requirements. Moreover, research considers appropriate forms of collaboration that go beyond the processes of teaching or learning: how to establish constructive cooperation between the teaching staff and parents. How are specialised personnel trained to work in multi-professional teams and how can educational research findings be transferred into teaching practice? In addition, research is exploring the opportunities offered by cooperative training concepts for teachers, for example in learning communities. The interfaces to the Teaching Quality Pact can be used for networking insofar as these questions have a bearing on the competence of teachers.

### **Quality at the level of educational methods**

Empirical research at schools has recognised the importance of teaching quality for effective learning. The same applies to the teaching practices deployed in other educational institutions and the workplace. The essential factors are not the external organisation of study groups and the social forms, but the focus on the learner, cognitive activation and other criteria for teaching quality. Implementation of and compliance with these quality criteria are significant at every level: for the teaching staff, the educational institutions (entrenched in the organisations) and the education system as a whole.

However, in many contexts and subjects, there is still a lack of appropriate models to put these quality criteria into practice. Until now, didactics and teaching methodology topics have not been included in the systematic research funding of the first framework programme. In the new Framework Programme for Empirical Educational Research, it is now possible to

develop and refine specialised, thematic models to improve teaching and educational practices. Systematic study is to be made of the conditions under which the models and practices are applied successfully, along with the subsequent effects thereof.

### 3.4 Channelling and exploiting technological advances in the education sector

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The staggering pace of technological progress implies innumerable fundamental changes, for example, new digital formats of teaching and learning, innovative infrastructures in information and communication technologies or increasing automation. It affects the way people in Germany live, learn and work. The working environment in particular is undergoing radical change due to digitalisation, creating employees with completely new skills profiles.

This development is giving rise to profound upheavals and challenges for the education system. New answers are needed at every stage: in nurseries, schools and universities, vocational education and training or educational programmes for senior citizens. It is particularly important to prepare young people for these new challenges at an early stage. They must be able to respond to the changing requirements of an increasingly digitalised workplace and adopt a responsible approach to using the technical possibilities. Every individual is compelled not just to march in step with progress, but also to understand and shape the processes.

Technological innovations and digital media have the potential to improve the quality of education. By launching the Education initiative for the digital knowledge society, the BMBF provided a comprehensive framework for the entire education system, thereby building on the Federal Government's Digital Agenda 2014–2017. At the same time, the *Länder* are pursuing the Education in the digital world strategy, which is aimed first and foremost at schools, vocational schools and universities. Both strategies also highlight new research priorities, for example appropriate framework conditions to ensure that school development moves towards a comprehensive digital literacy programme.

In addition, educational practice and policy need answers to other questions: how is technological progress changing patterns of reception and production? What are the implications for learning behaviour, strategies and processes? New knowledge is essential in these fields in order to be able to respond adequately to the changing face of education.

#### Seizing the opportunities of digitalisation

The goal is for everyone to reap the benefits of new technologies for their personal learning process. Education policy endorses funding for all research projects that help achieve this objective. In addition to researching the necessary skills and abilities, exploring the appropriate use of digital media in teaching-learning processes is a priority. Science-based pedagogical approaches are vital to prepare the way for digital education in all age groups and to integrate new technologies in existing learning environments. One key topic is the use of digital media to provide individual support, including the risks of isolation in the learning process as a result of highly customised solutions. Other issues are exploring new avenues in competence diagnostics, digital concepts of teaching and learning in groups and the general advantages of digital learning environments compared with traditional learning media.

Therefore, the framework programme supports research into new concepts of media literacy. How is basic, application-oriented knowledge generated? Under what conditions can which specific media be used instructively and effectively? Related aspects include how and to what extent digital media can be used to accommodate different age groups.

Educational practitioners need information on the new requirements that are being placed on teacher training. The potentials arising from the use of New Media and technologies in personalised learning environments and self-controlled learning processes are the focus of special attention. In order to better understand and optimise learning in different learning environments, funding is also granted to research into the analysis and evaluation of vast quantities of data about learners who use New Media to learn (learning analytics).

Another area of interest is how digitally based formats of teaching and learning gain currency and become established in formal education. The main emphasis

here is on structural and organisational issues, along with suitable forms of implementation. Digital education plays a special role in vocational education and training. Digital learning will become commonplace in vocational training. Accelerating this change process – while assuring its high quality – is the goal of the Federal Government’s Digital Agenda.

Vocational schools are key to the socialisation of young people, particularly with regard to their learning habits and methods. To date, only few vocational schools include digital literacy as an integral part of the curriculum.

### **Boosting confidence in the use of digital media**

What skills are required to navigate the flood of information disseminated on New Media? How can we distinguish between what is trivial and what is important? What is the best way of assessing the reliability and quality of information and its sources?

The framework programme is opening up new areas of research in this regard. Educational research can provide valuable insight into the processes of acquiring and selecting information, while developing appropriate learning concepts. Against this backdrop, socio-spatial disparities and gender issues will also be studied in greater depth.

## 4. Structure, instruments and organisation

Quality assurance processes and structures are enshrined in the Framework Programme for Empirical Educational Research in order to achieve the education and research policy goals and guarantee research excellence.

### 4.1 Continuing structural support in educational research

#### **Upgrading research infrastructures and using research data**

The National Educational Panel Study (NEPS) has been extended over the long term, thereby establishing a representative database for the analysis of educational trajectories on the international stage. Further improvements in infrastructure funding are still needed with regard to the compilation and provision of research data from the framework programme and from research projects, such as the international comparative studies on educational standards. A number of data pools have recently been set up in Germany, some thanks to BMBF funding. These may be used to work on educational research issues and developed systematically as part of a long-term process.

Therefore, prior to launching BMBF-funded projects, it is imperative to consider whether existing data can be utilised, thereby minimising the time and effort involved in generating new data.

The current data resources serve as a starting point for the ongoing development of information and research data infrastructures in the education sector. The funding of the German Network for Educational Research Data (Verbund Forschungsdaten Bildung) in the framework programme is intended to create optimal, target group-specific conditions for empirical research and increase its potential for excellence. This means providing access to quality-assured data and safeguarding valuable resources over the long term. Researchers are encouraged not merely to produce data, but also to use it. The German Network for Educational Research Data provides the basis for a cooperative network with a standardised, user-friendly architecture. The objective of the Framework Programme for Empirical Educational Research is to develop this network and extend the research data infrastructure by recruiting further partners from educational research and associated disciplines.

The framework programme intends to induce researchers to use the existing data repositories and make their own data available to others. BMBF-funded projects include the basic obligation to transfer any data acquired during the course of the undertaking to a research data centre on completion of the project so that they are at the disposal of the entire scientific community.

### **Nurturing early career researchers**

The measures included in the first Framework Programme for Empirical Educational Research to encourage the next generation of scientists met with a great deal of success. As a first step, the situation of young educational researchers is being studied to ensure the continued development of these instruments. This will serve as a basis for developing new funding options aimed at post-doctoral researchers.

The interdisciplinary or transdisciplinary cooperation that is a hallmark of educational research is not standard practice in German academia, which is geared towards specific disciplines. The special advantages of the interdisciplinary approach are often underestimated when evaluating research projects. In particular, this discourages early career researchers from participating in research projects of this kind. Therefore, the educational research development scheme for those with high potential places special emphasis on inter- and transdisciplinary cooperation, specifically supporting skills acquisition with regard to relevant methods and instruments.

Collaboration and dialogue between scientists and educational practitioners go hand in hand with far-reaching new requirements for young researchers. The framework programme has responded by incorporating appropriate funding schemes. Moreover, the new skills help young scientists to subsequently find positions in educational practice and administration as an attractive alternative to a scientific career in teaching and research.

### **Intensifying international collaboration**

The first framework programme was instrumental in raising the international profile of educational research in Germany. International collaboration offers an opportunity to discover new topics and methods, and to learn from scientists from other countries. Therefore, the framework programme will continue to support educational researchers who have been granted funding, encouraging them to establish contacts around the world and intensify international partnerships. This is tremendously important because many of the research priorities addressed in the fields of action are not just studied in Germany. International comparisons of research findings may do the groundwork for developing joint strategies to deal with major societal challenges, particularly in the education system. The development and application of new funding instruments will be

based on a review of the existing mechanisms for researchers in this field.

Moreover, to improve the interaction of research and practice, it is recommended that teams also apply for funding under the EU Framework Programme for Research, which finances educational research carried out by the European Research Council (ERC) as part of the Marie-Skłodowska-Curie Actions and as a cross-sectoral issue associated with the challenges facing society.

## **4.2 Responding flexibly to challenges: the participatory and continuous development of the framework programme**

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The open framework outlined in the priority areas will be fleshed out over the course of the programme. Various key stakeholders and target groups will be involved in defining this process. Innovative pilot projects and experimental measures that enable a rapid response to ongoing needs for further research are also to receive funding.

### **Discourse on programme development**

A broad, open debate is a prerequisite in enhancing a funding strategy that is built around current social challenges and their impact on education. An advisory committee composed of educational researchers, practitioners and administrators contributed to the formulation of the framework programme. Henceforth, it will identify and prioritise the need for further research, reflect the results thereof and guide the continued development of the framework programme. In parallel to the transfer of knowledge to society, knowledge is also exchanged from practice to science. By this means, research takes account of practical problems and expertise from the outset.

### **Monitoring mechanisms and meta-projects for forward-looking topics**

Monitoring mechanisms will accompany the programme in order to reflect and elaborate the Framework Programme for Empirical Educational Research as a learning programme on an ongoing basis. The research priorities will be constantly reviewed to assess whether there is a need for further research. All insight gained from evaluating ongoing and concluded meas-

ures, and from the discussion with stakeholders from various social spheres, will be taken into consideration.

Furthermore, the monitoring also serves to systematically observe and appraise research activities in the different topics. Meta-analyses, systematic reviews or foresight studies may also be commissioned to achieve this goal. By funding meta-projects, research findings can be placed in an overarching scientific and social framework for the scientific community.

Meta-projects are designed to help document the results and developments of the research priority and study them from a scientific perspective. At the same time, they will be linked to educational research concepts in Germany and abroad. Meta-analyses aim to establish compatibility in scientific, practical and social contexts, while ensuring progress in the research field. They encourage networking with practitioners and pool research findings for subsequent transfer. Thus, meta-projects figure prominently in the self-reflection process of educational research.

### 4.3 Quality assurance and evaluation

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The framework programme funds research formats that can be used for method-controlled research and development. Depending on the field, issues and status of the research, it must be decided which methods and approaches are to be brought to bear. Science-based procedures ensure the excellence of the research funding. This applies to the competitive processes associated with the public announcement of funding guidelines and to the scientific coordination and thematic focus of the funded projects and their findings. The latter ensures that the funded research also gains sufficient visibility.

Peer reviews by external experts and the systematic monitoring mechanisms accompanying the programme are indispensable in upholding scientific excellence. Analysing the results of the meta-projects is another effective method of quality control.

The evaluation of the framework programme for educational research aims to highlight the extent to which the programme's objectives were reached and the quality of the results. Wherever possible, the results and effects of the research measures are to be analysed by means of

indicators. The data are collected for the ensuing impact studies, which are carried out during the programme's lifespan. The results will accelerate the strategic development of the programme's contents and structure.

## 4.4 Funding instruments

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### A broad spectrum of funding instruments

Collaborative research projects are a tried-and-tested project funding instrument. In educational research, they are subject to special requirements with regard to interdisciplinarity, applicability and the quality of the research process. The Framework Programme for Empirical Educational Research refines the current project funding approaches. In addition, it tests and evaluates approaches that incorporate transfer and implementation in the research process from the outset. In turn, these instruments – and the effectiveness thereof – become the subject of research.

Innovative research methods and formats foster the dialogue with partners from practice, for example in the form of collaboration between scientists and practitioners. Depending on the field, this will also include institutions in the education system, such as the institutes for school development and quality of the *Länder*, local authority associations, education authorities, public welfare organisations and professional associations.

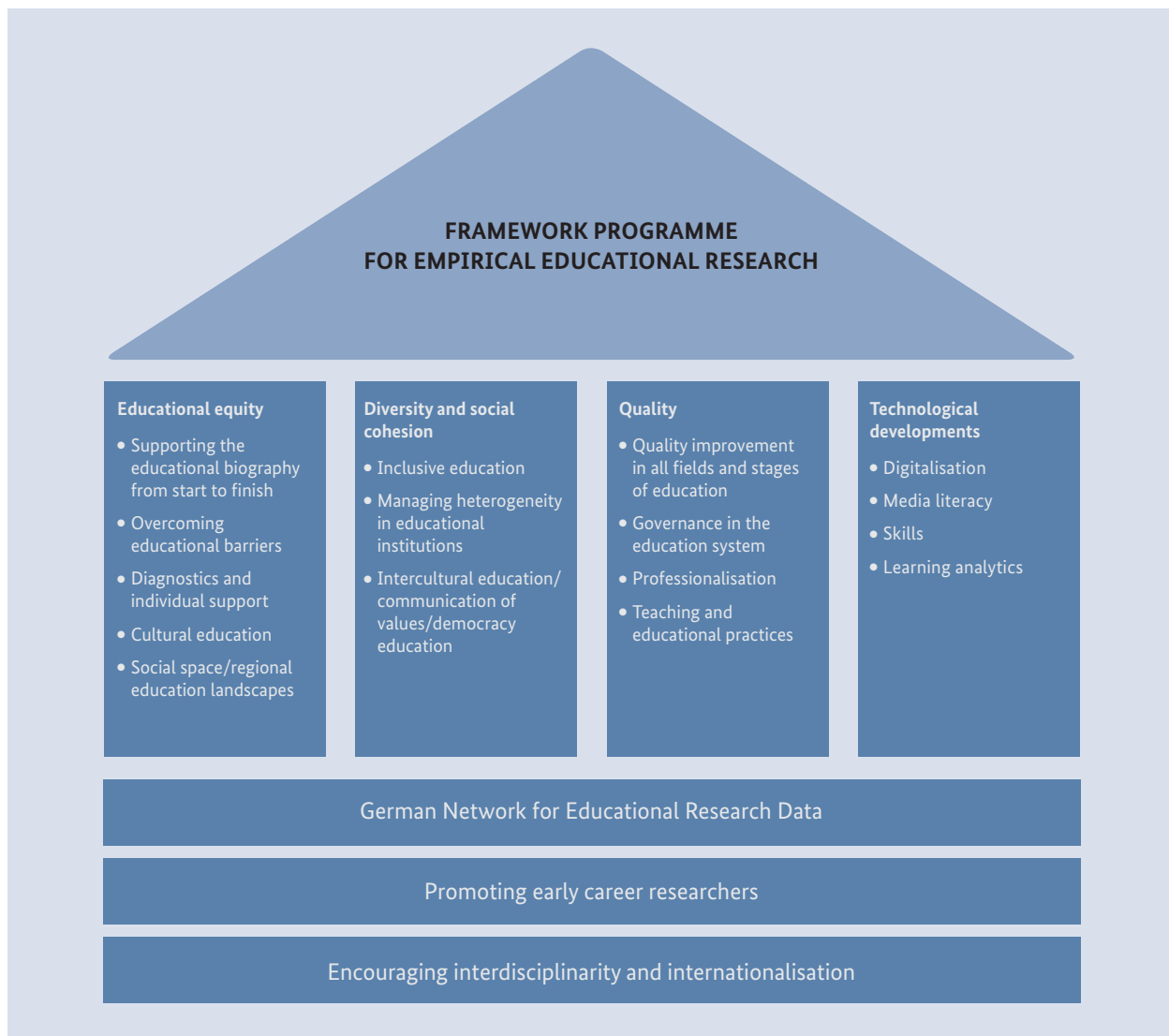
### Enhancing the synergy between project funding and institutional funding

The combined effect of institutional and project funding leads to synergies for research funding mechanisms in the aggregate. The establishment of research priorities and the increasing division of labour, networking and competitiveness lend more weight to these synergies. Within the scope of project funding, further study will follow up systematically on basic research findings, which are mainly produced by the science organisations such as the institutes of the Max Planck Society (MPG), the Leibniz Association (WGL) and the German Research Foundation (DFG). The practice-related issues of project funding also benefit from the close collaboration with networks like the Leibniz Education Research Network (LERN). Moreover, the results of research projects carried out by the Federal Institute for Vocational Education and Training, other federal departments, the *Länder* or foundations are also to be incorporated.

## 5. Funding volume and lifespan of the programme

The first phase of the Framework Programme for Empirical Educational Research is designed to run for a period of seven years. The decision on whether to continue the programme will be based on an evaluation after five years.

In order to give due consideration to the scope of the outlined fields of action, the BMBF has earmarked approximately 250 million euros for the period 2017 to 2022.





## 6. Connection to other programmes and research priorities

### 6.1 The research and innovation funding mechanisms of the BMBF

Various features of the Framework Programme for Empirical Educational Research overlap with other BMBF programmes and research priorities. The plan is to cross-link these features via thematic and structural interfaces throughout the programme's lifespan. The main points of reference are described below.

#### Research in higher education and the science system

Science and higher education research examines the requirements, structures and performance processes of research and tertiary education, along with related activities (the promotion of early career researchers, further scientific training or the 'Third Mission' of universities). It reflects on – and subsequently contextualises – general developments in the science system, first and foremost in the institutions of higher education as its centre of gravity.

The spotlight of scientific interest has been increasingly turned onto research institutes and universities. This may be attributed firstly to the increased significance of this section of society and secondly to the far-reaching modernisation and reform measures in recent years. Meanwhile, in the spheres of policy and practice, the demand for reliable knowledge about the change processes in the science system and their impact has been growing apace. Nonetheless, compared to the potential findings, the current state of research remains inadequate. In future, the decisions and courses of action taken by science management and policy should be guided to a greater degree by science-based insight.

Since 2008, therefore, the BMBF has given special emphasis to the promotion of science studies and higher education research. The ultimate goal is to develop a high-performing scientific and university-based research landscape that is inspired by theory and applies empirical research methods. It should be able to compile valid information and develop scientific ana-

lyses, which are a prerequisite for the action of science policy and management. Adopting an interdisciplinary and application-oriented approach, the central topics investigated by scientific and university-based research reflect the range of tasks performed by the science system.

The BMBF's funding scheme is particularly committed to forging deeper ties between research fields that, by tradition, tend to be loosely connected: scientific research and university-based research, which focuses on tertiary education. In future, the two fields are to be considered as one entity. The problems increasingly impact on both research and teaching, while changes in one area have a reciprocal effect.

To date, the following eight funding lines have been published in this BMBF research priority:

- Higher education research as a contribution towards the professionalisation of university teaching
- The economics of science
- Research on the new generation of academics
- Competence modelling and assessment in higher education
- Scientific performance evaluation
- Research accompanying the Teaching Quality Pact
- Academic success and the drop-out rate
- Research on digitalisation in higher education

Moreover, funding has been granted to two projects designed to improve the research infrastructure for scientific and university-based research. They aim to open up greater research opportunities and enhance their visibility on the international stage:

- Founded in 2017, the Research Data Centre (FDZ) of the German Centre for Higher Education Research and Science Studies (Deutsches Zentrum für Hochschul- und Wissenschaftsforschung, DZHW) offers internal and external researchers easy access to anonymised data via different channels.
- The Competence Centre for Bibliometrics operates a quality-assured, in-house data infrastructure for

bibliometric applications, built on the fee-based literature databases Scopus and Web of Science. The Competence Centre is supported by a consortium of seven partners: DZHW, FIZ Karlsruhe – Leibniz Institute for Information Infrastructure, Forschungszentrum Jülich, the Fraunhofer Institute for Systems and Innovation Research ISI, GESIS Leibniz Institute for the Social Sciences, the Max Planck Society and Bielefeld University.

To some extent, university research and educational research explore similar issues on topics such as teaching-learning formats, competence orientation, equal opportunities or approaches to governance. However, owing to the internationalisation in tertiary education (Bologna reform), university education also sets its own priorities. There is an increasing blurring of the boundaries between higher education research and science studies.

### Vocational training

The dual system of vocational training is a backbone of the economy and social cohesion. The BMBF funding initiatives aim to enhance the quality of existing programmes: they should be attractive, future-proof, offer excellent training, open up tailored employment opportunities and thus also ensure social participation.

Tracing the ongoing development of vocational education and training in Germany falls into the remit of the Federal Institute for Vocational Education and Training (Bundesinstitut für Berufsbildung, BIBB). The institute identifies priority VET tasks, promotes innovations on both the national and the international level and proposes new, practice-oriented solutions for continuing professional development.

As a federal institute for research into vocational education and training, the BIBB is a leading player in educational research. The BMBF collaborates closely with the BIBB, for example with regard to the joint initiative, Skills for the digital workplace of tomorrow.

The Digital media in vocational education programme develops and trials the use of new digital solutions, for example workplace-based learning, e-portfolios and open educational resources. It also fosters the improvement of the media competency skills of company-based training personnel. Via the

Sonderprogramm ÜBS-Digitalisierung, a special digitalisation programme, the BMBF is promoting the introduction of digital equipment for training purposes in inter-company vocational training facilities. Pilot projects aim to help adapt teaching and learning processes to the latest technological developments.

### Education for Sustainable Development (ESD) and the Research for Sustainable Development framework programme (FONA)

In 2005, the BMBF launched the framework programme on Research for Sustainable Development (FONA). The BMBF programme pursues the objectives of implementing the national strategy for sustainable development and updating the High-Tech Strategy with regard to the sustainable economy and energy. The UN Decade of Education for Sustainable Development (ESD) started at the same time. In 2015, FONA<sup>3</sup> and the five-year UNESCO Global Action Programme on ESD followed on the heels of FONA2 (2010–2014).

The central elements of FONA<sup>3</sup> are the flagship initiatives Green Economy, the City of the Future and the Energy Transition in Germany, which boast a high degree of application relevance. One of the four fields of prevention research in FONA<sup>3</sup> is Education and research: working together for sustainable development. It is vital both to communicate the latest scientific results and endorse civic engagement; therefore, FONA<sup>3</sup> systematically combines research and education for sustainable development for the first time. As social change moves towards greater sustainability, encouraging citizens to become actively involved and developing decision-making tools have become top priorities. A further objective in this regard is interdisciplinary exchange with educational research.

The FONA<sup>3</sup> framework programme does not fund research into education processes. Within the framework of the UNESCO Global Action Programme on ESD, the BMBF intends to support the development of an ESD-specific indicator to promote research on ESD education processes. In terms of content and topic, both programmes offer considerable common ground for potential research fields in educational research.

### **Transferinitiative Kommunales Bildungsmanagement (Transfer initiative for municipal education management)**

Initiated and financed by the BMBF, with nine transfer agencies in 14 locations, the Transferinitiative Kommunales Bildungsmanagement follows on from the Lernen vor Ort (Local Learning) programme, which has now been concluded. The Local Learning initiative was carried out jointly by the BMBF and German foundations between 2009 and 2014. The programme was a key component of the Federal Government's Advancement through Education qualification initiative to step up and improve education and further training opportunities for all. In 40 administrative districts and independent cities, it aimed to develop a local education management system that facilitates lifelong learning and enables all citizens to achieve educational success.

The Transferinitiative Kommunales Bildungsmanagement continues to pursue this objective. Through data-driven analysis of the local education situation and individual consultations, the transfer agencies work with the municipalities to establish successful education management. Efforts are being made to institute an ongoing education reporting system to identify the need for further action and to be able to respond appropriately.

The transfer initiative is an excellent interface to the Framework Programme for Empirical Educational Research, whose goal is lifelong learning and social participation for all. The focus is on disseminating knowledge: by funding educational research, the framework programme helps to achieve this objective.

### **The Innovation for Tomorrow's Production, Services and Work research programme**

The Innovation for Tomorrow's Production, Services and Work research programme (2014–2020) boasts a high degree of practical relevance. Bolstered by interdisciplinary research, the search is on for practical solutions that will safeguard and increase both value creation and jobs in Germany. Moreover, the results will be instrumental in developing products and services that are people-oriented, environment-friendly and competitive, while ensuring that the manufacturing processes take economic, ecological and social aspects into consideration. Mankind, technology and organisation are viewed as an integral whole to reap the value of knowledge.

With this programme, the BMBF is continuing the programme lines on Research for the Production of Tomorrow and Innovations with Services.

The Future of Work programme (in place since 2016) seeks to advance both technological and social innovations alike. By this means, the BMBF intends to pave the way for better working conditions, secure, new jobs and prosperity through economic success. Without a doubt, technological change calls for new business models and new organisational structures that require employees and managers to obtain different skill sets and qualifications. The importance of education and further training can scarcely be over-emphasised in this context.

As regards the workplace, the Framework Programme for Empirical Educational Research ties in with the field of action on Channelling and exploiting technological advances in the education sector. The results are expected to help shape education processes in such a way that they reflect the changes in the workplace. At the same time, particular emphasis is placed on issues related to education and training.

### **Framework Programme for the Humanities, Cultural and Social Sciences**

In the first Framework Programme for the Humanities, Cultural and Social Sciences from 2012 to 2017, the BMBF actively promoted the internationalisation of the humanities. Other funding priorities included creating autonomy and freedom for researchers and the advancement of early career researchers. The framework programme followed up on the Freedom for Research in the Humanities funding initiative (2007–2012), which introduced new support measures for the humanities. The current funding priorities include regional studies, the expansion of research approaches and fields, the promotion of young scientists and the correlation between cultural diversity and social cohesion.

The Framework Programme for Empirical Educational Research may give research greater momentum by providing new insight in educational research. Projects in the fields "Improving educational equity – recognising and developing individual potential" and "Managing diversity and reinforcing social cohesion" are particularly conducive to achieving this aim.

## 6.2 Research funding mechanisms of the German Research Foundation

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The mission of the German Research Foundation (DFG) is funding basic research. Thus, with regard to educational research, it complements the funding mechanisms of the BMBF, which are geared towards application. From the individual grants programme to personnel funding, right through to the funding of coordinated projects, all DFG instruments may be allocated to educational research. In the DFG's subject classification system, the elected Educational Research Review Board (Fachkollegium 109) is responsible for selecting, evaluating and controlling the quality of project funding on a day-to-day basis. In 2011, the DFG instituted Priority Programme 1646 on Education as a Lifelong Process, funding projects that analyse the data of the National Educational Panel Study (NEPS). The final funding phase of the programme was announced in autumn 2016.

In addition, four workshops have been held in recent years for early career researchers in the field of empirical educational research. They provided specific support to young post-doctoral researchers in formulating DFG applications. Past workshops include a focus on domain-specific educational research in kindergarten, school and university education, Empirical School and Classroom Research, Empirical extracurricular educational research and Secondary analysis of multidisciplinary data sets in educational research. Further workshops for early career researchers are planned.

The DFG is currently funding other large, coordinated projects involving two research groups (FOR): FOR 2242 "Academic learning and academic success during university entry phase in natural and engineering sciences" and FOR 2385 "Facilitating diagnostic competencies in simulation-based learning environments in the university context". These research groups are collaborative projects with a funding period of up to six years.





**Published by**

Bundesministerium für Bildung und Forschung/  
Federal Ministry of Education and Research (BMBF)  
Division Educational Research  
53170 Bonn

**Orders**

In writing to  
Publikationsversand der Bundesregierung  
P.O. Box 48 10 09  
18132 Rostock  
Germany  
E-mail: publikationen@bundesregierung.de  
Internet: www.bmbf.de  
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Phone: +49 30 18 272 272 1  
Fax: +49 30 18 10 272 272 1

**September 2018****Edited by**

BMBF

**Translated by**

Caroline Hörl

**Layout**

wbv Media, Bielefeld; Christiane Zay

**Printed by**

BMBF

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