

AGENDA 2020

Research, Development, and Knowledge Transfer

TABLE OF CONTENTS

1. Introduction	4
<hr/>	
2. Research priorities	5
2.1. Challenges and chances resulting from the demographic change	5
2.1.1 Rehabilitation	8
2.1.2 Centre of excellence for early childhood education	8
2.1.3 Centre of excellence for social work	9
2.1.4 Ambient assisted living	9
2.1.5 Centre for smart energy	9
2.1.6 Institute for interdisciplinary gender research and diversity	9
2.2 Change towards a society obliged to maintain sustainability	10
2.2.1 Materials sciences	10
2.2.2 Agriculture	10
2.2.3 Centre for smart energy	11
2.2.4 Clusters	11
2.2.5 HRM projects	11
2.3 Mechatronics and power electronics	13
2.4 Media and society	16
2.4.1 The mediatized society	16
2.4.2 The Mediendom	18
2.5 Marine and offshore technology	19
<hr/>	
3. The University of Applied Sciences Kiel: a partner for small and medium-sized enterprises (SMEs)	21
<hr/>	
4. Structures	22
4.1 Administrative and organisational structures	22
4.2 Enhancing research capacity	23
4.2.1 Additional teaching load reduction (as governed by official teaching regulations LVVO)	23
4.2.2 Founding graduate schools	23
<hr/>	
5. Future development	24
<hr/>	
Research Agenda 2020	26

1. INTRODUCTION

According to Guidelines 1 and 4, the University of Applied Sciences Kiel clearly defines its position with regard to research and development as well as technology transfer:

1st Guideline: For us, excellent teaching is interdisciplinary, **application-oriented teaching, based on research** and science, and characterised by its internationality and the wide range of methods used.

4th Guideline: Our **application-oriented research and development** is the foundation for our excellent teaching. Our University is a **reliable and innovative partner for businesses and non-profit organisations**.

These guidelines reify Section 3 of the German Higher Education Act (§ 3 Hochschulgesetz). Applied research and knowledge transfer have a long tradition at the University of Applied Sciences Kiel, which has not only completed numerous research projects for government third-party funders, but has also acquired the reputation of being a reliable partner for local small and medium-sized enterprises (SMEs) despite the fact that there was no perceivable concentration on specific research fields in the past. The University of Applied Sciences and the Schleswig-Holstein Government reached an agreement on the objectives for 2009-2013 which, for the first time, stated five priorities that have meanwhile been revised and reworded by the Senate.

Focusing on clusters will, in addition, enable the University of Applied Sciences to gain a more distinct profile in the public eye. To ensure that this profile will be applicable in future, the University of Applied Sciences Kiel has drafted an agenda covering the period until 2020 that will be used as a guideline. It was designed in close cooperation by the heads of the faculties and institutes.

Despite focusing on clusters, the University of Applied Sciences will maintain its consulting services for SMEs, offering its full range of skills.



2. RESEARCH PRIORITIES

According to Section 21 (1) no. 5 of the German Higher Education Act (Hochschulgesetz – HSG) the Senate decides on a university's research priorities. Having discussed these priorities, the Senate decided to pay more attention to five research fields in future: These fields are:

- Challenges and chances resulting from demographic change
- The change towards a society obliged to maintain sustainability
- Mechatronics and power electronics
- The Mediendom (science communication)
- Marine and offshore technology

However, the traditional strength of the University of Applied Sciences lies in its ability to offer professional services for a variety of problems, even beyond the priorities mentioned. This ability is valuable; it is appreciated by the University's partners and is to be maintained. As the 6th (unwritten) priority it is, therefore, always kept in mind whenever plans for the future are on the agenda. The emphasis during transfer is on:

- consulting services for SMEs
- the establishment of application centres: application centres are supposed to transfer innovative research and development resources to SMEs at an early stage, whereby the specific interests of local business partners will be considered. Application centres shall enable graduates to acquire the employment qualifications demanded by business partners.

2.1. Challenges and chances resulting from demographic change

Demographic change confronts society with tremendous challenges. Increasingly, society, the state and businesses are focusing on these issues. The main challenge is the aging society and the simultaneous shift in age groups. As a result of this complicated development, the population will have to face serious consequences in the fields of both production and reproduction. Already today, several faculties at the University of Applied Sciences Kiel are working on these subjects in different fields.

At the Faculty of Social Work and Health, the Centre of Excellence for Social Work, already engaged in research and development in the field of social work, is extending its activities to research issues on rehabilitation and health as well as childhood education.

In the field of **rehabilitation**, the faculty is examining current research issues on health development among the population from the perspective of social science, focusing on different demographic groups:

As part of the government funded project "Social Innovation and Life Quality in Old Age" (SIL-QUA) Professor Gaby Lenz and Professor Marita Sperga are doing research on the *social impact of early-onset dementia*.

Professor Rainer Fretschner is working on *age management and the promotion of health in the workplace in civil service offices* in the state of Schleswig-Holstein.

Professor Heidi Höppner evaluated the *education quality of health care professions in Europe (the GesinE project)*.

Professor Ariane Schorn from the Ministry for Labour, Social Affairs and Health in the state of Schleswig-Holstein was commissioned to carry out the project *“Early Assistance for Pregnant Women and Families with Small Children: Big Hand / Small Hand”*.

In the field of **social work**, the focus is on (quality) development of social services. The objective is to pursue research desiderata and development tasks in order to enable professionals and social facilities to accept and handle the future challenges of demographic change. Excessive demands requiring professional social work often arise as every single person has to create his or her own private and professional living environment and biography. Projects that follow up on the respective research and development policies particularly aim at supporting families and facilities that professionally complement or replace the private reproduction sector.

In cooperation with the University of Applied Sciences Cologne, the project *“Der Allgemeine Soziale Dienst im Wandel”* (“Changing Social Services”) (a research project supported by the Hans Böckler Foundation) is comparing different social services (Professor Ingrid Gissel-Palkovich).

The project BAG ASD views the linking and further professional development of general social services/municipal social services (a federal German association) as a practical task. It also collaborates on shaping legislation (child protection) (e.g.,(Professor Ingrid Gissel-Palkovich).

In a paper entitled *“Personal Responsibility”* (“Die Eigenverantwortung”) Professor Helen Ahlert questions and discusses the educational goal of Section 1(1) of the German Social Security Code - Child and Youth Assistance(hereinafter “SGB VIII”). In addition, the question is raised whether the revision regarding the provision of a legal adviser during court proceedings in Section 158 of the German family law (FamFG) turned out to be a missed chance.

On behalf of and in cooperation with the Department for Economy and Social Affairs in the hanseatic city of Lübeck, Professor Rainer Fretschner is doing research on culturally appropriate care and assistance for the elderly . The project is entitled: *“Migration and Old Age in Lübeck”* (“Migration und Alter in Lübeck”).

The project *“Democracy in Residential Care”* (“Demokratie in der Heimerziehung”) aims at supporting residential care facilities in Schleswig-Holstein to achieve the active participation of young people. Professor Raingard Knauer is supervising this pilot project for the Schleswig-Holstein government, which is funded by the joint initiative *“Schleswig-Holstein – State for Children”* (“Schleswig-Holstein – Land für Kinder”).

In collaboration with six further EU countries and local professional partners in Schleswig-Holstein, the project “Restorative Justice” compares matters of justice among European countries. The emphasis is on mediation processes and the democratisation of social control. ‘Restorative Justice’ methods are also applied in the fields of health, education (mainly schools), environment and political participation (Stuttgart 21).

When reflecting on demographic change, one should not only focus on the aging population. How generations to come are trained for life will be decisive for the sustainability of our communities. In this research field as well, the Faculty of Social Work and Health is working on numerous issues. At the Centre of Excellence for Social Work, childhood education has become a main issue. We intend to expand research on this priority under the roof of a Centre of Excellence.

A number of papers on research and development projects are already available in the field of **childhood education**. In Schleswig-Holstein, only the University of Applied Sciences Kiel is doing research on early childhood education and upbringing. The Faculty of Social Work and Health has drafted curricula for respective courses.

Democratic Education:

Under the roof of the BMBF scheme (Bundesministerium für Bildung und Forschung / “Federal Ministry of Education and Research”) entitled “Extension of the advanced training initiative for early childhood professionals” (“Ausweitung der Weiterbildungsinitiative Frühpädagogische Fachkräfte”) the University of Applied Sciences Kiel has been awarded funding for the project “Key competences of paedagogical professionals in children’s daycare centres for education in a democracy” (“Schlüsselkompetenzen pädagogischer Fachkräfte in Kindertageseinrichtungen für Bildung in der Demokratie”) (Professor Raingard Knauer).

The University of Applied Sciences Kiel has evolved into a Centre of Excellence for research, development and teaching in the field of childhood paedagogy, focusing on designing concepts for and further development and research on education and upbringing in children’s daycare centres and projects for democratic education. In this context, the Faculty of Social Work and Health is also working on the **evaluation of education guidelines for daycare facilities in Schleswig-Holstein (Evaluation der Bildungsleitlinien für Kindertageseinrichtungen in Schleswig-Holstein)**.

This evaluation is to identify the success and difficulties that arise when implementing the education guidelines. It was commissioned by the Ministry of Education and Culture in the State of Schleswig-Holstein (Ministerium für Bildung und Kultur des Landes Schleswig-Holstein) (Professor Raingard Knauer).

The Institute for **Family-owned Businesses** (Institut für Familienunternehmen) at the Faculty of Economics is working on the demographic challenges that companies are facing. The main emphasis lies on the transition in a company from one generation to the next.

FUTURE PROJECTS

The research activities in the field of demographic change that, until now, have mainly been carried out by the Faculty of Social Work and Health are to continue:

2.1.1. Rehabilitation

Based on these previous research activities, the University of Applied Sciences Kiel is scheduling a Master's degree course on rehabilitation which, on the one hand, assumes that candidates have completed research on the curriculum and, on the other hand, researched the topic. The faculty will work on both issues. In the years to come, the University of Applied Sciences Kiel will furthermore strive to acquire additional research expertise in the field of care and physiotherapy.

2.1.2. Centre of excellence for early childhood education

The activities in the field of early childhood education and democratic education are to be pooled in a separate Centre of Excellence.



2.1.3. Centre of excellence for social work

The Faculty of Social Work and Health has sufficient expertise on SGB VIII. This should be pooled in an independent Centre of Excellence in which research should focus in particular on issues on demographic change.

Until now, technical issues have not been of importance to the Faculty, but they do offer possibilities for interdisciplinary research, for example in:

2.1.4. Ambient assisted living

Having been declared a state with expert facilities for health issues ("Gesundheitsland") Schleswig-Holstein is to do research on computer-assisted individual healthcare. The University of Applied Sciences Kiel will strive to draft and apply for funding for respective INTERREG projects. Initial promising results have been achieved in the field of eHealth (Professor Dirk Frosch-Wilke, Professor Marco Hardiman) and Health-Games (Professor Franziska Uhling).

Many of the applications for ambient assisted living require so-called smart/intelligent grids or smart metering. Against this background, there is further reason (cf. Item 2.2) to establish a

2.1.5. Centre for smart energy

This results in a further interface with the priority research on sustainability.

2.1.6 Institute for interdisciplinary gender research and diversity

This institute is well established. After having revised its objectives towards diversity management, it is now in a strong position to work on issues regarding demographic change.

CONFERENCES, CONGRESSES, AND OTHER EVENTS

Following the example in the field of childhood paedagogy, the Centres of Excellence should organise conferences at regular intervals and thus promote lifelong learning in Schleswig-Holstein.

The lecture series that are already being carried out by the Faculty of Social Work and Health as a matter of routine can, in future, be expanded in order to offer lectures in the evenings to enable the working professional audience to take part.

For the past ten semesters, a students' symposium on the utilities industry has been held in collaboration with Vater ESN Business Academy in Schwentinental (Professor Eberhard Hoffmann-Berling, Professor Udo Beer) where topics regarding smart energy are discussed. This event will continue in future.

2.2 CHANGE TOWARDS A SOCIETY OBLIGED TO MAINTAIN SUSTAINABILITY

The University of Applied Sciences Kiel has been engaged in issues regarding the change towards more sustainability for a very long time. Sustainable behaviour is not only limited to using renewable energies, but assumes that individuals and businesses are basically prepared to conserve resources. The University is, therefore, also engaged in numerous fields that are of specific importance for such a reappraisal.

2.2.1 Materials sciences

The more efficient use of resources as well as increasingly complicated demands on materials in all fields require the continuous improvement of existing materials and the development of new ones. There is great potential in the development of intelligent and multifunctional materials and structures. Due to their unique properties, thin coatings and nanostructures, in particular, offer possibilities to optimize functional characteristics or even the potential to achieve entirely new effects using fewer resources. The fields of application for such coatings and structures are wide ranging, from antibacterial coatings in medical technology to thermo-chrome absorbing layers for the solar industry and anti-reflective and non-stick coatings for a variety of applications. Based on these systems, anticorrosive coatings and catalytic structures contribute towards the conservation of valuable resources and environmental protection. Cost-effective, easy production is an important objective when developing the coatings, as well as being a criterion for technical implementation in smaller companies.

Thin and thick coatings and new types of monocrystals for infrared sensors (high-resolution gas analysis in environmental and medical technology) and actuators (high-precision, electrically driven adjustable elements for microelectronics) are a further field of research. Here, too, the close cooperation with businesses will ensure practically useful results.

2.2.2 Agriculture

The Faculty of Agriculture develops integrated concepts for the sustainable production of food plants, fodder and biomass crops in Schleswig-Holstein, taking into consideration the optimal application of all production means (crop protection, bioregulation, fertilisation).

The objective is to promote the economically sensible and ecologically acceptable production of plants both within a global framework and under specific local conditions in Schleswig-Holstein.

At the University of Applied Sciences Kiel, the Food Industry is being established as a new research field. As part of a research project for the Ministry of Energy Turnaround, Agriculture, Environment, and Rural Areas in the State of Schleswig-Holstein (Ministerium für Energiewende, Landwirtschaft, Umwelt und ländliche Räume des Landes Schleswig-Holstein) the future potential of local dairy farming will be forecast. Additionally, members of the Faculty are developing raw material values and market indicators for the food industry. In collaboration with food industry companies in the state, another research project aims at recording the carbon

footprints of products along the entire value-added chain, from farms to shops. In a further project carried out in collaboration with the Federal German Institute for Risk Assessment (Bundesanstalt zur Risikobewertung (BfR)) in Berlin and companies in Schleswig-Holstein, possibilities are being investigated to reduce risks and thus costs along the value-added chain of dairy products.

As part of the Centre of Excellence for the Food Industry, the Faculty of Agriculture in Osterrönfeld closely cooperates with state-owned companies in the food industry, national and international organisations (e.g., the International Dairy Federation) and the ife Information and Research Centre for the Food Industry in Kiel.

2.2.3 Centre for smart energy

Discussions about renewable energies have drawn attention to the efficiency of electric power transmission grids and, at the same time, raised public awareness for the economic use of energy. Efficient use of energy requires smart grids, smart metering and smart homes: in other words, smart energy. This means, however, that IT, communications and energy technology must grow together before energy can be used efficiently. Input has already been provided in this field.

2.2.4 Participation in clusters

As a result of collaboration between different universities in Schleswig-Holstein, research networks dealing with different topics regarding sustainability have already emerged. As a founding member of some of them, the University of Applied Sciences Kiel participates in:

- the Biomass Cluster (Professor Urban Hellmuth, Faculty of Agriculture)
- "CE WindEnergy Schleswig-Holstein" (Professor Alois Schaffarczyk, Faculty of Mechanical Engineering; Professor Hans-Jürgen Hinrichs, Faculty of Computer Science and Electrical Engineering)
- a network for sustainable development of the state Universities of Applied Science in the Federal Republic of Germany (FHD-NE); (<http://rtwe.de/39.html>) (Professor Stephan Schneider, Faculty of Economics)
- the Institute of Man, Labour and Businesses (Institut Mensch, Arbeit, Unternehmen) (Professor Udo Beer, Professor Carl Schütte, Faculty of Economics)

2.2.5 HRM projects

Already today, there are a few Human Resource Management (HRM) activities. Recruitment and development of personnel is one of the very major challenges of demographic change as well as sustainable business management. Since the University of Applied Sciences Kiel will become increasingly involved in the recruiting process, these approaches should systematically be expanded (e.g., job coaching by the Research and Development Centre of the University of Applied Sciences Kiel (Forschungs- und Entwicklungszentrum Fachhochschule Kiel GmbH).

FUTURE PROJECTS

We shall proceed with and expand on all activities described under Item 2.2. Potential for expansion is well conceivable in the field of the Faculty of Economics, because sustainable thinking includes the responsible use of manpower. In order to meet these requirements, existing and future activities should be pooled and report to the Senate. This includes:

- Career Fair (which has been successful for the past 20 years)
- Recruiting (to be established)
- Contacting the 'Hidden Champions' in Schleswig-Holstein
- Setting up an interdisciplinary Institute of Human Resource Management

The University of Applied Sciences Kiel will attempt to pay adequate attention to the economic importance of rail technology and the production of rail vehicles in Kiel.

CONFERENCES, CONGRESSES, AND OTHER EVENTS

The University of Applied Sciences Kiel is already hosting:

- Smart Materials & Structures
- Every two years, Professor Mohammed Es-Souni (Institute for Materials and Surface Technology / Institut für Werkstoff- und Oberflächentechnologie) organises the international workshop "Smart Materials and Structures". This workshop offers a platform to present and exchange information on current states of development in the field of functional materials and nanostructures. Renowned scientists from all over the world present and discuss their research results. An important aim of the workshop is to involve young academics and give them an opportunity to present their results as well as to give them special tutorials.
- Heinrich Freese Seminar (Professor Udo Beer) in cooperation with the the Institute of Man, Labour and Businesses (Institut Mensch, Arbeit, Unternehmen (IMAU)), Zurich.
- A symposium on Smart Energy is in planning (Professor Gerd Stock, Herbert Jacobs, Faculty of Computer Science and Electrical Engineering; Professor Eberhard Hoffmann-Berling, Faculty of Economics).

2.3 Mechatronics and power electronics

The University of Applied Sciences Kiel aims to actively shape the developing paradigm shift towards electric mobility in research and teaching. We shall co-ordinate and engage our manpower and expertise with industrial collaborators and teaching.

Using electric power efficiently is one of our society's significant strengths. Subsequent generations of engineers will have to have outstanding abilities in the creative and responsible use of electric power in order to respond to the challenges caused by the shortage of resources and environmental protection. This expertise can be applied to develop competitive products and procedures and finally develop sustainable and clean mobility.

Power electronics and mechatronics play a key role in mastering the future challenges of electric mobility.

The major objective is to optimize electric components with regard to cost and functionality as well as their integration into the entire system of electric vehicles. This is to be practically tested and shown using meaningful demonstrators. The already existing expertise of the University of Applied Sciences Kiel in this field will be further expanded. This knowledge will be at the disposal of local businesses in order to enable them to further develop existing products into competitive, cost-efficient automobile products with optimised function.

Current projects

- **Vehicle simulation:** as part of the INTERREG IV-A project, an electric vehicle model with real-time capability is being developed that, besides examining the drive components, also looks in particular – at the energy-intensive auxiliary units such as heating and air-conditioning (Professor Klaus Lebert).
- **Hardware-in-the-Loop environments:** in collaboration with industrial partners, environments are being set up that enable the inclusion of hardware components in a simulated environment at an earlier stage (Professor Christoph Weber/Professor Klaus Lebert).
- **Battery management system:** in addition to already existing hardware and software components, new algorithms are to be developed for status forecasts of lithium ion battery systems (i.e. for the charge level and battery health) (Professor Christoph Weber/Professor Klaus Lebert).
- **Model-based software and hardware development of frequency converters** for three phase AC drive systems under robust and efficient conditions. Development of algorithms for sensorless procedures, e.g. to determine the rotational speed (Professor Christoph Weber/Professor Ulf Schümann).
- Development of compact, high-voltage resistant **passive components for power electronics** (Professor Christoph Weber).

- **Optimum thermal management:** the life span and resilience of modules will be increased by redesigning and developing innovative cooling concepts for modules that suffer from power loss (Professor Ronald Eisele).
- **High temperature capabilities of modules:** using innovative build-up and bonding techniques, operation shall be enabled at junction temperatures of up to 300° C. This will allow highest power ratings while avoiding the need for elaborate liquid cooling (Professor Ronald Eisele).
- **Compactness of power devices:** miniaturisation using three-dimensional build-up of power devices will enable innovative concepts for packaging electric vehicles (Professor Ronald Eisele).
- **ProPower:** a large scale German study project in collaboration with the Sinter Laboratory of the University of Applied Sciences Kiel targeted at producing power electronic modules in a way that will be viable for the future (Professor Ronald Eisele).
- **Powerblock+:** funded German research project on oil immersion cooling of future SIC (silicon carbide) modules (Professor Ronald Eisele).
- Development of a **training system** for introducing tools for the functional development of battery management systems in growth markets (industrial collaborator: ETAS GmbH, Stuttgart) (Professor Klaus Lebert).
- Project to assist the merger of development processes for mechanical, electrical and smart components in vehicles (industrial collaborator: AVL GmbH, Graz, Switzerland) (Professor Klaus Lebert).
- Development of **teaching material for university education** in cooperation with Lucas Nülle GmbH; model-based development process for automated code generation for power electronic components using the example of a frequency converter for an asynchronous motor (Professor Christoph Weber).

FUTURE PROJECTS

- **ALEM:** Joint research project. Industrial collaborators are VW, Danfoss Silicon Power, Vishay, Fraunhofer ISIT/IISB, University of Applied Sciences Kiel. Development of propulsion technologies for electric mobility, especially "Bidirectional dc-dc converters for high voltages" (Professor Ronald Eisele/Professor Christoph Weber).
- Establishment of hardware-in-the-loop test stations for the functional development of higher-level control units and energy management systems (Professor Klaus Lebert).
- Demonstrators and training facilities in collaboration with industrial partners in the field of power electronics and electric mobility (Professor Christoph Weber).
- Present and future cooperation in networks.

CONFERENCES, CONGRESSES, AND OTHER EVENTS

- **eMobility Congress at the University of Applied Sciences Kiel (IHK-VDI-FHK-KESH):** If possible, this successful event, hosted by the Centre of Excellence for Electric Mobility in

Schleswig-Holstein (KESH), is to be repeated at one or two-year intervals. It offers a platform for associations, universities, local enterprises and individuals interested in electric mobility to network.

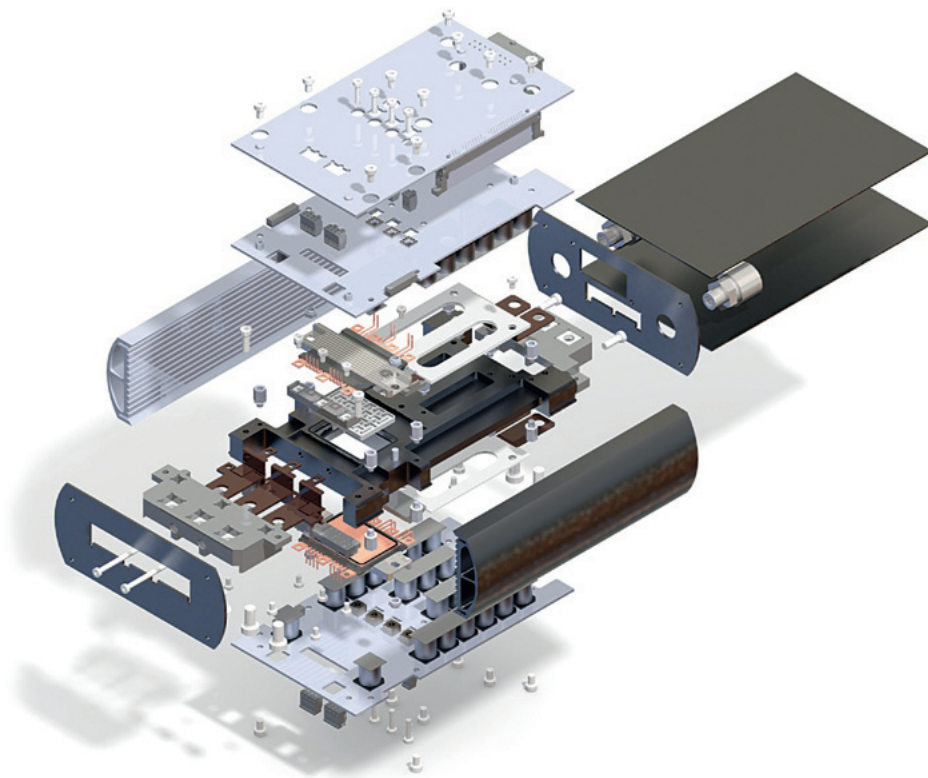
- **PCIM Congress and Fair in Nuremberg:** The Institute of Mechatronics, especially the laboratory for low-temperature sinter technology, presents its research results here. This activity is to be organised and carried out annually, preferably by students.

Centre of Excellence for Electric Mobility in Schleswig-Holstein (KESH)

Participating in several research projects (funded and bilateral) since 2009, KESH has delivered results that gained it the reputation of a reliable and qualified partner. We intend to intensify these successful collaborations in future. To this end, efforts will be made to provide an HR-pool for KESH in order to ensure its continuous, smooth operation and expansion (www.fh-kiel.de/kesh).

Externally, KESH continues to regard itself as a central forum for the discussion of the industry's technical problems. The transfer of know-how will become increasingly relevant, especially for overqualified young engineers.

Internally, KESH will continue to interlink practically oriented teaching and industry-related research results.



2.4 Media and society

The activities of the University of Applied Sciences Kiel in the field of Media and Society are mainly fostered and represented to the outside world by two facilities: the *Faculty of Media and the Centre for Culture and Scientific Communication (Zentrum für Kultur- und Wissenschaftskommunikation (ZKW))*.

2.4.1 The mediatized society

New media technologies are always followed by new offers as well as – in most cases – the larger-scale restructuring of the media industry. Continuously speeding up this process involves chances and risks; but at any rate, it forces society to face new challenges.

The Faculty of Media aims at scientifically supervising the development of new media and their impact on individuals and society. By focusing on applications and applying an interdisciplinary approach to its research on media and communication science, the Faculty of Media regards itself as the predestined partner for political institutions, social organisations and private businesses with specific media-related issues.

As a result, two priorities have emerged that are reflected in the activities of two institutes.

Professor Heidi Kjær, Professor Tobias Hochscherf, Professor Patrick Rupert-Kruse, Dr. Jürgen Rienow, Bob Weber and Isabella Buczek at the **Institute for Immersive Media** (Institut für immersive Medien (IfM)) do research on immersive media, which has been the key focus at the Faculty of Media since 2006. Third-party funds were successfully awarded for this project and, in 2010, a laboratory for immersive media was established.

Immersive media are media whose characteristics at a technical and architectural level (e.g., stereoscopic visualisation, holographic sound system, 360° panorama screen. etc.) embrace the user or dissolve the separation between media and user. The objects of this research are, on the one hand, spatial media (Cave, Mediendom, etc.) and technical media not requiring spatial enclosure (smartphones, augmented reality, etc.). On the other hand, media contents are analysed with regard to their immersive potential, i.e. their ability to incorporate users into projected images, the spatial environment, the story and the virtual world.

FUTURE PROJECTS

We plan to extend the range of research issues regarding immersion and focus on embedding immersive media in everyday life. To do so, a further laboratory is to be established where research will be done on the “immersive living room”. Furthermore, the potential of immersive media (Cave, immersive spatial environments, smartphones, video game consoles, etc.) is to be analysed with regard to innovative concepts for the transfer of knowledge to schools and universities.

Following this and based on already existing collaborations with other universities in Schleswig-Holstein, the establishment of a media research centre is planned. Initial discussions with representatives of the University of Applied Sciences Flensburg and the University of Flensburg are to take place still in 2012.

CONFERENCES, CONGRESSES, AND OTHER EVENTS

The 3rd interdisciplinary conference entitled “illusion immersion involvement” took place at the beginning of November 2012. In future, it will be organised at regular two-year intervals, alternating with workshops and more in-depth colloquia on current research topics.

The “Yearbook of Immersive Media” (“Jahrbuch immersive Medien”) is a peer-reviewed professional journal that is deliberately interdisciplinary and international. Published annually since 2011, this journal publishes contributions in German and English on a specific topic. It is edited by the Institute for Immersive Media (Ifim) at the University of Applied Sciences Kiel. The authors deal with the latest research, both in theory and practice, on immersive media and immersion.

In addition, the festival for spatial media called “COORDINATION” (“KOORDINATION”) was carried out for the first time in 2012 and will, in future, be further developed. Similar to the Career Fair, this students’ initiative is to take place annually.

All of the activities in the field of media studies have been brought together in the **Institute of Applied Communication** (Institut für angewandte Publizistik (IfaP)) where research is done on the use, content and impact of media and special aspects of communication studies. The focus of scientific analysis and prospects is on public relations, journalism and structural changes in the media industry, including the resulting need for action. Among others, one example is the impact of social networking on the communication of political and business organisations. In addition, issues regarding cross-media developments are increasingly moving into the limelight. The Institute assists, for example, with the cross-media strategies of those daily newspapers with which the Faculty of Media is in close contact through its institutional partnerships in the study of journalism. The members of this Institute include Professor Christian Hauck, Professor Tobias Hochscherf, Professor Jörn Radtke, Susanne van Engelen and Christian Möller.

FUTURE PROJECTS

We plan to edit a series, publishing outstanding papers from the University of Applied Sciences Kiel as well as further authors. For this purpose, the collaboration with other universities in Schleswig-Holstein will be intensified and expanded.

CONFERENCES, CONGRESSES, AND OTHER EVENTS

Lecture series and workshops offer a platform for scientific exchange for both students and professionals. Particular importance is attached to the collaboration with foreign partners in the fields of science and business.

2.4.2 The Mediendom

As part of the Centre for Culture and Science Communication (Zentrum für Kultur- und Wissenschaftskommunikation (ZKW)) the Mediendom with its 360° projection dome is the only place in and around Kiel where the public can fly into space as well as dive into the artful blossom of an orchid. From performances for children, e.g. "Lars, the baby polar bear" ("Lars, der kleine Eisbär") to Pink Floyd and U2: you can enjoy the worlds of vision and sound. The Mediendom is one of the few places in Europe where this projection technology is applied and researched. Presently, the ZKW is working on:

- networking with the activities at the Faculty of Media
- networking with the activities at the Faculty of Social Work and Health
 - upbringing in early childhood (performances for children at the Mediendom)
 - implementation of immersive media in the field of therapeutic treatment (e.g., in the context of Kiel aiming to be a dementia-friendly capital)
- implementation of innovative delivery techniques (3D sound and vision in 360° application, gesture technology for immersive rooms)- international networking and the sale of 360° media, e.g. hosting the international Digistar User Group 2014 in cooperation with the Hamburg Planetarium.

FUTURE PROJECTS

We plan to commission the Mediendom to an increasing extent to produce our own films for presentation in the dome.

CONFERENCES, CONGRESSES, AND OTHER EVENTS

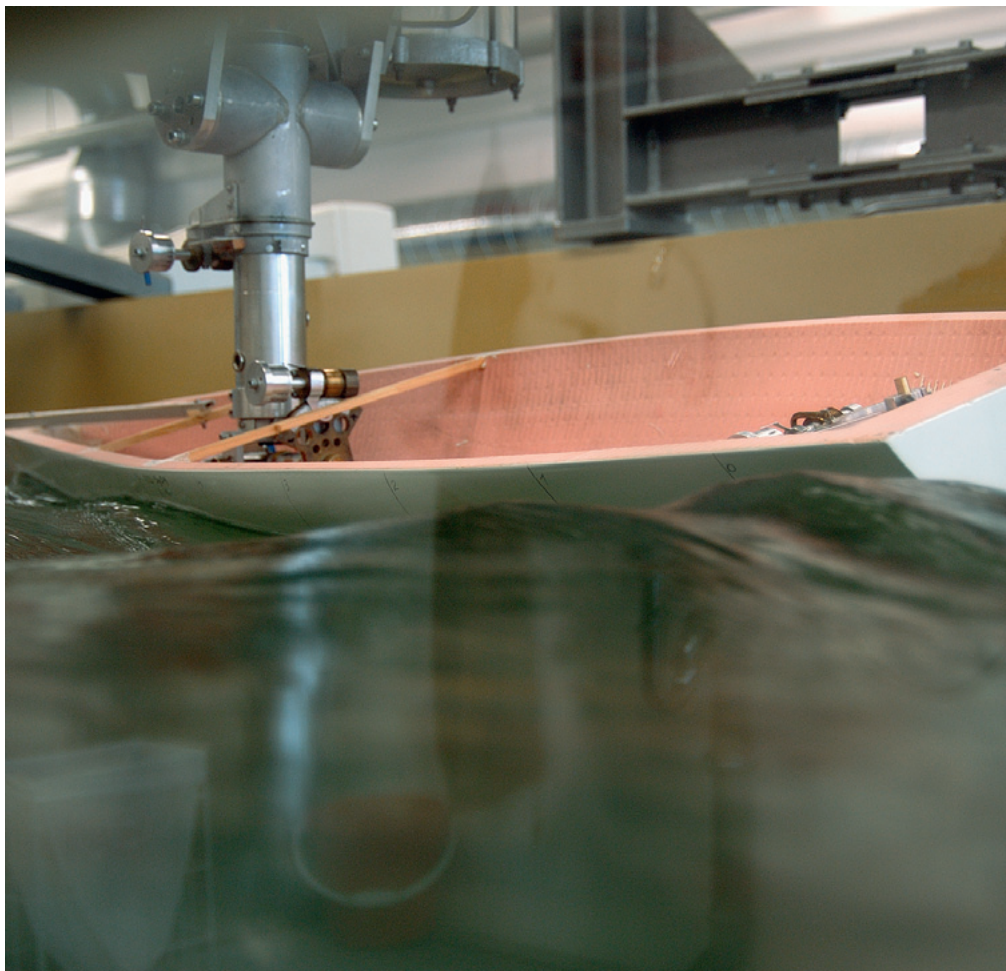
Events for professional audiences in collaboration with the Chamber of Commerce and Industry of Schleswig-Holstein (Industrie- und Handelskammer Schleswig-Holstein (IHK)) and associations such as the Association of German Engineers (Verein Deutscher Ingenieure (VDI)) and the Association of Electrical Engineering, Electronic Information Technology (Verband der Elektrotechnik Elektronik Informationstechnik e.V. (VDE)) would be desirable.

Guided scientific tours should be provided at the computer museum.

2.5 Marine and offshore technology

With regard to research achievements in the field of shipbuilding, it is mainly the Yacht Research Unit (YRU) that stands out. Its twistflow wind tunnel is used to execute important R&D orders for optimising sailing yachts. The ship model basin is a further important laboratory for maritime research. A second research field of the YRU Kiel is the numeric hydrodynamic simulation. The YRU will continue its R&D studies on a long-term basis. Promotion events from the world of professional sailing sports will enable fundraising for further collaborative projects. Additionally, the YRU has its own funds for carrying out R&D projects. We are already collaborating with the TU Delft/Netherlands and are starting to cooperate with the Christian-Albrecht University (CAU) of Kiel. Members of the YRU-Kiel are doing research on scientific developments that also include dissertations on numeric hydrodynamic simulation.

Further research topics in this field include designing and testing sail propulsion.



Research on and the teaching of structural durability has been considerably expanded since 2008. Since then, the necessary theoretical, numerical and experimental capacities have always been modernized or created. Upon completion in 2014 of a development project funded by INTERREG, research and teaching will have reached an international level. Individual research projects on structural durability that were carried out in close cooperation with industrial partners confirm this approach (Professor Berend Bohlmann).

The scientific activities are being run in close collaboration with the Syddansk Universitet (SDU) in Odense, Denmark. As part of a collaboration agreement between the SDU and the University of Applied Sciences Kiel, three Master's graduates from the University of Applied Sciences Kiel are presently taking part in PhD courses at the SDU: two are doing research on problems regarding structural durability; the third is doing research on the use of air bubble curtains as a noise protection device when ramming piles for offshore wind parks.

At present, the Faculty of Mechanical Engineering has demonstrated its ability to pick up on industrial developments and effectively implement them by means of its research on the curriculum for a new degree course in the field of offshore systems technology. Against the background of the significantly growing need for engineers in the offshore sector, a new Bachelor's degree entitled "Offshore Systems Technology" was created.

FUTURE PROJECTS

We shall focus our attention to an increasing extent on offshore systems technology. The main prerequisite for this is the successful endowment of professorial chairs. As soon as the new colleagues have been appointed and set up a sufficient laboratory infrastructure, these capacities are to be combined with those of previous shipbuilding activities in the "Maritime Centre of Schleswig-Holstein" ("Maritimes Zentrum Schleswig-Holstein"), which will be run in collaboration with the University of Applied Sciences Flensburg.

CONFERENCES, CONGRESSES, AND OTHER EVENTS

We would like the "Maritime Centre of Schleswig-Holstein" to become more visible to the public by hosting events.

3. THE UNIVERSITY OF APPLIED SCIENCES KIEL: A PARTNER FOR SMALL AND MEDIUM-SIZED ENTERPRISES (SMES)

Apart from the previously mentioned facilities, the University of Applied Sciences Kiel has a wide range of highly efficient laboratories and facilities in order to promote the transfer of knowledge:

- the CIMTT, etc., which offers rapid prototyping and plant organisation
- the EMV Laboratory, a laboratory for high voltage, and the laboratory for lightning protection systems, which carry out numerous tests for businesses
- the Institute for Interdisciplinary Gender Research and Diversity
- the work group entitled "Supply Chain Management" (Professor Klaus-Dieter Lorenzen)

FUTURE PROJECTS

The consulting expertise available at the University of Applied Sciences Kiel is to be expanded by further consulting centres. To achieve this, we must rely more heavily on the individual skills of our lecturers. The objective is to set up individual centres of excellence.

In order to raise teaching standards, especially at the Universities of Applied Sciences, a Centre for Didactic Methods will be established to provide services for both the University's own and visiting lecturers.

CONFERENCES, CONGRESSES, AND OTHER EVENTS

Development of a Contact Fair with the "Hidden Champions" in Schleswig-Holstein.

The transfer of knowledge and technology from a University of Applied Sciences "within reach" is of great importance for SMEs. Collaborating with smaller companies is not only a prerequisite for many publically and privately funded projects; in addition, collaborating with a University of Applied Sciences that is regionally based offers mutual advantages. Due to this close collaboration for innovations and scientific services, the future of the SME is supported not only professionally, but also often by providing employees if graduates manage to use their project to become integrated in the collaborating company, thereby preventing highly qualified employees from leaving the company. This situation offers both partners a solid basis for projecting future innovative steps and a joint presentation in larger consortia.

4. STRUCTURES

The structures for research, development and knowledge transfer have grown continuously in the past decades. The basic structure is efficient. We wish to mention in particular:

- the technology representative
- the Institute for CIM Technology Transfer (Institut für CIM-Technologietransfer (CIMTT))
- the Research and Development Centre at the University of Applied Science GmbH Kiel (Forschungs- und Entwicklungszentrum der Fachhochschule Kiel GmbH (FuE-Zentrum Kiel GmbH))
- the offshore-research platforms FIN01 and FIN03
- our participation in “CE WindEnergy Schleswig-Holstein”
- our participation in the Kiel Centre of Innovation and Technology (Kieler Innovations-und Technologiezentrum (KITZ))
- our participation in the Patent Agency and IP Management for Scientific Facilities in Schleswig-Holstein (Patent- und Verwertungsagentur für die wissenschaftlichen Einrichtungen in Schleswig-Holstein GmbH (PVA SH GmbH))
- our privileged partnership with the University of Applied Sciences Flensburg and the Faculty of Technology at the Christian-Albrechts-University of Kiel
- our collaboration with universities in order to ensure academic supervision of PhD students

FUTURE STRUCTURES

4.1 Administrative and organisational structure

The following structures support actively researching members of the University of Applied Sciences Kiel: a vice president who is responsible for research project management, a representative for technology transfer, staff for project-related tasks in the Finance and HRM Departments. In addition, the Research and Development Centre at the University of Applied Sciences Kiel GmbH provides a support structure that is close to the campus. It offers and carries out transfer projects and third-party funded projects as well as testing and metering services by and with members of the University.

In order to meet the future requirements of networking and fundraising, we intend to intensify existing supportive measures and will, therefore, establish a “Third-party-Funding Service Centre” (“Drittmittel-Service-Zentrum”). Especially fundraising for international projects (INTERREG programmes, framework programmes for research and technological development), which requires comprehensive preliminary work, can only be carried out successfully if the appropriate services are available.

If indicated, it might in addition be possible to organise the Centres of Excellence as independent institutions or organisations.

4.2 Enhancing research capacity

Two steps must be carried out in order to enhance long-term research capacity at the University of Applied Sciences Kiel:

4.2.1 Additional teaching load reduction (as governed by the Schleswig-Holstein official teaching regulations (LVVO))

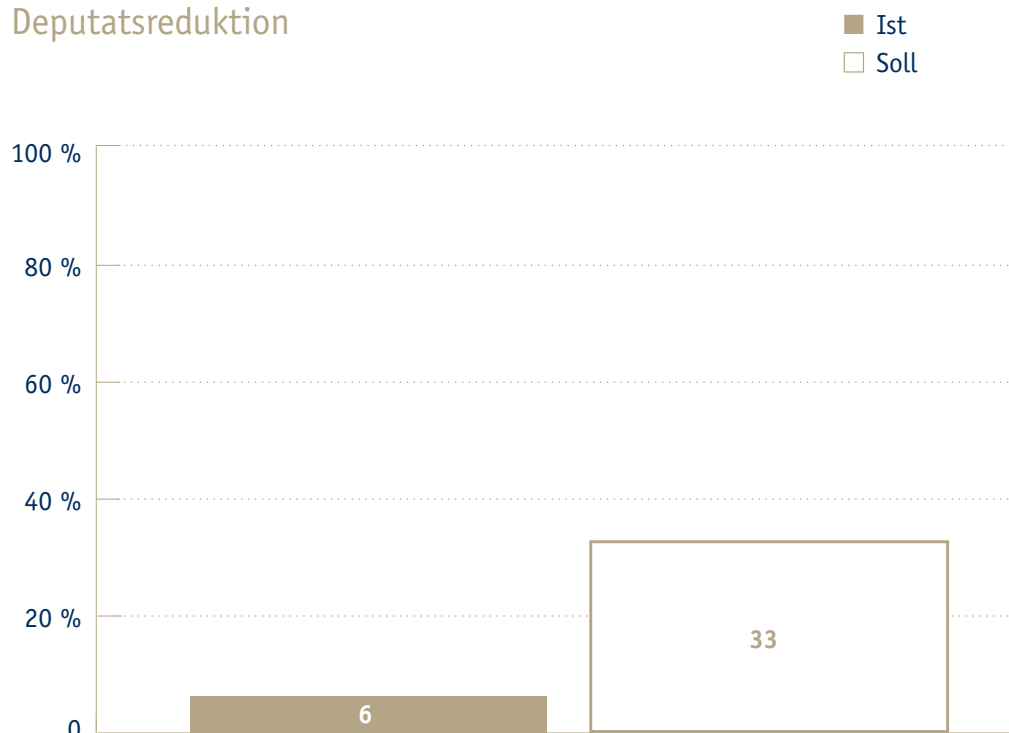
The present teaching load reduction of 6% (Section 8(4) LVVO) will not be adequate if the Universities of Applied Sciences are to develop into long-term supporting facilities for SMEs. Long-term planning aims at professors at Universities of Applied Sciences adopting the job profile of lecturers at universities. As a result, the teaching load would be reduced from 6% to 33 %.

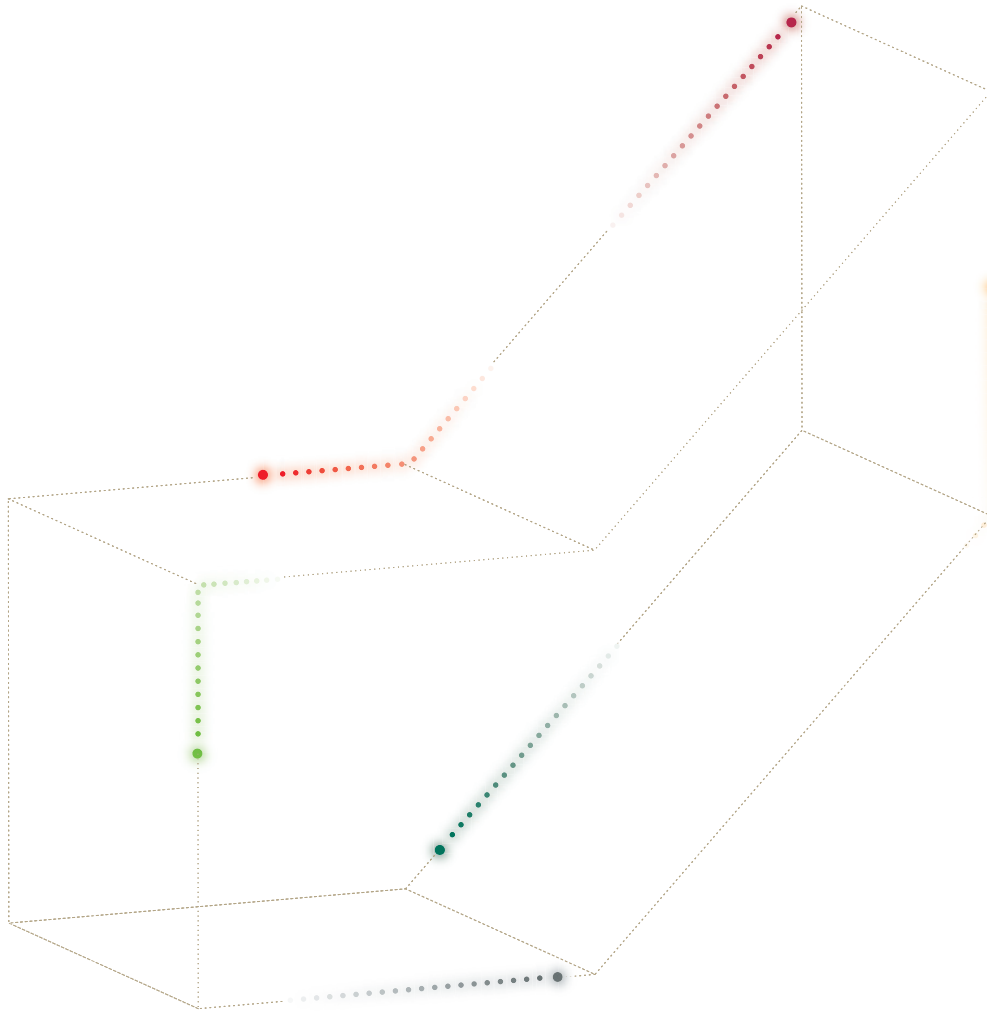
4.2.2 Founding graduate schools

Should the Universities of Applied Sciences be involved in doctoral programmes of universities to an increasing extent or be granted their own right to award doctorates, post graduate students could enhance the research capacity of professors.

Additional teaching load reduction as governed by the German law on official teaching regulations (LVVO)

Deputatsreduktion





5. FUTURE DEVELOPMENT

Constructive measures must be developed, which distinctly link the quality features of teaching and research and successfully transport the respective feedback in both directions.

The future development of the University of Applied Sciences in the field of research and knowledge transfer starts with being integrated in the region, receiving mainly national funding while, simultaneously, being oriented in both an international and an interdisciplinary manner, as well as a high proportion of application orientation when conducting research and service projects. Working at an international and interdisciplinary level will continue to be the aim of this development.

Interdisciplinarity

The variety of professional expertise concentrated in the six faculties provides good internal prerequisites for a development towards more interdisciplinarity. By promoting the collaborative projects of researchers from the engineering faculties with those from the Faculties of Economics and Social Work and Health, the University of Applied Sciences aims at gaining a reputation for being an interdisciplinary trouble-shooter in problem areas ranging from innovation, financing and social acceptance to sustainability.

Collaborating with other Universities of Applied Sciences and research institutes, these internal interdisciplinary experts will complement one another. For this purpose, partnerships with other institutions will continue to be fostered and intensified.

Internationality

The difference between the development towards more internationality in the field of research and transfer and local or national projects is much more than simply inviting partners from abroad. It also requires developments on two levels: a learning process with regard to the differences in scientific and communication culture as well as an expansion of funding criteria.

Due to the increasing internationality of their projects, those individuals and groups doing research at the University of Applied Sciences are being confronted with grading systems whose criteria span from application orientation and collaboration with large and small industrial partners to scientific excellence by means of the ability for basic research.

As a result of participation in European projects with links to the region (INTERREG IV-A) the University of Applied Sciences has already successfully completed such a learning process, which is the start for a future line of development aiming at increased internationality. The focus of this development lies on the transfer of existing networks to a broader international level and the acquisition of expertise in international research funding procedures.

RESEARCH AGENDA 2020

EXISTING AND FUTURE CENTRES OF EXCELLENCE

Challenges and chances of demographic change	Change towards a society obliged to maintain sustainability	Mechatronics and Power Electronics
Rehabilitation	Materials Sciences	Kompetenzzentrum Elektromobilität Schleswig-Holstein (KESH)
Centre of Excellence for Early Childhood	Agriculture	
Centre of Excellence for Social Work	Centre for Smart Energy	
Ambient assisted living	Collaboration in Clusters	
Institute for Inter-disciplinary Gender Research and Diversity	HRM projects	

Words in **bold** = existing core research
 Normal print = core research in planning

Media and Society	Marine and Offshore Technology	Partner of SMEs (Services)
<p>The mediatized society</p> <p>Institute for Immersive Media (ifim)</p> <p>Institute for Applied Journalism (IfaP)</p>	<p>Maritime Centre of Schleswig-Holstein</p>	<p>F&E GmbH</p>
<p>Science communication</p> <p>Mediendom</p>		<p>CIMTT (including possibilities for rapid prototyping)</p>
		<p>EMV Laboratory</p> <p>Laboratory for Lightning Protection Systems</p> <p>Laboratory for High Voltage</p>
		<p>Individual Centres of Excellence</p>
		<p>Centre for Didactics</p>
		<p>Working Group for Supply-Chain Management</p>
		<p>Institute for Family-owned Businesses</p>

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