Development of instructional learning material based on competencies for an inland waterway transportation learning platform at bremenports

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Date: 05.06.2019
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Wordcount: 14994
Abstract

Due to increasing transport volumes in Germany and Europe, the demand for alternative ways of transport is rising. The free capacities on the waterways are not fully exploited partly because students are no longer aware that inland shipping is an alternative. Therefore, this project aims to support bremenports in the development of a learning inventory for logistic students in Germany by identifying competency gaps between the logistics higher education institutions and the industry as part of the #IWTS 2.0 project, co-founded by the EU Commission.

To identify possible competence gaps and select suitable learning materials, nine semi-structured expert interviews were conducted with industry and educational professionals. Further, secondary research as curricula, and online databases from the Hanze media library were used.

The analysis showed that inland navigation is hardly taught in logistics. Eight competencies were identified that should be taught: Selecting a mode of transport, develop multimodal transport solutions, plan holistic transport concepts, selecting handling technologies, showing environmental awareness, dealing with innovation and digitalisation, and showing endurance. The competencies should be divided into learning objectives, taught in chapters through a mix of materials.

Concluding, it can be said that a large competence gap concerning inland navigation exists, which should be addressed through learning outcomes on the e-learning platform using different materials. It is recommended to develop an asynchronous e-learning portal with a multimedia presentation of information, to develop PowerPoint, movies, case studies, realistic tenders, problem-oriented tasks, field reports by industry representatives, a practitioner as a role model, and a chat.
Executive Summary

The aim of this project is to support bremenports in the development of a learning inventory for logistic students in Germany by identifying competency gaps between the logistics higher education institutions and the industry. It is part of the #IWTS 2.0 project, co-founded by the EU Commission Project Interreg North Sea Region, to strengthen the inland waterway transportation industry in the long term and to offer an environmentally friendly transport alternative that contributes to relieving the infrastructure until 2020. bremenports is the public infrastructure manager for the ports of Bremen and Bremerhaven.

To identify a possible competence gap, identify the expectations of the industry and to define suitable learning material, university curricula were investigated and semi structured interviews conducted with nine people from industry and education. Further, different online data banks from the Hanze media library as well as google scholar and textbooks were used.

The results of the interviews and the literature show that currently, inland navigation is only taught to a very small extent, if not at all, in logistics study courses and business administration programs. This is due to a bad image, unawareness of the lecturers, or the assumption that the students already possess this knowledge. Based on the expectations of the industry, eight competencies could be identified that future logistics decision-makers should possess. Logistics students should be able to select a mode of transport, develop multimodal transport solutions, plan holistic transport concepts, select transshipment methods, show environmental awareness, deal with innovation and digitalisation, and show endurance to break new ground and to take current factors into account. Competences must first be divided into learning outcomes, as competences cannot be measured. The learning outcomes should then be taught using different materials on an asynchronous platform in small chapters and with the connection of graphics and words, with a strong reference to reality.

Concluding, there is a large competence gap in relation to inland waterway transport which is to be addressed by the use of learning outcomes based on the competences through a mix of different materials on the online platform.

Resulting from the findings, it is recommended that bremenports develops an asynchronous learning portal with a multimedia presentation of information and develops PowerPoint presentations, movies, and case studies, based on internal material and material from project partners of #IWTS 2.0 in the short term. In the long term, realistic invitations to tender, problem-oriented tasks, field reports by industry representatives, a practitioner as a role model and a chat are advised to develop.
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1. Introduction

Today, an increasing number of goods are being shipped worldwide (Ortiz-Ospina, Beltekian, & Roser, 2018). This applies in particular to Germany as a transit country and to Europe in general. The infrastructure is reaching its limits and cannot grow as fast as the volume of traffic. The capacities on the roads are to a large extent exhausted (Bundesministerium für Verkehr und digitale Infrastruktur, 2019). In addition, 75% of all Europeans live in cities, which further increases the volume of traffic (European Union, 2016). This not only leads to high air pollution in the cities and an increased background noise, but also disrupts the smooth flow of logistics. The modal split in Europe is distributed relatively constant, in the year 2016 76.4% of all freight transports were transported by road, 17.4% by rail and only 6.2% of the goods were transported by inland waterways (eurostat, 2018). In Germany, approx. 12.8% of goods are transported by inland waterway vessels (Logistikbranche, n.d.). In addition, there is the instability of bridges, which will no longer be able to withstand heavy loads and continuous truck traffic in Germany in the long term (Pauly & Stotz, 2018).

Due to this current situation, alternatives for road transport are being sought increasingly. The European funded Interreg North Sea Region Project #IWTS 2.0 (Inland Waterway Transport Solutions) with its concept tries to redirect the transport of goods from the road to the inland waterways and to strengthen the inland waterway economy (Interreg North Sea Region, 2019). Already today inland navigation in Germany transports 197.7 million tonnes of goods (Statista GmbH, 2019) on a total waterway length of 7300km (Bundesverband der Deutschen Binnenschifffahrt e.V., 2018). Nevertheless, there are still valuable free capacities on these waterways. As an alternative to road transport by truck, the inland waterway vessel offers a quieter, cheaper, environmentally friendly and reliable option, since on average the load of 100 trucks fits on one inland waterway vessel (Interreg North Sea Region, 2019) (Inland Navigation Europe, 2019). The port management company bremenports is part of the Interreg project and works together with partners from the UK, Sweden, the Netherlands and Belgium on the #IWTS 2.0 project (Inland Waterway Transport Solutions).

The bremenports GmbH & Co. KG is the public infrastructure manager for the ports of Bremen and Bremerhaven and was founded in 2002. The company acts as a consulting and engineering company and operates its own port. They are responsible for port development, the planning and implementation of construction projects and the maintenance and operation of maritime infrastructure. At the same time, they also market nautical-technical and ecological know-how domestically and abroad and are therefore partners in international projects (bremenports GmbH & Co. KG, n.d.).
The #IWTS 2.0 project addresses in particular the following four points: the low awareness about the opportunities inland waterway transportation offers, low innovation for smaller vessels, the lack of knowledge about the use of smaller waterways and the lack of training (Interreg North Sea Region, 2019). Especially the low awareness of inland waterway transportation, hereafter IWT, might be the reason why it does not exploit its full potential. Although, IWT offers cost-effective and climate-friendly hinterland transport alternatives.

It is assumed that one reason for the lack of awareness is that the topic of inland navigation is not sufficiently reflected in the logistics studies. Therefore, future decision-makers are not well informed about inland navigation as a mode of transport. This eventually leads these future decision-makers in the logistics industry to focus solely on the road and rail for transport, causing a too high traffic volume, especially on the roads, which will not be bearable in the future.

To address this problem at its root, it is essential to determine which competencies students should acquire during their studies and to investigate what kind of learning material should be developed for the online learning inventory of bremenports, on the base of which they can develop these competencies on a voluntary basis.

The purpose of this project is to support bremenports in the development of a learning inventory for logistic students in Germany by identifying competency gaps between the logistics higher education institutions and the industry. As part of the #IWTS 2.0 project, co-founded by the EU Commission Project Interreg North Sea Region, to strengthen the inland waterway transportation industry in the long term and to offer an environmentally friendly transport alternative that contributes to relieving the infrastructure until 2020.

A successful implementation could lead to a better and stronger use of the advantages of inland navigation by students acquiring missing competencies that will allow them to be aware of inland waterway transport as a mode of transport later in their career.

In the following, the graduation project will discuss literature on competencies and e-learning. Based on the literature, the conceptual framework of the research is developed and explains the further investigation of the research. This section is followed by the methodology, explaining and justifying the type of research being conducted in the context of this report. Afterwards, the analyses of the expert interviews follow, which will give an insight on the current situation based on experts of universities and an insight on the expectations of the industry professionals. In addition, the analysis and discussion part address possible learn inventory as part of the e-learning platform, from which the conclusion of the work as well as the recommendations for bremenports are derived in the end.
2. Literature Review

The following chapter covers existing literature in the field of e-learning and identifying and developing competencies. The literature review will give a deep insight into the topic, and present and analyse existing models and frameworks. Furthermore, it will be the foundation for the progression of a conceptual framework that will guide the further research of this project.

2.1 E-Learning

E-learning has become an increasingly important topic for educational institutions as well as companies recently. It is a valuable learning and teaching mode and was acknowledged as an efficient and effective learning method (Gros & García-Peñalvo, 2016). According to Laušević, Štulina, Vučić, and Bartula (2017), the rapidly growing popularity of e-learning is mainly influenced by the rapid development of technology, globalisation, connectedness, cost-effectiveness, time-saving issues, and for commodity reasons.

However, Rossi (as cited in Arkorful & Abaidoo, 2015) states that the concept of e-learning describes a variety of applications, learning methods, and processes. Furthermore, Arkorful and Abaidoo (Arkorful & Abaidoo, 2015) have dealt with numerous definitions of different authors about e-learning and point out, how “[...] difficult it is to find a commonly accepted definition for the term e-learning” (Arkorful & Abaidoo, 2015).

By contrast, Gros and García-Peñalvo (2016) define the term e-learning as learning that is entirely delivered online and technology that imparts the learning process. Further, e-learning implies that the students and the lecturer do not have to be at the same place at the same time.

Another definition is provided by Clark and Mayer who define “e-learning as instruction delivered on digital device [...] that is intended to support learning” (Clark & E. Mayer, 2016). As e-learning can be an inclusive term and there is no unified definition, the latter is used for this research because the scope is limited to the instruction design of material on an online platform. It is aimed to discover, which form of materials should be used to convey the previously identified competencies.

The use of e-learning offers many advantages, it is cost-effective, time-saving and allows the user to study at its own pace. The student is free to decide about the time he/she spends with the material and when to study. Besides, e-learning is cost-efficient for the institutions, several people can learn at the same time since no trainer needs to be physically present, no venues have to be rent, and the material does not have to be delivered (Laušević et al., 2017).
Two different forms of e-learning exist, first the self-study on demand designed e-learning which is called asynchronous e-learning. Second, the unstructured e-learning form which is presented at a specific schedule and is called synchronous e-learning (Clark & E. Mayer, 2016). Due to the scope of the research and the intended outcome for bremenports, an asynchronous e-learning portal is aimed for. This type of learning provides users, to learn at their own pace, and to access the training on their own at any time and any place. Moreover, Clark and Mayer (2016) highlight that e-learning helps the user to generate knowledge and new skills connected to individual learning goals or to improve organisational performance.

An important part of the e-learning is the selection of suitable e-learning material for the learning inventory. Clark and Mayer recommend using a combination of word and graphics, instead of words alone based on cognitive theory (Clark & E. Mayer, 2016). This is referred to as multimedia presentation. For that purpose, it is important to not only select a graphic as an add-on but consider how the text and the graph could add value together. Multimedia presentations are recommended because it stimulates active learning, “when learners mentally connect words and pictures, they are engaged in meaningful learning that is more likely to support understanding” (Clark & E. Mayer, 2016). Additionally, one should be careful in the selection of graphics and rather use organisational graphics that illustrate relations between topics or transformational graphics that show a transformation or development instead of decorative graphics that do not add a specific value to the learning process.

When presenting words and graphics at the same time, Clark and Mayer suggest using spoken words (audio) instead of printed words, especially if the graphic is complex. This is because students may receive an overload of visual information and cannot process the graphic and text at the same time (Clark & E. Mayer, 2016). However, one should not mix written and spoken text with graphics at the same time. Further, one should only include necessary information otherwise it could prevent the actual learning goal and have a negative effect on the learning process.

Furthermore, a friendly and personalised tone should be used for the designing of learning material to enhance the learning process. The learning content should be divided into smaller parts to avoid an overload of new information. As an important part of the learning environment one should include a worked example that illustrates how a situation was solved in real life and enables the student to acquire knowledge and skills. Apart from that, students value interaction of the website as for example questions that they have to respond to and engage with while receiving feedback for it. Additionally, interaction might also take place, even for an asynchronous e-learning portal, if the students can connect with each other for example via chats (Clark & E. Mayer, 2016).
Even so, one should consider the simple rule of e-learning: less is more and that restrains like the budget and technological knowhow play an important role in the development of an e-learning platform (Laušević et al., 2017). Štulina et al., therefore, recommend to use powerpoint as a tool because the instructor as well as most users are familiar with the program and it offers great opportunity to develop materials, as for example case studies, presentations with narration, or videos. Besides, a unified look of the material and the platform is essential for the success of the program (Laušević et al., 2017).

Nevertheless, the authors Ali, Uppal, and Gulliver (2018) examined 259 papers on e-learning and identified 68 unique barriers to e-learning implementation. These barriers include, among others, missing user motivation, technological issues, like bad internet connections or issues during the implementation of the e-learning portal. Further, the absence of face to face interaction might cause a problem and lead to a kind of isolation for the user. E-learning gives the user the freedom to decide when to use the material, but this might cause a priority conflict and lead to the user not devoting enough time to learning. A result might be that users do not work diligently enough as part of the absence of an instructor (Ali, Uppal, & Gulliver, 2018). However, it should be emphasised that the barriers were specially developed in relation to online education for students as part of their studies and correspondence with lecturers and are therefore not entirely applicable because the learning content of bremenports is created on a voluntary basis for students and young professionals interested in continuing their education.

The ADDIE Model is one of the most popular models used for developing e-learning programs and is mentioned frequently. It consists of the five phases analyse, design, development, implementation, and evaluation. Although the model was already developed in 1975, it is extremely popular and used by many trainers, universities and companies which confirms that the model is still widely accepted today (Mayfield, 2011). Furthermore, Mayfield (2011) emphasises that the model is more of an umbrella model and does not have prescribed steps to follow. This makes it easier to use and customise the model for one’s own purposes.

In the model one step builds upon the next, only when all steps have been done, the process can start again from the beginning. Critics complain that the linear structure is the greatest weakness of the model (Chen, 2016). This approach assumes that each step of the model is executed correctly and that no errors occur, as the evaluation takes place at the very end. Additionally, it does not embolden inspiration (Chen, 2016). Nevertheless, the model can serve as a good template, as it has the function of an umbrella model. For the scope of this work, the ADDIE model cannot be used, because the author could only adopt the first two steps of the model. However, in the further development of the program that will be done by bremenports the model could serve as a support. As the parts analyse and the
design of material were done within this research and bremenports could continue with the further steps’ development, implementation, and evaluation.

*Figure 1 ADDIE Model*


Whereas the ADDIE model is a prevalent model and widely used the authors Laušević et al. (2017) introduced an approach to develop an e-learning portal that builds specifically on competencies.

The combination of competencies and the development of the e-learning portal is precisely related to the research of the graduation project. In addition, the approach of Laušević et al. (2017) ends with the selection of appropriate learning materials. This exactly defines the scope of the research and enables the author to derive a conceptual framework for the research. Therefore, this approach will be described and analysed later in this chapter as part of the conceptual framework.

**2.2 Competencies**

The e-learning portal for bremenports will be based on necessary competencies that students should acquire to be aware of inland waterway transportation as a mode of transport. Therefore, a definition for the term “competencies” is provided, the importance of competencies, and literature that has addressed the concept.

In the last few years, competencies have become increasingly important for companies and thus also for entire industries. The reason for this is the globalisation, individualisation, digitalisation, and increasing competition according to Tripathi and Agrawal (2014). According to Shippmann, “[…] the fact is they (competencies) have become so fully embedded in the language and practice of business and the world of work they are here to stay” (Shippmann, et al., 2006).
However, it proves difficult to find a consistent definition for the term competencies. The concept is very broad in literature and is therefore used vaguely. According to Dr. Neumann, this could be due to the characteristics of competencies that are difficult to analyse and operationalise and can therefore be interpreted relatively freely and openly (Neumann, 2015). Additionally, Chouhan and Srivastava state, that “those who spend efforts in examining competency are immediately struck by the lack of uniform definitions, compositions, and methodologies which, of course, lead to misunderstanding, wandering, and waste” (Srivastava & Chouhan, 2014). For a long time, the literature has discussed whether competencies can be identified by the combination of knowledge, skills, abilities, and other characteristics, or as a measure of a person’s behaviour and abilities. The latter refers to the breadth of the concept of competence and whether broad characteristics should fall under it, such as conceptualisations, including motivation, beliefs, values, and interests (Agrawal & Tripathi, 2014).

Many authors have defined the term competency model in recent years, and while there are sometimes very different viewpoints, many authors have agreed on the following definition: “Competency models refer to collections of knowledge, skills, abilities, and other characteristics (KSAOs) that are needed for effective performance in the jobs in question” (Campion, et al., 2011). “The competence itself is a knowledge, skill, ability or other characteristic (e.g., trait, mindset, attitude), commonly referred to as a KSAO, or a group of characteristics, which, when applied in the appropriate roles, help achieve desired results” (Society for Human Resource Management, 2019).

Hasa defines knowledge as “the theoretical or practical understanding of a subject”, skills as “the proficiencies you develop through training or experience”, and ability as “the quality of being able to do something” (Hasa, 2016).

Competencies can be distributed in different competence dimensions. Dr. Neumann emphasizes that there is also no uniform and clear differentiation between the competence dimensions. She follows the diversion into technical, methods, social and personal competencies based on numerous authors such as Berthel, Becker and North (Neumann, 2015). Technical competencies refer to the knowledge, skills and abilities that are required for the goal-oriented and appropriate fulfilment of a specific task. Methodical competencies refer to the ability to use cognitive abilities flexible and across situations to be able to master complex new tasks. The last category of social and personal competencies refers to the ability to act in a social context, which is particularly acquired through dealing with social situations and through experience and personality (Neumann, 2015). Further competencies can have different levels of importance, core, key, and critical competencies. The core competencies are the ones that every employee in an organisation needs to succeed, however, in the case of this project one must adopt this to the logistics industry in general. Second, the key competencies are important to be able to meet the strategic demand of a company, or in this case the industry of inland waterway...
transportation. Key competencies are also often referred to as functional competencies, whereas, the critical competencies are the ones without which it is not possible for the company to achieve its goals (Sturgess, 2012). As these terms and their meanings are very close to each other, this project focuses on the subdivision of competencies into core and key.

A focus is laid on competencies in this research because they are more lasting than a job description (Rothwell, 2019). According to Vu (2017), the academic field of HRM witnessed a transformation from the job and task-based systems to a competency-based system and that it is commonly used by most organisations to achieve greater organisational performance. The Society for Human Resource Management (2019) specifies that "competencies contribute to individual exemplary performance that increases the likelihood of a positive impact on organisational outcomes" (Society for Human Resource Management, 2019). Additionally, Rothwell (2019), mentions that traditional human resource practices are focusing on job descriptions. However, these descriptions are solely about the job and not the person who is supposed to do the work.

Furthermore, “competencies help simplify the process of tying concrete examples of performance expectations to organisational or professional mission and goals” (Society for Human Resource Management, 2019).

However, critics of the concept in most cases refer to competency models that are specially developed for companies. One of these weaknesses is that the process of aligning competencies with the strategies of companies, their mission and vision can take a very long time (Benayoune, 2017). Jamil criticises that the adoption of competencies and effective performance are being represented as a link that can be measured and verified. However, Jamil is explicitly concerned with competencies in the field of management and therefore criticises the “over-simplification of the complex nature of managerial roles” (Jamil, 2015), which do not play an explicit role in this project.
In 2000 Yeh introduced a comprehensive needs assessment process for the development of competency-based training. Tao, Yeh and Sun (2006) adapted the model to their research on improving training needs and assessment processes via the internet in 2006. The model is composed of three phases, the identification of the company's core competencies, the task analysis and needs assessment, and the design of the learning curriculum. It aims to connect the organisational goals with the individual competency needs by identifying the company’s mission, vision, and strategy. The core competencies are filtered out of these elements. This assumes that the core competencies support the strategy of the company. On the bases of the competencies, the tasks are being analysed to identify the knowledge, skills, and abilities of the competence (Yeh, Tao, & Sun, 2006). This is followed by the needs assessment to identify the gap between the “expected” performance and the “current performance”. Based on the identified gap the learning curriculum is being developed (Tao, Yeh, & Sun, 2006).

Figure 2 A framework for competency-based training needs assessment

Reprinted from “Improving training needs assessment processes via the Internet: system design and qualitative study,” by Tao, Yeh, and Sun, 2006, Internet Research Vol. 16 No. 4. Copyright 2006 by Emerald Group Publishing Limited

The author Campion offers a similar approach, he is quoted in many journals and reports on competency models, and his model is mentioned frequently in literature. In the framework for competencies, the first layer is to identify the companies, mission, vision and strategy. According to
Campion (2011) it is of high importance to tailor the competencies to the organisation because "successful competency models also identify competencies that align with corporate strategy and foster competitive advantage" (Campion, et al., 2011). From the first step the core competencies are being identified and in the following categorised for job families. Afterwards, competencies are divided into technical and leadership sections and further developed to behavioural indicators. The behavioural indicators are the bases to measure the performance. A direct link is being highlighted between the performance metrics and the vision, mission and strategy of the company to ensure that the results being achieved are supporting the first identified strategy and vision of the company (Campion, et al., 2011).

*Figure 3 A Framework for Competencies*

Reprinted from doing competencies well: best practices in competency modelling, by Campion et al., 2011, Personal Psychology Vol. 64, Copyright 2011 by Wiley Periodicals Inc.

Both models cannot be used entirely for the sake of this research project. Nevertheless, adoptions of the models will be made and used in the conceptual model. Since the development of competencies is not part of a job/task description in one particular company but is supposed to be applicable to young professionals in the logistics industry, the first part vision, mission, and business strategy need to be adapted to the context of the EU Commissions goal to strengthen the inland waterway transportation industry and the expectations of the industry. Furthermore, the competencies will already be restricted to a specific job area and do not need to be categories in different job families. Nevertheless, the models give a better insight into the identification and development of competencies and build a foundation for the conceptual framework, later discussed in this chapter.
2.3 Theoretical Framework

The concept of the framework is based on the book “From Knowledge to Competencies” by Laušević, Štulina, Vučić, and Bartula in 2017. In contrast to the models and frameworks introduced before, the literature provided by Štulina et al. (2017) does include the development of an e-learning portal and the analysis of competencies. Competencies are a vital component of the research being conducted and are, therefore, essential to include in the development of the portal. Moreover, the research is current which is important regarding the fast pace the internet environment is changing. The model was minimally adapted and extended.

The theoretical framework starts with the analysis of the competencies by identifying the competency gap. Analysing the curricula of logistic students in the North-West of Germany and interviews lead to determination which competencies are currently taught regarding inland waterway transportation. As an additional source expert interviews are conducted with lecturers in higher education and experts of the industry to find out which competencies are needed by logistics students to be aware of inland waterways transportation as a mode of transport, later in their career. The previously presented models of Campion and Yeh influence this step, in which the interviews are used to find out what the mission and vision of the inland navigation industry is. The mission and vision, in this case, do not refer to a company but the inland shipping industry. Further, based on the information the targeted situation will be developed, and a comparison with the actual situation will be possible to identify the competencies gap.

After the missing competencies are identified, the second step of the model is to define learning outcomes. As part of the learning process, it is essential to see if the user of the program makes progress and is acquiring new skills, abilities, and knowledge. However, competencies are intangible and difficult to assess (Štulina et al., 2017).

Learning outcomes are tangible and assessable statements that will define what the user will be able to do after studying the material on the online portal (Štulina et al., 2017).

Different taxonomies exist that help to define the learning outcomes. One of the most popular ones is Blooms Taxonomy that was first introduced in 1956 and differentiates between cognitive levels that are hierarchically ordered (Davis, 2014). The model "contains six categories of cognitive skills ranging from lower-order skills that require less cognitive processing to higher-order skills that require deeper learning and a greater degree of cognitive processing” (Adams, 2015). Based on Bloom’s Taxonomy, numerous sources offer lists of verbs that can be used per level to tailor the formulation of learning outcomes to the level of complexity. According to Adams (2015), Blooms Taxonomy is a classical work that “had significant and lasting influence on the teaching and learning process at all levels of education.
to the present day” (Adams, 2015). Therefore, the taxonomy will be used to define learning outcomes in the process of this project.

**Figure 4 Blooms Taxonomy**


Finally, suitable learning material will be investigated via secondary research and the expert interviews. Based on the literature discussed the author developed the following visualisation of the theoretical framework, that will be the guideline for the research.
Figure 5 Theoretical framework
3. Methodology

The following section covers the methodology of this research. To structure this part of the report, the “Research Onion” by Saunders, Lewis and Thornhill from 2016 is used. The research onion consists of six layers (Saunders, Lewis, & Thornhill, 2016). Each layer will be discussed, and the choices made for the research justified.

3.1 Research Question

Based on the previous literature review, the following main research question and the three sub-research questions derived that the project is aiming to answer.

Main Research Question:

What type of learning material should be developed for the e-learning portal of bremenports to support the increased usage of inland waterways in Europe based on identified relevant competencies for logistic students from the North-West of Germany?

1. Sub-research question:

Which competencies are currently being taught to logistics students in North-West Germany in the course of their studies on the subject of inland navigation?

2. Sub-research question:

Which competencies do logistics students have to learn to consider inland navigation as a mode of transport in their choice of logistic chains?

3. Sub-research question:

In which form should learning material be delivered on the internet platform of bremenports so that logistics students can acquire missing competencies?
3.2 Research Philosophy

First, the researcher should decide about the research philosophy, which will guide the research. The philosophy is of importance since it reflects the researcher’s beliefs and assumptions that will influence the data collection and analyses. Saunders identified five different types in the research onion, positivism, critical realism, interpretivism, postmodernism, and pragmatism (Saunders, Lewis, & Thornhill, 2016).

The researcher has decided to use the philosophy of interpretivism for this project. It is based on the assumptions of epistemology, meaning that assumptions are being made about the different types of knowledge. Interpretivism emphasis the difference between humans and physical phenomena. In contrast to physical phenomena are humans creating meaning. In interpretivism, it is therefore of importance to look at the topic from different perspectives (Saunders, Lewis, & Thornhill, 2016). As part of the research, primary data was collected via semi-structured interviews. The data collection was, therefore, influenced by the assumptions of the researcher during the analyses. Besides, personal interpretations of the interviewees about the topic contribute to the fact that interpretivism is subjective.

3.3 Research Approach

The research onion provides three research approaches, deductive, inductive, and abductive (Saunders, Lewis, & Thornhill, 2016). Based on the previous decision to follow the philosophy of interpretivism, the decision was made to use an inductive research approach. This approach implies that the theory follows the data that was collected. This enabled the researcher to identify a possible gap between the competencies logistic students acquire in their studies and which the industry of inland waterway transportation would like them to gain. Further, the implementation of the e-learning portal was investigated. Therefore, it was essential that the researcher gained an understanding of how different parties interpret the situation.

3.4 Methodological Choice

The third step is the choice of research. This part introduces qualitative and quantitative, mono, mixed, and multi-methods to select the sources for the data collection (Saunders, Lewis, & Thornhill, 2016). As earlier mentioned, the choice had been made to use qualitative data in the form of expert interviews. To be more precise, the qualitative mono-method, semi-structured interviews were used. The decision was taken because in-depth knowledge, and experience of interviewees was needed for the research project.
The qualitative data collection is in line with the interpretive philosophy, as the researcher must make sense of the subjective opinions of the respondents and understand the underlying context of their answers.

Further, the purpose of this research is exploratory. According to Saunders exist five different purposes for research, exploratory, descriptive, explanatory, evaluative, and combined studies (Saunders, Lewis, & Thornhill, 2016). This research is exploratory because the project aimed to gain an insight into education and inland waterway transportation by asking open questions and talking to experts.

3.5 Research Strategy
The fourth layer of the research onion is concerned with the strategy the researcher chose to answer the research question. Saunders mentions eight different strategies, six of them are associated with qualitative research, archival research, case study, ethnography, action research, grounded theory, and narrative inquiry (Saunders, Lewis, & Thornhill, 2016).

The case study had been chosen as the research strategy since the project is applied research that aimed to provide feasible recommendations. Therefore, the research aimed for an insight into the case of logistics education regarding inland waterway transportation in its real-life context.

3.6 Time Horizon
Given the time constraints of the graduation project and the fact that the project is part of a broader scope, the Interreg North Sea Region project, this study will be cross-sectional. A possible change in the students' knowledge generated by the competence and the e-learning portal cannot be measured within the time frame and scope of this research. Therefore, this project is not a longitudinal study.

3.7 Techniques and procedures
The core of the research onion deals with the selection of the sample size and technique, the primary and secondary data collection, and the way the data will be analysed (Saunders, Lewis, & Thornhill, 2016).

3.7.1 Sample Size and Technique
First, the researcher decided about suitable sample size and technique for the semi-structured interviews. It was essential to select an appropriate number of interviewees to achieve reliable results.
Since it is impossible for this project to address the research question and objective by drawing statistical conclusions about the characteristics of the population, the non-probability sample technique was chosen.

For this technique, no rules exist how large the sample group should be. In this case, it depends on the selection technique, the purpose and the focus of the research. Nevertheless, did Saunders provided limited guidelines for the different types of studies. Regarding a research project like this and the use of semi-structured interviews, he recommends between 5-25 people (Saunders, Lewis, & Thornhill, 2016). However, the researcher had to consider limitations as for time and money for the selection of the sample size. At the beginning of the research process, the author was provided with a list of possible interview partners by the company supervisor, the list can be found in the appendix A.

As the non-probability sampling technique, the purposive sampling was chosen. This technique was used because the researcher aimed to get vital information by selecting knowledgeable individuals. As shown in the table on page 21, the interview partners were categorised into different groups based on their employment. Thus, the experts were divided into homogeneous groups. This subdivision makes it possible to explore the topic in greater depth and built an advantage for this research.

3.7.2 Secondary Data Collection

The collection of secondary data adds great value to the research by providing additional information and might even provide different interpretations (Saunders, Lewis, & Thornhill, 2016). For this project, two types of secondary data were used. First, "document secondary data" the physical form of the originally collated data. Secondly, "Multiple-source secondary data", which is a mixture of the document data and data collected via surveys.

For this research, the author used data published by the EU commission of transport, textbooks, and different online data banks from the Hanze media library to gain access to academic books and journals, about training and development, e-learning, and competencies. Besides, the curricula of the logistic studies from North-West Germany were used to find out if content about inland waterway transportation is being taught. However, the number of curricula at universities in North-West Germany does not provide a reliable basis for an analysis of the initial situation. It was not possible for the author to have access to all documents since some were not public. Furthermore, logistic contents are not only addressed in specialised logistic study courses but also in modules in business administration study courses, and the structure and content of the module manuals vary strongly between the different universities. Due to a large number of study courses in which logistics appears and the different names of the study courses, it is therefore not possible to derive a reliable result from the curriculum. The scope of the logistics courses was limited to the North-West of Germany (a map
on which the North-Western part of Germany is marked is in the appendix D) and all curricula were selected which the researcher had access to. The assumption that inland navigation is no longer taught at universities in the field of logistics was, therefore, additionally supported by expert interviews.

Further, suitable data was selected on two main requirements; the reliability of the sources and the validity. Reliability, validity, and ethical considerations are being discussed in an extra chapter.

3.7.4 Analysing Qualitative Data

Finally, the collected primary data was analysed. As a first step, the recorded interviews were transcribed and, translated from German into English. Thereby, it was essential to note additional information that the researcher noticed during the interview. To assist the author, a researcher notebook was used to document additional observations and ideas.

As a second step, ATLAS.ti was used as a tool to analyse the transcribed interviews by coding the transcripts. Thereby, the data was being labelled with a code that summarised the meaning of the data (Saunders, Lewis, & Thornhill, 2016). Moreover, the grounded theory was chosen as a guideline for a holistic approach to the research project.

The coding process started by open coding, which is the first step of labelling the data of the transcripts and dividing the information into conceptual units. The labelling and selection of codes derived from the SQRs.

Following axial coding was used, in this step, the different categories, selected in the first stage, were investigated for relationships between them. The codes were divided into different code groups to gain a better overview. The final step was selective coding by identifying core categories, which were the basis of the grounded theory (Saunders, Lewis, & Thornhill, 2016). The method was chosen to develop an explanatory theory that is grounded in the meanings stated of the interview partners and the secondary research conducted. Based on the code groups networks were developed that summarised the data of the interviews concerning the SRQs and were essential support in analysing the data, they can be found as a digital version on the USB stick. The network referring to the first research question was complemented by the contents of the curriculum for a better overview for the author.
3.8 Reliability and Validity

Saunders defines reliability as, "the extent to which data collection technique will get consistent findings [...] or conclusions reached by other researchers [...]" (Saunders, Lewis, & Thornhill, 2016). The reliability of the data collected for this research was ensured by using reliable and academic sources of the Hanze database. Besides, documents were used that were published by governmental agencies and in academic journals. Furthermore, the author used mostly sources that are current, not older than five years, and that were peer-reviewed.

Besides, to ensure a degree of reliability, the interview partners were informed about the content of the interview before ahead. Semi-structured interviews are not standardisable, because, in interviews, the questions can be posed in a different order, additional questions can be asked or omitted. Therefore, it is questionable whether another researcher could achieve the same results and thus reduces reliability. Also, the results could be influenced by researcher bias or interviewee bias. With researcher bias, it can be that the interviewer influences the interviewee by the tone and nonverbal behaviour but also especially by how the interviewer interprets the results in the work. Interviewee bias can occur when the interviewee only gives parts of the information to present himself positively or negatively for a variety of reasons (Saunders, Lewis, & Thornhill, 2016). This has been tried to avoid by a neutral attitude of the interviewer and neutral locations for the interviews.

According to Saunders, validity is the "extent to which data collection methods measure what they are intended to measure" (Saunders, Lewis, & Thornhill, 2016). To ensure validity for secondary research, a strong focus was on finding the right sources that fit the topic and do not provide false information. To ensure a high degree of validity during the primary research clarification questions were asked, if needed, during the interviews to avoid that the researcher misunderstood the answers. However, the researcher should have included more clarifications and probing questions to increase validity. Due to the unfamiliar situation and the position of the respondents, the researcher nevertheless did not dare to ask several additional questions. Before the start of the interviews, the questions were tested in a pilot interview with a person that was not involved as an expert to ensure that the questions can be understood easily. Additionally, all participants were offered to receive the transcripts for a member check. Unfortunately, did two participants decline the offer right in the beginning. This might influence the validity because it cannot be ensured that the author understood the answers correctly. Further, the researcher bias might influence the validity of the results.

Due to the possible misinterpretation of answers without a member check of the interviews and the fact that the interview results are not comparable due to the use of semi-structured interviews, both reliability and validity decreased.
3.7.3 Primary Data Collection

Additionally, to the collection of information via secondary research, primary research was conducted. The researcher aimed to be able to conduct between nine and ten interviews based on the list of potential interview partners, appendix A. This seemed to be a realistic number in connection with the fact that the company supervisor knew the potential interview partners. Semi-structured interviews were chosen to collect in-depth knowledge while following a specific structure. Additionally, permission was asked to record the interviews. In the following, a table with the name and the position of the interview partners is included. More detailed information about the interview can be found in the tables above the respective interview transcript in appendix H.

By conducting semi-structured interviews, the researcher developed questions before the interview, while leaving the option to ask additional questions or react towards the information form the interview partner. The final list of experts for the interviews differs from the preliminary list of possible interview partners. Not all interviewees contacted by Dr Stemmler, the company supervisor, in advance, felt able to answer the researcher’s questions. Due to the so-called snowball effect, however, further interview partners could be won for the interviews. Therefore, nine expert interviews could be conducted.

Further, the researcher aimed to conduct most interviews face-to-face, it was hoped that a conversation begins more quickly, and the flow of speech is stimulated. Face-to-face interviews were possible with five out of nine interviews because the interview partners were located in Bremen or within a radius that the author could drive to. The additional four interviews were conducted via phone. The duration of the interviews varied considerably and ranged from 90 to 25 minutes. On average, the interviews lasted 47 minutes. Leading questions of the interview were open questions. In the following is a list provided which illustrates the connection between the leading questions of the interviews and the SRQs.
### Table 1 Interview questions in connection with the sub-research questions

<table>
<thead>
<tr>
<th>Sub-Research Question</th>
<th>Semi-Structured Interview Educational Experts</th>
<th>Semi-Structured Interview Industry Experts</th>
</tr>
</thead>
</table>
| **SRQ1:** Which competencies are currently being taught to logistics students in north-west Germany in the course of their studies on the subject of inland navigation? | 1. How far do you integrate inland navigation as a topic into the study content?  
2. (If IW is integrated) In which courses is inland navigation taught?  
3. Do you believe any additional content should be covered?  
4. What do you believe, why is inland navigation partly or no longer taught as part of the logistics course? | 1. Do you know the contents that are covered by the universities within the framework of logistics courses?  
2. In your opinion, should additional content be covered? |
| **SRQ2:** Which competencies do logistics students have to learn to consider inland navigation as a mode of transport in their choice of logistic chains? | 5. Which competencies do you think are needed to actively involve inland navigation as a mode of transport?  
6. Often, profession-specific competencies are linked to the mission, vision and goals of a company. What would you call the goals or mission of the inland navigation industry?  
7. What are your personal expectations of future decision-makers in the logistics sector? | 3. Which competencies do you think are needed to actively involve inland navigation as a mode of transport?  
4. Often, profession-specific competencies are linked to the mission, vision and goals of a company. What would you call the goals or mission of the inland navigation industry?  
5. What are your personal expectations for future decision-makers in the logistics sector? |
| **SRQ3:** In which form should learning material be delivered on the internet platform of Bremerports so that logistics students can acquire missing competences? | 8. As a lecturer, what do you think are the most effective learning materials for teaching competences? | Not applicable |
| **Additional Question** | 9. What opportunities do you see in inland navigation?  
10. Please add any information you would like to share with me that I have not asked for. | 6. What opportunities do you see in inland navigation?  
7. What do you think are the reasons that inland navigation is not fully exploited, despite its advantages?  
8. Please add any information you would like to share with me that I have not asked for. |
question was intended to give the interviewee time to get used to the interview situation and allowed the researcher to understand the holistic picture of the current situation in inland navigation and to develop a better understanding.

Reliability, validity and ethical consideration are dealt with in extra chapters to avoid repetitions and to provide an overall overview.

3.7.3.1 Interview Partners
In the following table, all interview partners are listed. The experts are sorted according to the fields of their expertise. The order of experts does not reflect any preferences. A careful first selection of interview partners was made in cooperation with bremenports. Additionally, all contacts are related to Dr Stemmler. This increased the chance of receiving positive assurances for interviews and reliable information.

It was aimed for a balance between lectures from universities and industry experts to gain an understanding of the expectations and circumstances from both sides. However, it should be positively mentioned that some interviewees had experiences from the industrial side as well as from the university and, therefore, had a very deep understanding of both sides. A detailed justification for the selection of experts can be found in appendix B.
### Table 2 List of interviewees

<table>
<thead>
<tr>
<th>Institution</th>
<th>Name</th>
<th>Occupation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Higher Education Logistic</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. University of applied sciences Osnabrück</td>
<td>Prof. Dr. Bruns-Vietor</td>
<td>Professor of Business Administration, in particular Logistics Management</td>
</tr>
<tr>
<td>2. Deutsche Außenhandels- und Verkehrsakademie (DAV)</td>
<td>Mr. Zink</td>
<td>Head of Studies at the DAV</td>
</tr>
<tr>
<td>3. German Foreign Trade and Transport Academy</td>
<td>Mr. Peterson</td>
<td>DAV Lecturer Traffic and foreign trade</td>
</tr>
<tr>
<td>4. Maritime Académie of Harling</td>
<td>Mr. Boll</td>
<td>Head of the project department</td>
</tr>
<tr>
<td><strong>Industry Experts</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Shortsea Shipping Promotion Centre Germany</td>
<td>Mr. Nölke</td>
<td>CEO</td>
</tr>
<tr>
<td>6. Previous CEO of via Bremen</td>
<td>Mr. Will</td>
<td>Pensioner</td>
</tr>
<tr>
<td>7. Senator for Economics Labor and Ports. Responsible for inland shipping</td>
<td>Ms. Vasterling-Will</td>
<td>Employee at the Senator for Economics Labor and Ports. Responsible for inland shipping</td>
</tr>
<tr>
<td>8. RheinCargo GmbH &amp; Co. KG</td>
<td>Mr. Eckel</td>
<td>RheinCargo - CEO</td>
</tr>
<tr>
<td>9.</td>
<td>Mr. Klippel</td>
<td>Head of Marketing and Sales at RheinCargo</td>
</tr>
<tr>
<td>10. DST – Development Centre for Ship Technology and Transport Systems</td>
<td>Mr. Alias</td>
<td>Department Head at the DST</td>
</tr>
<tr>
<td>11. Shipping Company Dettmer</td>
<td>Mr. Poser</td>
<td>Branch manager tankers</td>
</tr>
</tbody>
</table>

### 3.9 Ethical Consideration

The ethical consideration of the research plays an important part and ensures good practise and avoids potential harm for the people involved in the research. For secondary research, ethical issues were taken into consideration. If the author used secondary information, she was obliged to reference the source according to the APA style. Further, an interest of conflicts needed to be avoided by staying in the position of a neutral consultant for bremenports and not to influence results to please a particular party.

Especially regarding primary data collection, ethical issues were considered. Prior to the interviews, the participants were informed about the topic and the goals to ensure that they are aware of what they are participating in. Further, the researcher first needed full consent of the interview partners before conducting and recording the interview. Additionally, it had to be clear that participation in the interview was voluntary, and it had to be accepted if a participant wanted to withdraw or not answer questions. Before the beginning of the interview, it was therefore always asked whether the interview may be recorded. The privacy of the participants had to be respected and their dignity. Besides, any
harm to the participants needed to be avoided, physically and mentally. Respectful interaction was a prerequisite and to not put the participant under pressure. Finally, the data and information contained in the interviews must be accurately and truthfully presented.

3.10 Limitations

For the limitations of the project, it is essential to consider the time constraint of eight weeks, and scope constraint of 15,000 words for this project. Further, it should be considered that the knowledge of the researcher of the topic inland navigation is limited and that this might have an influence on the development of the competencies and learning outcomes. Additionally, it is vital to be aware that it was not possible to include all existing secondary sources in this work. Besides, the author did not have access to all files. Thus, the availability of resources was limited to this work. A further limitation of the report is that this research is based on a snapshot and that the circumstances that could influence the results of the work are in constant development. In addition, qualitative data collection is very subjective and can be interpreted differently. Mixed methods were initially considered by issuing surveys to students as they are the final target group of the project. However, it was realised that students will not be able to answer questions about a topic they do not know about yet. The research aims to provide the students with missing knowledge. Quantitative data collection was, therefore excluded. To gain a more in-depth insight into the topic, the researcher considered the possibility of a focus group. By interviewing several experts at the same moment, a discussion could be stimulated. However, most experts on the list with possible interviewees came from different cities which would have made it more challenging to get several experts on the same appointment, at the same place.
4. Findings and Discussion

In the following, the findings of the research as well as the discussion is analysed. Therefore, the extent to which inland navigation and which competencies are currently included at universities in the Northwest of Germany will be examined. Furthermore, it will be investigated, which competencies should be taught according to the industry to derive the competence gap from both factors. Finally, based on the identified competency gaps, it is examined what a learning inventory might comprise of to impart the missing competencies voluntarily. The findings are analysed based on supporting secondary research.

4.1 Current teaching content in relation to inland navigation

In the following, it will be investigated which contents and competencies are currently being taught at German universities and universities of applied sciences. Both educational institutions were chosen because students with the respective degrees can occupy the same position as logisticians.

In the Northwest of Germany, four logistics programmes are offered, a list of programmes and locations can be found in appendix C. The programs do not run under a uniform name, and one should consider that logistics is also often offered either as a basic module or as specialisations as part of the business studies programme. The composition of different focal points in the field of logistics can then even reach the level of a full-fledged logistics study (Bruns-Vietor, 2019, ln 57-58).

To find out what content is being taught, the curricular of the study programs were investigated. Expert interviews gave an insight into the programs and reasoning for the current situation. If one has a look at the curricula of the logistics study program and searches especially for the term "inland navigation" different aspects appear. In Bremerhaven inland navigation is taught as an elective module as a mode of transport for dangerous goods, in the field of traffic law and transport technology. Students gain the competencies of understanding the advantages and disadvantages of different transshipment methods, and the ability to assess the applicability of those (Hochschule Bremerhaven, 2018). At the study program international logistics management at the University in Elsfleth, IWT is part of transport management (Jade Hochschule, n.d.). Unfortunately, no further information is given regarding the competencies students acquire as part of the course. Besides, students at the Technical University Ostwestfalen-Lippe can follow the international logistics study program. IWT is included in the course transport and logistics service management as part of the individual modes of transports module. The learning goal and the competencies students gain during the course is to know the structure and processes of transport and logistics service providers, to master management skills and tools for design
and optimisation of transport processes, and to be able to solve elementary transport tasks under technical, organisational, economic and ecological aspects (Technische Hochschule Ostwestfalen-Lippe, 2019). However, at the study program logistics and production at the Gottfried Wilhelm Leibniz University of Hannover, IWT is not a part of the module manual and modes of transport are not mentioned either (Leibniz Universität Hannover, 2017). Therefore, no competencies could be found for inland navigation.

Further, at the German Foreign Trade and Transport Academy, hereafter DAV, in Bremen students can follow the bachelor study program international logistics management or can become a business administrator of freight transport and logistics. For both programs, the prerequisite is a completed apprenticeship. Therefore, inland waterway and the modes of transport are not taught in particular during the study program. It is assumed that the students gained knowledge about inland waterway transportation and the other modes of transport during their apprenticeship (Zink, 2019, ln 48-59). However, Mr Zink (2019, ln 50-51) noted that this is no longer always the case and that the transport possibilities are no longer included in the training. Therefore, it could be imagined to rethink the current system and teach in the bachelor programs inland navigation. However, for the business administration of freight transport and logistics training, IWT is part of the study program and is taught by an expert of the industry. Twice a year an industry representative is teaching eight to ten hours only about the mode of transport for the students to be aware of inland navigation (Zink, 2019, ln 34-37). Nevertheless, this is not part of the bachelor program to this point.

Due to the more detailed examination of the curricula of the logistics degree programs, it is noticeable that inland navigation does not appear in the curricula or only to a minimal extent. Besides, the contents are difficult to compare because the degree programmes have different names, and the topic is taken up differently.

As mentioned before, one should also consider the business administration study programs, since logistics is often part of the program either as a basic module or as a specialisation. Comparing the curricula of the university in Bremen, Hanover, Emden/Leer, and Osnabrück, inland navigation is not explicitly mentioned. Nor does the term “mode of transport” appear, which could include inland navigation. Mr Zink (2019, ln 76-77) from the DAV supports the assumption that IWT is no longer being taught and adds that he believes that no mode of transport is taught at universities or only to a certain extent. A possible reason might be that it is assumed that the modes of transports are the tools of traits of the logistician, and that students are naturally aware of this (Zink, 2019, ln 77). Also, Mr Klippel (2019, ln 130-131) mentions that he studied logistic management a few years ago and that inland navigation was not taught. Mr Alias (2019, ln 339-342) stressed that inland navigation is no longer
taught in universities since he had to deal with some universities through his career and noticed that inland navigation was not part of the curriculum at the universities.

Possible reasons for the underrepresents of inland navigation might be the “bad image” of IWT and logistics in general, and the professional background of the lecturer. Many people associate inland navigation with a dusty image, Mr Will (2019, In 145) says, a lot has already happened in the industry and the modern ships are really impressive. The mode of transport is not exciting enough, Mr Zink (2019, In 256-259) emphasised. This could be related to the fact that inland navigation stands for more traditional values, says Mr Alias (2019, In 180-181), such as stability, reliability, a little for decent values, the question would be what the core image problem is and what image inland navigation would have to represent in order to become exciting. Ms Vasterling-Will (2019, In 61-62) emphasises that the problem could also be that the inland waterway vessel is too inconspicuous, does its job conscientiously and quietly in the background and thus receives no attention. This lack of attention now seems to be reflected in the curricula.

Ms Bruns-Vietor is a lecturer for business administration and especially logistics. Her personal experience is that the professional experience of the lecturers plays an important role and that it is highly dependent from the lecturer if a student learns about inland navigation or not (Bruns-Vietor, 2019, In 89-91). Ms Bruns-Vietor has a professional background in transports logistics and includes inland navigation in her logistics lesson as part of the business administration study program. As part of the fundamental logistics course she presents all modes of transport, the division of the modal split, she discusses the competition between the modes of transports and the historical development of the traffic volume on the different modes of transport (Bruns-Vietor, 2019, In 189-198). However, she does know that her colleagues do not include IWT or only to a certain extent because they have a professional background in intralogistics, which has less to do with transport (Bruns-Vietor, 2019, In 69-74). Apparently, it is not only the students who do not know about inland navigation, but it is also a "blind spot", as Ms Bruns-Vietor (2019, In 148) refers to it in the mind of the lecturers. To tackle the unawareness about inland navigation it is of great importance in her opinion to overcome the blind spot. Mr Boll (2019, In 142) of the maritime academy in Harling, who is a project partner of the #IWTS 2.0 program, identifies unawareness as to the crucial problem for the lack of training in inland navigation, too. Furthermore, Mr Nölke (2019, In 95-99) mentioned that his organisation tried to analyse the curricular of study programmes as well and concluded that the topic of inland waterway navigation is not examination relevant. This, of course, is a further factor influencing the content being taught at universities. However, this could lead to another problem, that students get the feeling that the carrier has no importance, because it is not mentioned or has no examination relevance, argues
Mr Nölke (2019, In 120-122). It leads to the fact that the blind spot mentioned before also develops with the future decision makers.

Mr Eckel (2019, In 158-160), would see it as a high added value if the transport modes were addressed more strongly during the studies and Mr Alias (2019, In 336-337) also notes that a logistician could work much more efficiently if intermodal transport were discussed during the studies. Intermodal transport is a multi-link transport chain (English Oxford Living Dictionary, 2019). Mr Poser made the problem particularly clear during the interview. He has experience with the content taught at a few universities and says that although some modes of transport are still present, inland shipping is forgotten. The long-lasting problem is that the students later work in the logistic- and logistic purchasing department and tender or select offers and are not aware of the possibility of inland navigation, which leads to automatic exclusion (Poser, 2019, In. 80-84).

Although the industry would appreciate it if all carriers, including inland navigation, were taught again, it is only partly or not at all taught at universities for several reasons as the wrong image of logistics, the lack of knowledge of lecturers, and the assumption that students already possess the knowledge. The interviews and curricula thus confirm the problem statement of the research that IWT is not taught at universities in the North-West of Germany.
4.2 Expectations of the industry

After the current situation at universities had been discussed, it is of importance to investigate the expectations of the industry towards future decision makers in logistics and what competencies they should have to identify a possible competency gap.

As part of the interviews the experts were asked for competencies the students should develop, for their expectations towards the logistics students as a future decision maker, and the mission/goals the industry of IWT is aiming for. The expectations and the mission and goals can have further influence and indicate possible competencies. Both authors Campion et al. (2011) and Yeh et al. (2006), included the identification of mission, vision, and strategy of a company into their research. This is based on the intention that the competencies are aligned with the strategy and thus offer a strategic advantage in the implementation of the goal or mission (Campion, et al., 2011).

First, the competencies are evaluated that were directly asked for. Ms Bruns-Vietor (2019, In 5-6) states that it must first be anchored in the student’s memory that inland navigation is an equivalent mode of transport. Mr Poser (2019, In 95) said that it is an essential requirement that one knows that inland shipping exists. This addresses the previously mentioned problem of the "blind spot". As a lecturer Mr Peterson does agree with this opinion. A basic understanding of the modes of transport would be the basis for being able to create a transport concept, which is one of the main tasks of a logistician. Without this basic understanding, the logistician would not be able to meet the requirements of its customers (Peterson, 2019, In 144-147). Therefore, it is important that the logistician is aware of the possibilities and knows that one can select or exclude modes of transport in a selection procedure mentions Ms Bruns-Vietor (2019, In 161-162). The selection process of a mode of transport is thus an essential first competence that students needs to include inland navigation as a mode of transport in their logistic decisions.

However, to be able to select a mode of transport, one should be aware of its advantages and disadvantage (Vasterling-Will, 2019, In 137). This relates to the opinion that information and characteristics about the individual modes of transport should be provided (Nölke, 2019, In 151). Among these key data is the price, the kind of ships that are available as tankships or ships for dry cargo and how much volume they have (Boll, 2019, In 200-201, In 214-217). According to Mr Poser (2019, In 90-91) the dimensions for an inland waterway ship are a lot bigger and not comparable with the volume of a truck. Further, it would be essential to illustrate where the waterways are so that the logistician can investigate whether the customer is located on suitable waterway (Boll 2019, In 214-217). The availability of waterways and the different types of ships are important, to understand what possibilities IWT offers. In addition, the lead times of transport are important. During the interview Mr Boll drew attention to the planning tool blue road maps (www.blueroadmap.nl) (Boll, 2019, In 221).
This tool would enable the student to calculate a possible route, see the duration and even which possible ships could be used, for example. Without these facts, and without being able to compare these characteristics to other modes of transport, it would not be possible for the logistician to create a transport concept (Peterson, 2019, 132-135). This means that first, it has to be fundamentally conveyed that there are different alternatives that IWT is a part of, knowing the possibilities of IWT and that one can choose between them.

It is essential to have a contact person that one can ask for information (2019, Bruns-Vietor, ln 177-178) (Vasterling-Will, 2019, ln 141-142). This was mentioned as one of the most critical factors to facilitate the handling of inland waterway vessels and to simplify the step into an industry. Specific knowledge about technical things or legal requirements would not be necessary, but a contact person in this case who is the expert would be necessary because the logistician cannot be an expert of every mode of transport mentioned Mr Klippel (2019, ln 244-251).

During the interviews, it became apparent that it is difficult for the participants to define competencies (examples and explanations were given in advance), often it is the case that knowledge was discussed instead of competencies, which, of course, forms part of the competencies. Mr Zink (2019, ln 249-253) adds that it is more about knowledge than about competencies because the basic competencies that a logistician needs, remain the same for every mode of transport. Therefore, one should, possibly distinguish between core and key competencies. While a core competency is fundamentally important for each employee in the organisation to succeed, the key or functional competencies are especially important for specific tasks of a particular job (Sturgess, 2012). For this project, the core competencies represent those that are fundamentally important for the logistician, independent of the mode of transport and the key, in this case, are those that relate specifically to inland navigation. Both key and core competencies play an important role in their function but could rather appear in such a way that the key competencies build on the core competencies.

After the essential content-related points were discussed that enable the logistician to work with the means of transport, the ideas of possible competencies were further clarified. This means that first, the awareness for the mode of transport has to be created, followed by the necessary data and finally the specific competencies in the field of inland navigation.

An often-mentioned disadvantage of the inland ship in contrast to the truck is that most companies are not directly located on the waterside and that it is, therefore, necessary to first transport the cargo to an inland port before the cargo can be loaded on the inland waterway vessel (Peterson, 2019, ln 124-127). These broken transport chains are also reflected in the price mentions Mr Will (2019, ln 100-105). This means that even if the logistician is aware of inland navigation, it can still fail due to the
transhipments. Mr Alias says that it is important to have concepts that prevent the transshipment from becoming a barrier. He says that this would be a competence to develop less infrastructure-intensive transshipment possibilities and to show that transport cost calculation and transport cost planning does not always have to follow the classical models (Alias, 2019, In 203-207).

A further issue that the IWT industry deals with is the fact that the inland vessel is slower compared to other modes of transports and is less flexible due to the “fixed” waterways (Eckel, 2019, In 18-19, In 35). However, this does not have to be a disadvantage necessarily, the inland waterway vessel is the most reliable mode of transport and offers good planning security (Alias, 2019, In 270, In 102-105). A planning security that the truck, for example, is not able to offer due to unexpected traffic jams. This planning certainty could be used as a great advantage if students were taught the competence to plan holistic transport concepts (Nölke, 2019, In 289-291) at an early stage. Thinking holistically was also mentioned as an expectation (Nölke, 2019, In 252).

This means that today a great deal of importance is attached to the fact that the big picture is considered, and one does not look for short-term solutions that almost only the truck can offer because it is so flexible. Mr Alias (2019, In 161-162) and Ms Bruns-Vietor (2019, In 36-39) consider this great urge for flexibility to be a psychological factor that has nothing to do with rational action. This assumption supports the theory of bounded rationality. This theory implies, “the idea that decision making deviates from rationality due to such inherently human factors as limitations in cognitive capacity and willpower, and situational constraints” (Lerner, Li, Valdesolo, & Kassam, 2015). Due to careful planning in advance, the flexibility factor would not be needed for 80% of the transports, according to Mr Alias (2019, In 158).

As part of the holistic planning of transport concepts, a further necessary competence arose from the interview, the multimodal transport. Mr Nölke (2019, In 106) stressed that the idea of multimodal transport should be emphasised much more strongly in the universities, i.e. the combination of different modes of transport. This offers the possibility to balance the individual strengths and weaknesses (Peterson, 2019, In 193-198). The student would be able to choose for which part of a route it makes sense to use which mode of transport highlight Mr Peterson (2019, In 176-177). This competence once again shows how vital basic understanding is for the individual modes of transport. Already here the importance of Blooms Taxonomy becomes important. It becomes clear that a foundation of knowledge has to be created before students will be able to develop competencies like a transport concept. Bloom developed different levels in the learning process that build on each other to develop learning goals (Davis, 2014).
Furthermore, sustainability and environmentally friendly transport solutions are an essential topic with a wide range of opinions. Whereas Mr Alias (2019, In 48-52) mentions the environmental friendliness of the inland waterway vessel as an advantage, he stresses that this has no primary significance for the decision making of most logisticians because the focus is the price for the logistician and the customer. However, this is since the margin in the industry is very low, and the higher costs of any environmentally friendly transports immediately threaten the existence of a company (Alias, 2019, In 60-66). Whereas Mr Will highlights the importance of the factor environmental friendliness and says that it is a decisive factor how things will continue in the industry in the coming years, because in his opinion logistics and green must go together (Will, 2019, 535-536). Mr Eckel (2019, 72.79) also confirms that environmental friendliness does not represent a short-lived monetary value. If, however, the external costs were considered, then one would recognise a clear advantage. Ms Bruns-Vietor (2019, In 278-282) takes it one step further and says the question should be asked if transports can even be prevented or consolidated. She draws considerable importance to the environmental factor (Bruns-Vietor, 2019, In. 278-279). The view of Alan McKinnon, who has published an article on the importance of sustainability in logistics, can also play an interesting role in this context. According to his expertise, sustainable transport solutions offer cost advantages instead of disadvantages. He confirms that the sustainability factor is simply becoming increasingly important in the industry (McKinnon, 2017). This means that the sustainability factor should be anchored in the student’s memory even if the industry is still developing in this area. In addition, it should not be forgotten that sustainability is also becoming an increasingly important issue for young people according to the Federal Environment Agency, which conducted a study in Germany in 2016 (Umwelt Bundesamt, 2016). The environmental awareness of younger people can also benefit inland navigation as an environmentally friendly mode of transport.

Finally, the subject of innovation also plays a significant role, as does the subject of digitalisation. Already today, many logistics companies talk and brand themselves as being innovative without trying out new transport concepts, and solutions criticises Mr Nölke (2019, In 329-333). According to Mr Alias (2019, In 194-196), it is precisely these innovative solutions that offer great advantages, which could also increase the capacity utilisation of inland navigation. For example, by capturing data throughout the supply chain, which might allow better planning and more accurate operations (Alias, 2019, In 194-197). By developing new innovative concepts for inland navigation and logistics in general, it would not only be possible to achieve better capacity utilisation but also to appeal to young people and get them enthusiastic about the topic (Stemmler, 2019, In 356-358, In 393-395). Mr Alias remarks: "Data, information, transparency, the organisation of information chains will play an essential role" (Alias, 2019, In 306-307).
Digitalisation and innovation play an important role, which is also reflected in Minister Scheuer's master plan for inland navigation in Germany, published on 14 May 2019, which is to be implemented by 2030. The topic of digitisation is given an entire chapter in the paper, which is to deal with the digital challenge to increase competitiveness. But also, the area of innovation finds much significance in the report, especially in connection with the topic of environmental friendliness (Bundesministerium für Verkehr und digitale Infrastruktur, 2019). The statements of the experts and the publication of the master plan for inland navigation make clear the importance of innovation and digitisation also as a topic for the new generation of logisticians.

Furthermore, Seebacher (2017) confirms the enormous importance of digitisation competencies in logistics companies. He emphasises that “experts agree that the digital competence of a company will be an indispensable success factor for a logistics provider in the future” (Seebacher, 2017). The managers in charge of logistics are challenged to question the current strategies and deal intensively with the topic (Seebacher, 2017). Thus, the teaching of digital competencies in the young age could be of enormous value.

As mentioned in the beginning, it is of importance to investigate the expectations of the industry towards the logistics students to identify further possible competencies. The factor of environmentally friendly transport solutions was an important topic with very different viewpoints. Nevertheless, the industry expects students to be aware of their actions, including their impact on the environment (Vasterling-Will, 2019, 175-176) (Bruns-Vietor, 2019, In 278-279). Further, it was clearly emphasised that students need to think outside the box, think of new alternatives, and to combine old concepts with new ideas that fit the changing circumstances, as increasing road traffic, and environmental factors (Klippel, 2019, In 277-279) (Peterson, 2019, In 478). Since changes in the logistics industry seem to be difficult, it is particularly important for future decision-makers to have willpower and persistence to gain a changing mind set and to influence others because they are expected to discover new ways, be flexible and enthusiastic about what they are doing (Zink, 2019, In 444) (Vasterling-Will, 2019, In 177) (Klippel, 2019, In 276). Nevertheless, they are expected to critical question, getting out of their comfort zone while being able to acknowledge the opinion of experts and practice holistic thinking (Zink, 2019, In 446, In 480) (Peterson, 2019, In 468) (Nölke, 2019, In 252). The expectations of the experts toward students are high but are reflecting the changing circumstances in the industry.

As for the mission and goals of the industry, the number one priority is to make the industry better known and to be present in the minds of the logistics companies, thus leading back to the goal and purpose of this work (Will, 2019, In 474). However, the big goal remains the decarbonisation of the economy, and to shift more goods to the waterways and to drive short distances by truck only (Nölke, 2019, In 201). Ultimately, cooperation between the modes of transport is being pursued (Nölke, 2019,
In 242) (Peterson, 2019, In 176). To achieve the goals of becoming better known, to combine transports and to act more sustainably, the competencies identified below must be imparted.

Under these circumstances, a clear gap of competencies can be identified. The content of the different universities is not uniform, and IWT is only taught by two of the identified universities. Further, the interviews with experts from industry and education also confirm that it is hardly taught, if at all, or only mentioned once. The competencies of the curriculum to which the author had access were formulated in a general way and not specifically for IWT. A precise comparison of the competencies can therefore not be made, but it became clear that the industry and education would see an added value in it when it is taught. In the following one deals with the competencies which should be obtained according to the investigation by logistics students.
4.3 Competencies

Given these points, eight different competencies can be defined based on the research that students as future decision makers in the logistics industry should acquire as competencies. In the following the competencies are defined in more detail as the collection of knowledge, skills, abilities, and other characteristics as prior defined in the literature review. The competencies are formulated in sentences for a better understanding and a more orderly overview. Besides, Dr Neumann stresses that competencies are described as a totality greater than the individual parts (Neumann, 2015). On the left side of the table is marked which dimension the competence belongs to.

Table 3 List of competencies

<table>
<thead>
<tr>
<th>Technical competencies refer to the knowledge, skills and abilities that are required for the goal-oriented and appropriate fulfillment of a specific task (Neumann, 2015).</th>
<th>Competencies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Selecting a mode of transport</strong></td>
<td>One is aware that a selection decision can be made. One knows between which modes one can choose and which character traits these have. One is aware of one’s own scope of decision and can recognize which possibilities there are and how these are used and decides on the basis of this.</td>
</tr>
<tr>
<td><strong>2. Developing multimodal transport solutions</strong></td>
<td>All modes of transport and their characteristics are known (e.g. Shift work or prohibition to work on public holidays). One is able to combine the modes of transport and to decide which combination is most suitable and has the necessary knowledge to organize them and to communicate with other carriers. The optimal supply chain alternative is created through strategic planning and the combination of transport modes.</td>
</tr>
<tr>
<td><strong>3. Planning a holistic transport concept</strong></td>
<td>One knows all possible means of transport and their characteristics as well as the effect of different combinations of means of transport on the processes and which interactions result from it. One is able to organize the transport, plan the route and calculate the time and costs. Further, one has developed time- and organization management, communication skills, including subsequent variance analysis. One reflects how this has an ecological impact.</td>
</tr>
<tr>
<td>Methodical competences refer to the ability to use cognitive abilities flexible and across situations to be able to master complex new tasks (Neumann, 2015).</td>
<td>4. Selecting a transshipment method</td>
</tr>
<tr>
<td>---</td>
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</tr>
<tr>
<td>One is aware of the different transshipment methods for goods and transports and know the characteristics as well as the costs in order to be able to calculate and to know in which cases transshipments are to be used and when this is worthwhile. In this respect one must be able to make decisions and present them to the customer in a self-confident and convincing way.</td>
<td></td>
</tr>
<tr>
<td>5. Showing Environmental Awareness</td>
<td></td>
</tr>
<tr>
<td>One is aware of the effects of transport decisions and concepts and has acquired the knowledge of how to minimise or eliminate the effects, without having to pollute the environment to a large extent. One is able to develop environmentally friendly transport concepts and present them convincingly to the customer.</td>
<td></td>
</tr>
<tr>
<td>6. Dealing with innovations</td>
<td></td>
</tr>
<tr>
<td>One is able to question existing processes and to grasp the cause-and-effect relationships. One has the knowledge to develop new ways and/or new processes and to interrupt existing behaviour patterns. Further, one can apply existing technologies in new circumstances; apply new technology in existing business situations. One is creative and able to develop new ideas and to envision possibilities.</td>
<td></td>
</tr>
<tr>
<td>7. Dealing with Digitalisation</td>
<td></td>
</tr>
<tr>
<td>One must have technical knowledge. As well as critical questioning of the current processes, thinking outside the box, problem-oriented, creative and strategic thinking to be able to implement projects and ideas and to present and argue them with good communication and transmitted knowledge.</td>
<td></td>
</tr>
<tr>
<td>Social and personal competencies refer to the ability to act in a social context (Neumann, 2015).</td>
<td>8. Showing Endurance – Perseverance</td>
</tr>
<tr>
<td>One is able to cope with the changing circumstances in the logistics industry and can deal with difficult situations such as pressure and resistance, while standing up for one’s own opinion self-confidently and independently. One can argue these plausibly or develop a strategy (e.g. in relation to sustainability or innovation) to convince others.</td>
<td></td>
</tr>
</tbody>
</table>

As mentioned before, competencies can be divided into different dimensions and into core and key competencies. After defining the necessary competencies for logistics students one can consider transshipment methods, and multimodal transportation as two of the key factors that play an important role for IWT as in many cases this requires a transshipment or the combination of different means of transport if the start and end station are not on the waterside.

The selection of modes of transport is part of the core competencies that are crucial for any logistics provider, regardless of the means of transport. The same accounts for sustainability, innovation, and digitisation that represent an opportunity for inland navigation but will be of significance for the whole logistics industry.

The competence endurance plays a special role for the mind shift mentioned above, it has become clear that especially the attitude must change at the industry as well as at the customers regarding
flexibility and scheduling. To generate this mind shift and to integrate inland navigation more strongly, endurance is of utmost importance and plays a major role as key competence in logistics and in the development of holistic transport concepts, which should be regarded as core competence.

4.4 Learning Goals

As a further process in the development of suitable e-learning material based on the identified competencies, learning goals should be defined. According to Štulina et al., “learning outcomes are clear and assessable statements that define what a student is able to DO by the completion of a course or a programme [...]” (Štulina et al., 2017). This is necessary because competencies are intangible and difficult to assess. Further, learning objectives provide a well-structured setup that provides the student with what he or she can expect of the material (Štulina et al., 2017).

To define learning goals, Bloom’s taxonomy has been used as part of the conceptual framework and a special list of verbs that is provided by Pearson for the development of learning goals (Davis, 2014). The different levels build on each other and form the basis to reach the next layer. Later the learning goals can be connected to the collection of the learning material. Following, the learning goals are listed based on the competencies.

Table 4 Learning Outcome: Selecting a mode of transport

<table>
<thead>
<tr>
<th>Competency 1: Selecting a mode of transport</th>
<th>Learning Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Level</strong></td>
<td></td>
</tr>
<tr>
<td>Knowledge</td>
<td>- The student is able to identify a decision situation.</td>
</tr>
<tr>
<td></td>
<td>- The student is able to name all modes of transports (Truck, Ship, Inland waterway vessel, Train)</td>
</tr>
<tr>
<td>Comprehension</td>
<td>- The student is able to distinguish the key characteristics of the modes of transport</td>
</tr>
<tr>
<td>Application</td>
<td>- The student is able to choose an appropriate mode of transport for his or her task</td>
</tr>
<tr>
<td>Analysis</td>
<td>- The student is able to analyse which modes of transport are suitable</td>
</tr>
<tr>
<td>Synthesis</td>
<td>- The student is able to construct a transport solution based on the selection</td>
</tr>
<tr>
<td>Evaluation</td>
<td>- The student is able to evaluate his or her own scope of decision</td>
</tr>
</tbody>
</table>
### Table 5 Learning Outcome: Selecting a transshipment method

<table>
<thead>
<tr>
<th>Competency 2: Selecting a transshipment method</th>
<th>Learning Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Level</strong></td>
<td><strong>Knowledge</strong></td>
</tr>
<tr>
<td><strong>Comprehension</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Application</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Analysis</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Synthesis</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Evaluation</strong></td>
<td></td>
</tr>
</tbody>
</table>

### Table 6 Learning Outcome: Planning a holistic transport concept

<table>
<thead>
<tr>
<th>Competency 3: Planning a holistic transport concept</th>
<th>Learning Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Level</strong></td>
<td><strong>Knowledge</strong></td>
</tr>
<tr>
<td><strong>Comprehension</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Application</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Analysis</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Synthesis</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Evaluation</strong></td>
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<td></td>
<td></td>
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</tbody>
</table>

### Table 7 Learning Outcome: Developing multimodal transport solutions

<table>
<thead>
<tr>
<th>Competency 4: Developing multimodal transport solutions</th>
<th>Learning Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Level</strong></td>
<td><strong>Knowledge</strong></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Comprehension</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Application</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Analysis</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Synthesis</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Evaluation</strong></td>
<td></td>
</tr>
</tbody>
</table>
It is difficult to link social competencies to learning objectives as these have a great influence on a person’s character and result from experience with social situations. Therefore, only parts of the competence can be transferred in the form of learning objectives. The same accounts for innovation since this is partly influenced by character traits like creativity and is, therefore, difficult to assess or to convey with certain knowledge.

Table 8 Learning Outcome: Showing Endurance - Perseverance

<table>
<thead>
<tr>
<th>Competency 5: Showing Endurance - Perseverance</th>
<th>Learning Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>The student is able to identify changing circumstances in the industry</td>
</tr>
<tr>
<td>Comprehension</td>
<td></td>
</tr>
<tr>
<td>Application</td>
<td></td>
</tr>
<tr>
<td>Analysis</td>
<td></td>
</tr>
<tr>
<td>Synthesis</td>
<td></td>
</tr>
<tr>
<td>Evaluation</td>
<td>The student is able to defend his or her choices and his or her own point of view and that of others</td>
</tr>
</tbody>
</table>

Table 9 Learning Outcome: Dealing with innovation

<table>
<thead>
<tr>
<th>Competency 6: Dealing with innovation</th>
<th>Learning Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>The student is able to memorize important knowledge about his or her field of expertise</td>
</tr>
<tr>
<td>Comprehension</td>
<td>The student is able to recognise important inputs</td>
</tr>
<tr>
<td>Application</td>
<td>The student is able to demonstrate new ideas and solve problems in his field of expertise</td>
</tr>
<tr>
<td>Analysis</td>
<td>The student is able to point out suggestions of improvement</td>
</tr>
<tr>
<td>Synthesis</td>
<td>The student is able to develop new ideas</td>
</tr>
<tr>
<td>Evaluation</td>
<td>The student is able to assess new ideas and evaluate the feasibility of an idea</td>
</tr>
</tbody>
</table>
Table 10  Learning Outcome: Showing Environmental Awareness

<table>
<thead>
<tr>
<th>Competency 7: Showing Environmental Awareness</th>
<th>Learning Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level</td>
<td></td>
</tr>
<tr>
<td>Knowledge</td>
<td>- The student is able to recall knowledge of how to minimise or eliminate negative effects of transport</td>
</tr>
<tr>
<td>Comprehension</td>
<td>- The student is able to identify the effects of transport decisions</td>
</tr>
<tr>
<td>Application</td>
<td>- The student is able to choose transport solutions that minimise or eliminate the negative environmental effects</td>
</tr>
<tr>
<td>Analysis</td>
<td>- The student is able to analyse the effects of his or her decisions on the environment</td>
</tr>
<tr>
<td>Synthesis</td>
<td>- The student is able to arrange an environmentally friendly transport concept</td>
</tr>
<tr>
<td>Evaluation</td>
<td>- The student is able to argue for his or her decision</td>
</tr>
</tbody>
</table>

Table 11  Learning Outcome: Dealing with digitalisation

<table>
<thead>
<tr>
<th>Competency 8: Dealing with digitalisation</th>
<th>Learning Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level</td>
<td></td>
</tr>
<tr>
<td>Knowledge</td>
<td>- The student is able to identify technical possibilities</td>
</tr>
<tr>
<td>Comprehension</td>
<td>- The student is able to review the current situation (of a process or organisation)</td>
</tr>
<tr>
<td>Application</td>
<td>- The student is able to interpret and solve problems and situations</td>
</tr>
<tr>
<td>Analysis</td>
<td>- The student is able to criticize the current state</td>
</tr>
<tr>
<td></td>
<td>- The student is able to point out suggestions of improvement</td>
</tr>
<tr>
<td>Synthesis</td>
<td>- The student is able to develop new ideas</td>
</tr>
<tr>
<td></td>
<td>- The student is able to create new processes</td>
</tr>
<tr>
<td></td>
<td>- The student is able to think outside the box</td>
</tr>
<tr>
<td>Evaluation</td>
<td>- The student is able to defend his or her choices for the transport concept</td>
</tr>
<tr>
<td></td>
<td>- The student is able to explain complex relationships</td>
</tr>
</tbody>
</table>
4.5 Learning Material

Finally, the selection for e-learning material for the online platform of bremenports takes place. bremenports aims to provide learning material on voluntary bases for students to gain the prior identified competencies.

The e-learning platform will be asynchronous, which means that students acquire knowledge by self-study, on demand and on a voluntary basis. Mr Boll (2019, ln 262-265) mentions that one must provide a learning environment for young people that they accept, which is, in his opinion, a digital learning environment. Otherwise, one would not be able to attract young people anymore. Mr Nölke (2019, ln 372-374) also sees added value in e-learning modules and said that his organisation has already been interested in this topic. E-learning offers bremenports clear advantages, as no teacher or location is required. Students have the advantage of having access to the materials from anywhere through their mobile phones, tablets or laptops and can decide when they want to learn, as there are no fixed teaching times. Participants need between 25% and 60% less time to learn than with traditional media because they can learn the content that applies to them and can take the time they need (Gupta, 2017).

First, current trends and the characteristics of inland navigation could increase the attention of participants, especially if a certain aha effect could be created (Bruns-Vietor, 2019, ln 261). For example, the inland waterway can be used for up to sixty years mentions Ms Bruns-Vietor (2019, ln 262-263). This is being supported by Štulina et al. (2017) who state that “in the online environment, motivation can be increased by engaging content with surprising elements, [...] and examples” (Štulina et al., 2017). Examples could be used in the form of field reports from industry professionals; lifelike stories could bring the student closer to the topic (Zink, 2019, ln 384). Additionally, realistic invitations to tender from companies could be used for students to apply their knowledge and develop an understanding of the importance of inland navigation as a mode of transport (Zink, 2019, ln 323-324).

For the active learning and the mediation of competencies, Mr Peterson (2019, ln 426-428) mentioned case studies. They could be provided by the different project partners of the #IWTS 2.0. According to Walker, Leary, Hmelo-Silver and Ertmer “case studies [...] promote active learning and engage the learners in higher-order thinking processes, such as analysis and synthesis” (Walker, Leary, Hmelo-Silver, & Ertmer, 2015). Thereby, students develop critical thinking skills by assessing the material and identifying interrelations or misleading (Walker et al., 2015). This confirms Ms Bruns-Vietor (2019, ln 240) and Mr Alias (2019, ln 236-238) notes that it would be particularly useful to use case studies which demonstrate when the inland ship is profitable. However, case studies already set a particular goal, which results in the student having less incentive to develop their own ideas. Another possibility is the problem-oriented learning (Bruns-Vietor, 2019, ln 247-253). Problem-orientated learning, “[...
empowers learners to conduct research integrate theory and practice and apply knowledge and skills to develop a viable solution to a defined problem” (Walker et al., 2015).

Besides, excursions and having seen something can reduce reservations and make students aware of the consequences of their actions (2019, Bruns-Vietor, In246) (Boll, 2019, In 272) (Zink, 2019, In 283). However, this is not possible on the online platform alone.

Nevertheless, this illustrates that a practical learning approach is of great importance for the learning portal. The importance of the close relationship to reality is also confirmed by Štulina et al. (2017) who highlights that if it is comprehensible to the learner why the material and learning contents are relevant, then this is reflected positively in the learning process.

As mentioned before, the DAV is working closely together with an industry practitioner to teach IWT. Ms Vasterling-Will (2019, In 119-121) believes as well that it would be useful if there would be experts to give the students insights. As a personal contact via the online platform is not feasible; this could perhaps be made possible by the abovementioned experience reports. However, Mr Zink (2019, In 385) stresses also that the co-operation with the practitioner is so successful because he is the opposite of the dusty image of the inland navigation. Thereby, he is an opportunity for the students to identify themselves better with the topic (Zink, 2019, In 372-383). In this context, a possible cooperation with the shipping company Dettmer or Rhenus could be considered. Albert Banduras developed three forms of social learning in his social cognitive theory. Part of this theory is identification learning, where the attractiveness lies in the observed person whose behaviour one wants to copy (Stangl, 2019). This partly supports the fact that the use of a role model can contribute to the learning process. Additionally, the growing number of influencers demonstrates what effect a role model can have (Fastenau, 2018). Therefore, a practitioner that young people can identify with could also contribute to an improved image for IWT.

PowerPoint presentations can be used to convey knowledge and facts. This is a potent tool for the e-learning platform if one considers the limitations of money and technological know-how. Most instructors and users are familiar with the tool, and it is not expensive. Additionally, it can be used for a variety of materials as presentations, videos or case studies (Štulina et al., 2017). Regarding the content, the company could use existing internal information and documents.

Clark and Mayer (2016) highlight the importance of the combination of spoken or written words and graphics which is called multimedia presentation and enriches the learning experience. If complex graphics are displayed spoken words that the user can listen to are recommended as the information can be better processed in this way and an overload of visual information is avoided. Besides, it is important to not only use decorative graphics but ensure an added value for example by using
organisational or transformational graphics. For the development of the material only necessary content should be included and a friendly and personalized tone used (Clark & E. Mayer, 2016).

A further useful material are movies on the platform (Bruns-Vietor, 2019, ln 254) (Zink, 2019, ln 384). Since the user of an e-learning programme does not only receive knowledge but must actively participate in order to learn, it is essential that the content is presented in different varieties and that a right mix of materials is provided for the user to engage better (Štulina et al., 2017). Already existing promotion and information videos from the #IWTS 2.0 project could be used. Further, the content should be offered in small steps with explanations and examples (Štulina et al., 2017).

The learning material can be connected with the different cognitive levels of the learning outcomes. First students gain knowledge about the individual characteristics of the modes of transport, especially about inland navigation. Knowledge can be conveyed by combining audio files or text with graphics in presentations. Based on the knowledge, it can be aimed for a higher cognitive level for example by selecting a mode of transport and applying the knowledge. Through the exchange with other users in a chat experiences and knowledge can be shared. The use of videos and case studies demonstrate the possibilities of inland navigation and encourages new solution approaches. In turn, these demonstrations can increase the visibility of inland navigation and make it more interesting, especially in terms of innovation and digitalisation. Finally, the highest level of synthesis and evaluation can be achieved through problem-oriented learning as realistic tenders.

Even though bremenports can create many learning opportunities and the e-learning platform was considered useful in the interviews, Mr Alias (2019, ln 342) stressed that this content should already be represented in the university and pointed out that if one were to learn inland navigation at an early stage, it would automatically become part of the solution process for the logisticians and therefore most effective.
5. Conclusion

This research project aims to support bremenports in the development of an online learning inventory for logistic students in Germany by identifying competency gaps between the logistics higher education institutions and the expectations of the industry.

To understand which form of learning material should be used on the e-learning platform of bremenports, it was first necessary to determine if students have a competence gap and to what extent. Therefore, it was first examined which contents are currently being taught at universities in the North-West of Germany. Four logistics study programmes and business administration courses, in which logistics is part of the course of study, were investigated. The curricular have strongly highlighted the underrepresentation of inland navigation as a mode of transport. While the term inland navigation only appeared in the logistics courses at two universities and only to a small extent, inland navigation as part of the logistics courses in business administration studies did not appear at all. These results found clear support in the expert interviews. Here it was confirmed that inland navigation is hardly part of the lessons any more, both by experts of the industry and the education experts. The reason why inland navigation is no longer taught is on the one hand due to the "dusty" image of inland navigation, being very traditional and slow. Moreover, since many lecturers are no longer familiar with the topic and develop a kind of blind spot for it, this can also be influenced by the lecturer’s field of study. Therefore, it can also be teacher-dependent whether the topic is being taught or not. A further reason is the assumption that the topics of modes of transport and inland navigation are at least dealt with during the apprenticeship, taking place prior the studies, which, according to the experts, is no longer the case.

The combination of unawareness and bad image leads to the fact that inland navigation is not taught, and students are therefore not aware of its possibility. This results in future decision makers automatically excluding inland navigation from their selection process.

To answer which competencies logistics students, have to learn to consider inland navigation as a mode of transport in their choice of logistic chains this report investigated which competencies should be taught to bring inland navigation back on the radar of logistics students. As a basis, students should first be reminded that inland navigation exists and what characteristics and what possibilities it offers. These characteristics should be generally discussed for each mode of transport. Building on this, the logistics student can and should be able to choose a mode of transport as the first of the competencies. Secondly, students should be able to combine different modes of transport and thirdly be able to design a holistic transport concept. These competencies form technical competences that students need in order to fulfil specific tasks in a goal-oriented way and that are, according to the interviews,
vital competencies that each logistician should have. Also, it is important that students learn the competence of transshipment methods, to make inland waterway transport easier and smoother, since goods must often be transhipped when the start and end station of the transport is not on the waterside. For the development of the industry an understanding of the environment, innovation and digitalisation is also of great importance, as the logistics industry is changing due to new circumstances that need different transport solutions, such as the increasing traffic. Besides, the inland shipping industry is in a process of modernisation. Handling techniques, digitalisation, innovation and environmental awareness are part of the methodical competencies that students must be able to apply across disciplines. Finally, it is particularly important that students have endurance. The inland navigation industry, as well as the logistics industry, is in a state of change, and the inclusion of inland vessels for transport solutions, depends especially on the mind shift of future decision makers in logistics. It is particularly important that future decision makers can create holistic transport concepts that take all factors into account and engage with innovation, digitalisation and environment and persevere in driving this mind shift forward in the industry by going new ways. Rethinking and being ready to go new ways is one of the industry’s most frequently mentioned expectations.

Since competencies are not measurable, and it would be difficult to recognise whether students are successfully learning on the e-learning platform, learning objectives were developed based on the competencies following blooms taxonomy. The learning objectives are divided into different difficulty and learning levels which can then be adapted to the learning materials to impart the competences in an appropriate way.

Finally, to answer in which form learning material should be delivered on the internet platform of bremenports for logistics students to acquire missing competences, the materials were identified based on the competencies. The e-learning portal will be asynchronous, which will bring bremenports both costs and effort benefits, as well as making learning easier for the students. It is important to present current trends and characteristics of inland navigation. This can happen mainly through the combination of graphics and written or spoken text. Also, a mix of materials such as PowerPoint presentations, videos, case studies and problem-oriented tasks, that could be provided by project partners and existing materials of the #IWTS 2.0 project, are advisable. Besides, a chat for the interaction between the participants is a useful tool to support the learning process. The materials can also be adapted to the learning outcomes and thus to the learning level. Additionally, the learning content should be taught in smaller units. The development of the content should be reduced to the most important points and formulated in a friendly tone. Particularly important is the close relation to practice, which illustrates the importance of inland navigation. Here, experience reports from
practitioners from the industry could help and offer a kind of identification figure for young people that makes inland navigation more attractive and appealing again.

In conclusion, this means that there is a big knowledge gap between what students learn about inland navigation at the university and what the industry expects them to be able to do. As part of the project, the aforementioned eight competencies could be identified and should be developed on an asynchronous e-learning platform with a strong practical focus, a combination of different materials such as PowerPoints, videos, case studies, field reports and an interactive chat for the participants to exchange experiences. The learning content should be dealt with at the university, but bremenports can also contribute to making inland navigation more present again in the minds of future decision-makers in logistics.
6. Recommendation

Finally, recommendations shall be given to bremenports which learning material should be developed for the e-learning platform to support the increased usage of inland waterways based on the identified competencies. The recommendations are divided into fundamental characteristics of the e-learning platform, material that is feasible to be implemented in the short term, and material that will develop in the long term.

For a feasible implementation of the learning portal regarding technological know-how and money constraints it is generally recommended that bremenports develops an asynchronous e-learning program. Thereby, the company will not need to employ a trainer, set specific times for learning lessons or find a location, which offers a monetary value as well.

It is counselled to connect the learning content with the cognitive levels of the learning goals. This can be helpful in determining whether a student is making progress, as learning outcomes are more measurable than competencies. Further, it is highly recommended to use a multimedia presentation to improve the learning process and make it easier for the user to comprehend the information by using a combination of graphics and written or spoken text. If the graphic is complex, it is advised to use spoken words in addition to avoid an overload of visual information. For the development of content, a friendly and personalised tone should be used. The content should be provided in small learning units or chapters to avoid that the student is confronted with too much new information.

In the short term, bremenports should provide general information about the characteristics of IWT which one can compile from already existing internal materials and knowledge. For the user of the portal to engage with the material it is advised to use a mix of different types of material. As for materials to be used, it is counselled to use movies to illustrate current trends or possibilities within the IWT industry, for which one can use already existing promotion videos from the #IWTS 2.0 project. PowerPoint can be used for the development of presentations with or without narration, graphics or case studies. Thereby, PowerPoint offers a cost advantage and the advantage that in most cases, the instructor and the user of the platform are already familiar with the program. Case studies, as part of the learning material, are providing the user with the possibility for active learning and examples of how IWT is already being used today. For this purpose, reports from partners of the Interreg project can be used, which thus represent the multitude of possibilities of IWT.

In the long term, bremenports is advised to develop problem-oriented tasks that address an even higher level of learning. In addition, realistic tenders should be used that establish a close relationship to reality and reflect the possibilities and importance of inland navigation. For the close relation to
In the context of realistic teaching, it is recommended to give additional examples in the form of experience reports from practitioners of the industry. These could be developed in cooperation with the shipping companies such as Dettmer or Rhenus. In the future, cooperation with a practitioner should be introduced, who can be regarded as a role model for inland navigation and will thereby become an identification figure for students through regular reports. In addition, a chat should be set up to enable the participants to exchange information. In this context, close cooperation with the project partners as well as with actors of the industry is recommended, which will develop in the long term within the framework of the project.

Finally, it is recommended for further research to investigate a larger radius of universities and contents dealing with inland navigation to get an overview of the whole situation in Germany and to extend the impact of the e-learning program. The process of developing the e-learning portal will be continually evolving, for further research and the implementation it is recommended to use the ADDIE model, described in the literature review, as a guide or support. Besides, in the investigation of the reasons why inland navigation is no longer taught, the topic of the bad image should be examined more closely, and the factors that make up a bad image should be identified. Regarding the further development of the e-learning portal, further research could establish a close link between the e-learning portal of bremenports and the industry. The cooperation can achieve a mutual benefit in the form of publicity for the industry and essential content for the e-learning portal.
References


Nele Sophie Albers 352753


Will, U. (2019, April 08). Interview Transcript Uwe Will. (N. S. Albers, Interviewer)


Zink, T., & Peterson, G. (2019, April 09). Interview Transcript Thomas Zink and Gunnar Peterson. (N. S. Albers, Interviewer)
## Appendices

### Appendix A: List of possible interview partners

<table>
<thead>
<tr>
<th>Institution</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Higher Education Logistic</strong></td>
<td></td>
</tr>
<tr>
<td>1. University of applied sciences Osnabrück</td>
<td>Prof. Dr. Freye</td>
</tr>
<tr>
<td></td>
<td>Prof. Dr. Bruns-Victor</td>
</tr>
<tr>
<td>2. University of applied sciences Bremen</td>
<td>Prof. Dr. Witting</td>
</tr>
<tr>
<td>3. University Bremen</td>
<td>Prof. Dr. Haasis</td>
</tr>
<tr>
<td>4. Jade University of applied sciences</td>
<td>Prof. Dr. Wengelowski</td>
</tr>
<tr>
<td>5. University of applied sciences Bremerhaven</td>
<td>Prof. Dr. Ritzenhoff</td>
</tr>
<tr>
<td>6. Logistikschule der Bundeswehr</td>
<td>Mr. Heckmann</td>
</tr>
<tr>
<td>7. Deutsche Außenhandels- und Verkehrsakademie German Foreign Trade and Transport Academy</td>
<td>Mr. Zink</td>
</tr>
<tr>
<td></td>
<td>Mr. Peterson</td>
</tr>
<tr>
<td>8. University of applied sciences Wismar</td>
<td>Prof. Dr. Reise</td>
</tr>
<tr>
<td>9. University of applied sciences Flensburg</td>
<td>Prof. Boy</td>
</tr>
<tr>
<td>10. World Maritime University</td>
<td>Prof. Song</td>
</tr>
<tr>
<td><strong>Industry Experts</strong></td>
<td></td>
</tr>
<tr>
<td>11. Groningen Seaports</td>
<td>Erik Berthold</td>
</tr>
<tr>
<td>12. Shortsea Shipping Promotion Centre Germany</td>
<td>CEO Mr. Nölke</td>
</tr>
<tr>
<td>13. Previous CEO of via Bremen</td>
<td>Mr. Will</td>
</tr>
<tr>
<td>15. North German Waterway Logistic</td>
<td>Ms. Beplat</td>
</tr>
<tr>
<td>16. Maritime Académie of Harling</td>
<td>Mr. Boll</td>
</tr>
<tr>
<td>17. Bayernhafen GmbH &amp; Co. KG</td>
<td>Ms. Hohberger</td>
</tr>
</tbody>
</table>
Appendix B: Description of the selection of interviewed experts

The interview partners for the project were carefully selected together with the company supervisor Dr. Stemmler, who contacted several possible interview partners first to find out if they would be willing to participate in an interview. The first interview was conducted with Mr. Will who was selected based on his experience in politics regarding inland waterway transportation, but also as the former director of the Via Bremen, the marketing organisation for the port industry in Bremen and his experiences with contacts from the industry. Also, he still works today as a consultant for bremenports.

Secondly, an interview was conducted with Mr. Zink and Mr. Peterson, who are both lecturers in the logistics field. Mr. Zink and Mr. Peterson were chosen because they were able to report about the current state of universities, whether inland navigation is taught, how and why not. In addition, as lecturers, they were able to give important insights into possible learning materials. This also applies to Ms. Bruns-Vietor, who teaches logistics at the University of Applied Sciences in Osnabrück. Ms. Bruns-Vietor was also a lecturer at another institution and worked in the field of logistics. Thus, she was able to give an understanding of different areas.

Furthermore, as a project partner of #IWTS 2.0 and as a project planner at the Maritime Academy Harlingen, Mr. Boll was able to give a very good insight into inland navigation and the training of an inland waterway skipper. Besides, he gained a lot of personal experience in this field because his parents are skippers and own a boat. He made a valuable contribution by the combination of specialised knowledge of the industry and training. Additionally, Mr. Alias was chosen for an interview since he is working on a similar project related to education in inland navigation. He is very familiar with the contents taught at universities in the field of logistics from his studies and through his work. Mr. Alias was able to give a very clear understanding of the current situation of the inland navigation industry as well as the field of education. At the same time, he gave a good insight into the possible future development. In the context of a conference, another expert could be won for an interview, Mr. Eckel from the RheinCargo GmbH. Mr. Klippel also took part in the interview, a younger colleague who was able to report from his own experiences in logistics studies. Mr. Eckel was a very important interview partner because his company represents the kind of companies in which the later logistics students will work at, and it was, therefore, important to know what his expectations are, and which competencies are important in his opinion. As a further interview partner, Mr. Nöike was very important, because, with his organisation SPC, he is also committed to making inland navigation more significant again. The SPC also aims at young people. His insight into the topic, the knowledge about learning and universities and the strong relation to inland navigation gave important information for this work. Ms. Vasterling-Will was able to give important additional information with her position in
the Senate, but also about the state of inland navigation and possible problems. Finally, a conversation with Mr Poser from the shipping company Dettmer could be held, which was important concerning the industry perspective.
Appendix C: List of Universities in North-West Germany

Table 13 List of Universities in North-West Germany

<table>
<thead>
<tr>
<th>University</th>
<th>Location</th>
<th>Study Program</th>
<th>Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Logistics Studies</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>University of Applied Sciences Bremerhaven</td>
<td>Bremerhaven</td>
<td>Transport / Logistics</td>
<td>Bachelor</td>
</tr>
<tr>
<td>Technical University Ostwestfalen-Lippe</td>
<td>Lemgo</td>
<td>Internationale Logistics</td>
<td>Bachelor</td>
</tr>
<tr>
<td>Jade University of Applied Sciences Wilhelmshaven/Oldenburg/Elisfleth</td>
<td>Elisfleth</td>
<td>International Logistics Management</td>
<td>Bachelor</td>
</tr>
<tr>
<td>Gottfried Wilhelm-Leibniz-University Hannover</td>
<td>Hannover</td>
<td>Production und Logistics</td>
<td>Bachelor</td>
</tr>
<tr>
<td>German Foreign Trade and Transport Academy</td>
<td>Bremen</td>
<td>International Logistics Management</td>
<td>Bachelor</td>
</tr>
<tr>
<td><strong>Business Administration Studies</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>University of Applied Sciences Emden/Leer</td>
<td>Leer</td>
<td>Business Administration</td>
<td>Bachelor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1 Semester Production and Logistics</td>
<td></td>
</tr>
<tr>
<td>University of Applied Sciences Osnabrück</td>
<td>Osnabrück</td>
<td>Business and Management</td>
<td>Bachelor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1 Semester Marketing and Logistics</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>- 2 Semester Logistic- Management corporate logistics</td>
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<tr>
<td></td>
<td></td>
<td><strong>Specialisation</strong></td>
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<tr>
<td></td>
<td></td>
<td>- Industry Logistics A - Automotive, Logistics Service Provider</td>
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<tr>
<td></td>
<td></td>
<td>- Industry logistics B - Aviation, trade</td>
<td></td>
</tr>
<tr>
<td>University of Applied Sciences Bremen</td>
<td>Bremen</td>
<td>Business Administration</td>
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<tr>
<td></td>
<td></td>
<td>- 2 Semester Production und Logistics</td>
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<tr>
<td>University of Applied Sciences and Art Hannover</td>
<td>Hannover</td>
<td>Business Administration</td>
<td>Bachelor</td>
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<td></td>
<td></td>
<td><strong>Specialisation</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Supply Chain Management</td>
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</table>
Appendix D: Geographical delimitation of the North-West of Germany

*Figure 6* Map of North-West Germany

Appendix E: Interview Guiding Questions Educational Experts

In the following the document is being displayed that was sent to the educational experts ahead of the interview to give a brief introduction into the topic of the project and the goal. In addition, the guiding question were sent to the interviewee for them to prepare if they liked to.

Interview Document

Dear Ms/Mr ……,

Thank you for agreeing to conduct an interview with me on the subject of inland navigation as part of my graduation project.

This research aims to find out, for bremenports, which competencies logistics students need to consider inland navigation as a useful mode of transport in the future. For this purpose, I would like to point out possible competence gaps between the contents of the logistic studies and the expectations of the industry.

On the basis of these competencies, I would like to find out which learning materials are best suited to impart the missing competencies to the students. The material will be made available to students on an online platform by bremenports in the future.

Please note that competencies are defined in this project as a combination of knowledge, skills, abilities and other characteristics required for effective performance for specific activities.

1. What opportunities do you see in inland navigation?

2. How far do you integrate inland navigation as a topic into the study content?

3. (If IWTs is integrated) In which courses is inland waterway transport covered?

4. Do you believe any additional content should be covered?

5. What do you believe, why is inland navigation partly or no longer taught as part of the logistics course?

6. Which competencies do you think are needed to actively involve inland navigation as a mode of transport?

7. Often, profession-specific competencies are linked to the mission, vision and goals of a company. What would you call the goals or mission of the inland navigation industry?

8. As a lecturer, what do you think are the most effective learning materials for teaching competencies?

9. What are your personal expectations for future decision-makers in the logistics sector?

10. Please add any information you would like to share with me that I have not asked for.
Appendix F: Interview Guiding Questions Industry Experts

In the following the document is being displayed that was sent to the industry experts ahead of the interview to give a brief introduction into the topic of the project and the goal. In addition, the guiding question were sent to the interviewee for them to prepare if they liked to.

Interview Document

Dear Ms/Mr ….,

Thank you for agreeing to conduct an interview with me on the subject of inland navigation as part of my graduation project.

This research aims to find out, for bremenports, which competencies logistics students need to consider inland navigation as a useful mode of transport in the future. For this purpose, I would like to point out possible competence gaps between the contents of the logistic studies and the expectations of the industry.

On the basis of these competencies, I would like to find out which learning materials are best suited to impart the missing competencies to the students. The material will be made available to students on an online platform by bremenports in the future.

Please note that competencies are defined in this project as a combination of knowledge, skills, abilities and other characteristics required for effective performance for specific activities.

1. What opportunities do you see in inland navigation?
2. What do you think are the reasons that inland navigation is not fully exploited, despite its advantages?
3. Do you believe any additional content should be covered for logistics students?
4. Which competencies do you think are needed to actively involve inland navigation as a mode of transport?
5. Often, profession-specific competencies are linked to the mission, vision and goals of a company. What would you call the goals or mission of the inland navigation industry?
6. Which learning materials do you think are most effective for teaching competencies?
7. What are your personal expectations for future decision-makers in the logistics sector?
8. Please add any information you would like to share with me that I have not asked for.
Appendix G: Original German Transcripts

The original German transcripts as well as the recording of the interviews can be found as a digital file on the provided USB stick.
Appendix H: Translated English Transcripts

H.1 Interview Transcript Uwe Will

<table>
<thead>
<tr>
<th>Interview Information</th>
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<tbody>
<tr>
<td>Date: 08.04.2019</td>
</tr>
<tr>
<td>Place: bremenports GmbH &amp; Co. KG</td>
</tr>
<tr>
<td>Duration: 10:00 a.m. till 11:30 a.m.</td>
</tr>
<tr>
<td>Audio recording: Yes</td>
</tr>
<tr>
<td>Face to Face or Phone conversation: Face to Face</td>
</tr>
<tr>
<td>Additional Information: Mr. Will has a strong political background. Dr. Stemmler was present at the interview too, to collect information for the internal #IWTS 2.0 project. The interview had to be shortened in some places, because the information was not target-oriented for the interview.</td>
</tr>
<tr>
<td>Member Check?: No</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Information about the interview</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name: Uwe Will</td>
</tr>
<tr>
<td>Nationality: German</td>
</tr>
<tr>
<td>Occupation: Pensioner and freelance consultant</td>
</tr>
<tr>
<td>Working experience: - Government Director and Senate Councillor to the Senator for Ports, Shipping and Transport</td>
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<td>- Head of the department for international projects at bremenports (predecessor of Dr. Stemmler)</td>
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<td>- Board member and managing director of Via Bremen (marketing organisation for shipping traffic in Bremen)</td>
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1 General welcome and introduction between Mr Stemmler, Mr Will and Nele Albers, as well as a short introduction to the interview.

2 Nele Albers: Before we start, I would like to give you a brief insight into the project, as you have not yet received the key questions. It's all about trying to find competence gaps, or whether there are competence gaps between what logistics students learn at universities and the expectations of industry. And what these competences are and how they could later be taught in the form of learning materials for the bremenports e-learning portal. So that logistics students can acquire missing competences. We have now defined competences in this work as a
combination of knowledge, skills and abilities that are simply conducive to the successful completion of a specific task.

Nele Albers: I would like to ask in general which possibilities you see in inland navigation? Because you have a lot of experience in the field of logistics.

Uwe Will: I have never been involved in logistics, I have been involved in advertising the logistics industry and promoting the industry. Basically, there is a lot to be done in inland navigation as in short sea shipping, but that is certainly not the issue here, but there should be a lot of potential in inland navigation. In my view, this potential has not yet been realised. But when we think of the northern German canal network, we also have some restrictions to contend with when it comes to inland waterway transport. That means the depth of the rivers and the insufficient height of the bridges. After all, you have an inland waterway vessel if we are not now assuming that we are talking about building blocks, i.e. sand and gravel transport. That is not required here for this work. Then we will probably be talking more or less about liner traffic, container traffic or general cargo, mass general cargo and heavy goods transports.

Dr. Stemmler: The project had its original roots at one time or another in the use of small inland waterways, which is why it came from the Dutch, who often prefer class five and six up there in Friesland.

Dr. Stemmler: The project was driven, especially by the Maritime Academy Harlingen, because the pupils run out for these smaller inland ships, because nobody uses them anymore. They just try to develop business models, let me say quite flatly, innovations as we call them. Our task in our subproject is to create a learning inventory so that we can also tell the logistician that this is what you can do to get inland navigation on your mental radar. In this context, as you rightly say, as small units as possible, which are in focus no matter what is transported with them.

Dr. Stemmler: I don't think the Harlingers care about that for now.

Uwe Will: Well, so we've got all this in view. Then it's right and exactly these smaller units are not very en vogue today.

Uwe Will: We speak here rather of the 80 metres of inland waterway vessels, the hundred metres of inland waterway vessels or the 110 metres of inland waterway vessels, which then require corresponding conditions on the rivers. Now that we are here on the Middle Weser, we are slowly putting the Middle Weser in a state where 110 metres of ships or 100 metres of ships can also sail there, or even two can pass each other.

Uwe Will: But that's true, these smaller rivers also have potential. This is not exactly the case here. We don't have many canals here.

Uwe Will: In Hamburg, I don't think the canals are suitable yet so that you can drive around a lot on them, but that's true for the Netherlands or in Belgium there are more possibilities there. I also understand that the project also thinks a lot about, let's say, island solutions, which are only tailor-made for a certain situation. When we think of Sweden, this canal that passes the city of Gothenburg, that is a very special situation and you can do something tailor-made for it and one can possibly learn from the other.

Uwe Will: Perhaps the situation in Scotland is similar to that in Sweden. We will never be able to compare ourselves up here with the situation on the Rhine. And the next tributary of the Rhine, the Neckar, is different again. The Mosel is different again. The Mosel is better placed.
than the Mittelweser. Then we have the Elbe, respectively the Elbeseitenkanal which offers completely different possibilities for inland navigation. But now actually the example of this morning, how many lorries were here in front of me? And trucks are actually everywhere and cars are in between. And there are also very large lorries and very small lorries in the lorries, then there is this Sprinter class and then there are the very large ones and the very large ones don’t go everywhere either. So you have to have a small one and I have to reload. And if I manage to get two or three large lorries into a small corner and not into it, but a barge into it, then a lot has already been won. Today we are talking about barges that have 60 TEU and that travel back and forth between Bremen and Minden. On the Rhine, these are completely different dimensions.

Uwe Will: That would mean 60 trucks less on the way to Minden.

Uwe Will: But if I take a Dutch city and there are some examples in the movies, the videos that are shown where a certain company says: For me it makes sense to load my products immediately on the inland ship and to transport a short distance to the big seaport before 20 trucks torture themselves through here. So, and for me it was always a little bit, I come from the corner of port politics or transport politics, I was over 20 years speaker for port political affairs and for transport political affairs. You can’t build the car-friendly city and you can’t build the car-friendly hinterland anymore. We cannot extend all motorways to four or five lanes; even with a four-lane extension, there will still be some with their Dacia Duster in the middle of the road and then block everything or drive the trucks side by side with three. We can’t do that. We can’t get the car friendly city that would be a waste of nature. We can’t ruin everything just so that the concrete is on top or asphalt. In the best case scenario, it will have to be repaired. Then there’s traffic jams again and that leads to too much trouble, and so on. We have the waterway and that is why I have just said that short sea shipping also relieves the burden on cities. Can I give an example? At the beginning of the nineties there was a marketing strategy of the port of Rotterdam which said: " We are the main port of Europe?". Why do you want to go to Bremerhaven, Bremen and Hamburg? Unload it all here. We no longer need to go to Antwerp either. Rotterdam is already doing all that, the Maasvlakte is coming and we’ll get it all away. But now you have to know that almost 80 percent of the traffic to and from the big port of Rotterdam is via the Rhine. But the Rhine does not flow to Lüneburg, not to Magdeburg, not to Hamburg. Here in Bremen, we commissioned an expert opinion. The people of Hamburg had participated benevolently, i.e. not financially but with great benevolence. At the company Planco, the institute calculated the federal traffic route plan at that time. So it had all the data from the Federal Transport Infrastructure Plan available. Since the mid-1990s and when I say something now, it has been DM amounts and no euro amounts, and Planco has then calculated that if the two ports of Bremen and Bremerhaven, I am not even talking about Antwerp, no longer had any international traffic, but all international traffic was routed via Rotterdam, then the Federal Republic of Germany would have had an annual fourth annual traffic volume of DM 1.5 million at that time in the mid-1990s, 5 billion D-Mark beyond the federal traffic route plan must invest in traffic routes, so there was already a four-lane extension in every direction of the motorway around Cologne at that time, railways had to be enlarged to transport it away at all and so discussions about any nature reserves in the area of the Rhine Ruhr area forget it there must be a thick motorway through if we want to cope. The result was something which Bremen also initiated and which is anchored in the trans-European network programme. I am sure you have heard that before.

Uwe Will: The EU Trans-European Networks there is a passage in it that it should be aimed at a radial development of the hinterland so as many ports as possible along the coasts to develop from there radially on short ways the hinterland rather long distance by ship and short distance then on the road. So far so good. This is actually tied to a Bremen demand, but it is a very small demand; we are coming here to one point: costs. We can develop great ideas here the wonderful
fastest super inland waterway vessel. As soon as a forwarding agent or a shipper knows, I have to touch my goods twice more because my factory is possibly not directly on the river. So it has to be transported on a truck to the river, from the truck down to the inland waterway vessel, down again from the ship and on again with the truck. That is the problem. That is why this detour is avoided. I once heard such an extreme example. Why is wine from Spain transported to Sweden by lorry?

_Uwe Will:_ They drive once across Europe but that is simply the truck drives to the vineyard is fully loaded and drives off there is nothing more in between. And then I know what else with a truck, which is not paid after Spanish tariff after German tariff somehow something like that. We can imagine bad scenarios there and from it actually a political demand comes now.

_Uwe Will:_ If I want to avoid, from a political point of view, a situation in which traffic-friendly or car-friendly or lorry-friendly towns and cities and lorries-friendly hinterland are built because there is no such thing, then it must actually be in the public interest to promote its alternatives. We are talking here about short sea shipping and inland waterway transport. Do you know that? (addressed to Mr Stemmler). There is a demand that inland waterway transport should be exempt from charges.

_Dr. Stemmler:_ This has already happened. The Rhine has always been tax-free.

_Uwe Will:_ Exactly, driving on the Rhine has always been tax-free and on the German canal network fees had to be paid for the use and also for the locks.

_Uwe Will:_ Here a fee-freedom is aimed at or now finally the fee-freedom is there. I say that more can happen. It goes without saying that there is freedom of charge, and there should actually be support for it if I can prove that I am shifting certain transports to inland waterway vessels. Then the inland navigation operator should be exempted from taxes. The inland waterway skipper should receive support because he contributes to the fact that there is no need to build any transport infrastructure. This will certainly not happen, because the demands have existed for too long.

_Uwe Will:_ We must now try to find intelligent solutions.

_Uwe Will:_ I once imagined it this way because you focus on students, who does it really concern, what actors do we have in inland navigation? There is the block of logisticians who have to carry out the chartering and organise the transport. Then there is one who offers transport. In other words, the person who has an inland waterway vessel and uses it. You have to see what type of inland waterway vessel I have, what can I put in it, is it a tanker or is it a dry cargo vessel. If I can pack containers into a ship, I can also transport feed with it, that’s not so bad, it only has to be swept out once, but there’s dry ground and you don’t need a special ship. I can use this ship to transport wind turbines or something like that. That’s all right. If I have tankers then it’s different. Then I also have the part that makes the trips possible. As a rule, this is the state part that provides the transport infrastructure, i.e. the canal network, the locks, the lock organisation. That is a very small number of people who work there. Above all, it is the hydraulic engineers who are in charge of the operation. But those who organise the transport, those who coordinate the locks, that is part of it. And then I think there is another scientific superstructure, that sounds a bit like Marxism-Leninism, but that is something like that. That would be another field of study where I would actually say let’s not just look at logisticians, but also at computer scientists or shipbuilders and mechanical engineering. Because it’s also about drives, about innovative drives.
Uwe Will: In my eyes and in my perception, inland navigation also suffers a little from the fact that it has a dusty image. Or how do you see it? Have you ever dealt with the inland waterway vessel?

Nele Albers: I have to say that before the project I did not deal with inland navigation at all. Now I find it very interesting, but especially because so much is happening in this area.

Nele Albers: That makes it interesting, of course.

Uwe Will: So I think the biggest innovation in inland navigation is actually that there is radar and IRS. That is already something great in inland navigation...

Uwe Will: An inland ship like the Gustav Königs class chugged through the area in a completely different way than such a modern ship does today. You just have to say that, something has changed. Nevertheless, many people still have this "Gustavus King" in their heads. This typical ship with a length of 65 meters, where the smoking skipper is on the back of the pipe and perhaps he has a standing on the front whose competence is that he holds the broom correctly in his hand and can also throw a line. But inland navigation has already developed insanely and if you go on such a modern inland navigation vessel today, then you notice that a lot has already been done. Nevertheless, we still need much more. Especially when you think of the canal network. The point is that the inland waterway vessel is slow, but I have to see that I can organise an optimal achievement of objectives despite slowness. So if the inland waterway vessel starts sailing now and actually pulls out two knots more and can then wait half an hour at the next lock then it won't do any good. So this timing of the locks has to be optimized.

Dr. Stemmler: But I also see this in the context of the ownership structure in the industry. That the ships often belong to the captains themselves, that is to say to the participants, and that the ships can unfortunately become very old. In maritime shipping I have the problem of corrosion and rust, and of bending stress in sea states, which are much less able to withstand structurally. But an inland waterway vessel lasts forever, about sixty years. I still have the old hull, which I can widen and extend, but it is somehow always a limitation and with regard to containers, for example, all this does not really fit. And I still have this old system, shipping perhaps sleeps with its partner or vice versa on board. And I don't have the possibility like with the locomotive to let it pass from A to B and after four hours the driver changes. And the four hours he drives the train there and then he drives back later four hours again and after eight hours is the end of the shift and he or she is back home. Unfortunately, this is not yet possible in inland navigation due to the mass. One can imagine that one tries to organize network traffic and then simply change the crew or that they do not have to sleep on board at all.

Uwe Will: Whereas this is lost space, they can't use it economically any other way.

Dr. Stemmler: But at least I can drive longer. Maritime shipping is showing me that I can work with different guard systems and thus compensate this slowness factor.

Uwe Will: Only have you ever been to the Mittelland Canal at night when it is pitch-black?

Dr. Stemmler: Not yet on the Mittellandkanal, but I have certain technique. I can also upgrade the track with radar technology and I can use night vision equipment.

Uwe Will: But I simply still think that inland navigation is reaching its limits in a certain way. I now imagine such a large ship convoy and not wonderful weather like today but wind. There is a nice video of a convoy on the Elbe side canal, the skipper travels crosswise to the water,
because he has to balance the wind. So, and now one comes along and he has to pull the ship over for a moment, or he has to see that it has to pull the ship over first, so there are some things why I'm not so sure if this works in the dark.

Uwe Will: Especially since we have a narrow territory. We have quite a lot of space in ocean shipping. We don't have that in the canal. But I haven't been busy with night cruises yet.

Dr. Stemmler: On the Weser, you can do that at night even with big ships.

[Further discussion about night trips that are irrelevant for the scope of the interview]

Dr. Stemmler: But again to the first group of actors you named, the logisticians. You also have contact with exactly this target group via your Via Bremen past. They were almost members of you. Now let's imagine a fictitious situation, you shouldn't market the port, but the whole system connected with inland navigation. What are you telling them? How do you take this up in order to address the image problem and perhaps also promise that there is a political backlog in the infrastructure, but how do you address this target group and what information do they need?

Uwe Will: With the shipper it is only one thing and that is the blank number. It is only a question of costs. The freight forwarder is not interested at all in whether his transport is transported somewhere on a rotten truck. So few people have this Green Image who say: That is my company's philosophy, I also want to be green in my company. In the end, however, he still wants at least the bill to work out compared to a less green transport. So that's my experience, we've tried several times to organize events where people said: Switch over, you can bring the container from Bremerhaven or Bremen to Hannover or to Braunschweig. It wasn't any further, Minden joined us later.

Uwe Will: But then it was always: What advantage do I have? What do I save? And then you really have to look, is every container really time-critical?

Uwe Will: It's always pretended that every container has to go down there fast. That's nonsense, if the container from Hong Kong has already been at sea for six weeks, then it doesn't matter any more that it's still one day on the way by inland waterway vessel, or two days. It really can't be that. The next one is something that shippers have also jumped at, though, when the recipient says that the inland vessel is a kind of interim storage facility for me. For example, I have just-in-time delivery to production, but do not need to keep my own warehouse, I basically store my goods on the inland vessel.

Uwe Will: If the inland vessel has a reliable schedule and I am guaranteed delivery at a time X. Because the truck rushes through and then it has to be unloaded and then the producer has to put all the stuff in storage.

Uwe Will: But with the inland waterway vessel it also has so much mass that it arrives that it really does not have to carry out large storage operations.

Uwe Will: The barge as buffer, as intermediate storage. But even there, the general conditions must be right, it must be able to maintain a reliable schedule.

Uwe Will: The timetable is, I just have to think about it, but we once had difficulties due to ice conditions and then it can happen that a ship can't get through anymore. On the Rhine there are difficulties with too much water or too little water. And in the canal network this risk is a bit minimized, because it is supplied by the rivers and kept on a level by the dam and the locks.
last year we had some problems on the Elbeseitenkanal due to a very hot summer, not so much on the Mittelweser.

*Uwe Will:* All right, the first target group is the shippers.

*Dr. Stemmler:* That means for an online learning inventory, which is what this is all about, it is not enough to just show colorful pictures, brutally speaking. You would then have to open a sample invoice, for example Bremerhaven to Hanover for the hinterland traffic to develop a sample invoice, what the cost with all transhipments in comparison with the direct truck transport.

*Uwe Will:* That’s right, I’m just thinking about your bill you wrote in Flensburg.

*Dr. Stemmler:* That’s exactly what I had in mind. That means for the competence, it is actually the bread and butter business of the logistician to calculate such alternatives. From my point of view, however, this would mean that we would have to make sure that the future decision-maker who carries out this calculation knows cost models that cover all costs. I always have the feeling that we are only talking about half the costs if we leave the external costs aside. To the detriment of inland navigation, where, for example, process costs are also calculated, it has to be said that lorries are cheaper because they drive directly and because I have only one contact, namely the carrier. I load the wine in southern France and unload it again in Sweden. But if the same forwarder says that I want to transport the thing by inland waterway, he first needs a preliminary leg from France to the winery. I say to the Rhine or to the next Intermodal Terminal to show it neutrally. That means I have to organize it, I have to order the Intermodal Terminal, I have to order the parking place on board the ship or on board the train and the same again in Sweden. That means moderate litigation costs, I am also at disadvantage if I have broken traffic somewhere.

*Uwe Will:* That’s the point, and I don’t know how to incorporate that into a curriculum. Actually only by mentioning it frequently. You have to convince the one who organizes the transport or the freight, the forwarder, to think in this direction. Unfortunately, this is also what has to be organized in day-to-day business, where several hundred containers or even a thousand tons of freight are involved every day. As you said, it is easier to rule out this very invoice. I have my contractual partner X, forwarding agent Würfel and I call them again and ask if they have two trucks free again and they then transport it. It’s more difficult with the inland waterway vessel.

*Uwe Will:* Or I have to bring my cargo from Bremen to Göttingen. Then I would drive all the way to Hanover. From Hanover, however, my delivery still has to be transported the last mile by truck.

*Uwe Will:* So I need two modes of transport, I need the inland vessel and I have to see how much offer I have here that is terribly limited. I think there is one transporter on the way.

*Uwe Will:* And then I have to see from Hannover that I book a truck that goes down to Göttingen. But I have to talk to two people. What can be an advantage is if I have to transport a whole mass of freight to this region. If now someone wants to bring not only a container to this fictitious recipient near Göttingen, but twenty then he does not need 20 trucks, but an inland vessel.

*Uwe Will:* And then he might need 20 trucks from Hanover.

*Uwe Will:* But due to the short distance they can also travel back and forth in shuttle traffic. We once had such a situation between Kassel and Baunatal for the VW factory, there we went in...
the other direction. They don't manufacture cars there, but a certain number of these eleven thousand individual parts which later result in a car and thus supply all factories also abroad with spare parts. And they always had a lot of containers going to Hong Kong or Beijing or South Africa. There a truck was used, which drove from Baunatal to Hanover and from there the materials were brought with the inland ship to Bremerhaven.

**Uwe Will:** It was worth it, but we're already back to the big stuff. And we also want to talk here about other cargoes or detached from the German canal network or even worse from the Rhine. With the Rhine, I think it's a self-runner.

**Uwe Will:** There are also many shipping companies that have their own ships.

**Dr. Lars Stemmler:** I see the Rhine uncritically except for one point. On the Rhine, 80 percent of the traffic volume is generated on 20 percent of the network, more is actually not possible at all. Logistics is not only the calculation of costs from a business point of view, it is also risk management. We have just mentioned the periods of low water. Do you think that the inclusion of risk management or the increased emphasis on risk management by students or decision-makers can approach the issue from a different perspective?

**Dr. Lars Stemmler:** So, for example, that you take the argument that I do not take inland navigation, I have too little water in the summer and I have ice drift in the winter, so I take the train right away. I give the train a big contract, it does that and I have a contact person. But if you say that the logistician is being given risk management competence with which he is able to design a plan B for the winter and perhaps for the summer, which makes it easier for him to put it on the inland waterway vessel, then perhaps that would also be a possibility.

**Uwe Will:** But what's that supposed to mean? He then has a plan for how the freight can still be transported, then by train or truck.

**Dr. Lars Stemmler:** By this I mean that the logistics solution is not only based on one pillar, but that a holistic concept is offered and inland navigation is just one part of it. On average, perhaps half the volume, but we still have to deal with competing modes of transport. It is best to calculate a complete transport concept for the entire year together. Perhaps the traditional models will not suffice, because everyone looks at their own capacity utilisation.

**Dr. Lars Stemmler:** So in the case of block trains, for example, from my point of view, you need an occupancy rate of over 90 percent, perhaps 95 percent, so that you can earn any money at all. This means that if I don't get the capacity utilization over the year and I drive maybe 100 percent in winter when the waterways are closed, but I don't know that 100% and I can't calculate that.

**Dr. Lars Stemmler:** Perhaps the possible combinations are not enough.

**Uwe Will:** But there must be at least some examples, if there are model calculations I don't know. Because the situation with floods and low water occurs regularly.

**Dr. Lars Stemmler:** But I don't know any examples, I wouldn't know that.

**Uwe Will:** I just can't imagine that with this frequency it still happens that someone says: God now we have low tide, now I must have some scenario how I can transport it differently. I can't imagine that. So those who are the carriers have certainly already developed their routines. But will it also be easy to return to inland navigation? There is sometimes a danger when they put a
bypass in place, so an inland waterway vessel can't just drive through low water or ice and I look for an alternative solution and now suddenly have a lorry contractor who transports my cargo and that works great. Then I'll continue, whether the ice has melted or not. We also want to see here that it comes back to the inland vessel. There's no question about that on the Rhine, because we did it simply for cost reasons and for economic reasons with inland waterway vessels.

_Uwe Will:_ [Example, about the transport on the Rhine]

_Uwe Will:_ But that would be an idea for a company that is a regular consignee or a regular shipper along the Rhine or an inland waterway. It doesn't necessarily have to be the Rhine, it simply has to be an inland waterway. What risk have I that my production flow will be interrupted, because even the just-in-time delivery and the early floating warehouse does not work, but I must have an alternative. And is there an alternative? Today we may also have to look at risks, we have enough locomotive drivers, we have enough lorry drivers, it always sounds so easy to switch to lorries, but there will soon be 10-15,000 lorry drivers too few here. Incidentally, there will soon be around a hundred or two hundred inland waterway skippers too few.

_Uwe Will:_ So there is also a shortage there and perhaps there will also be a change there, also towards industrial inland waterway vessels. The fact that the private sector will no longer pass the ship on to its sons and daughters.

_Uwe Will:_ That the ship will eventually be 60, 70 years old again.

_Uwe Will:_ We have to observe this change somehow and what is necessary at this point. But that is outside the universities and colleges, advertising for the profession, recruiting young talent. But with the flexibility of an inland waterway vessel, I can think of just now, also in the discussion with the Mittelweser, the roadway will be widened and the river bed deepened so that larger ships can sail, that was expected by the industry. Now that everything is ready, the big question to the industry was when is the first 110-metre ship coming from you? And then there was just, yes, we don't know yet...the tendency to change is not there as it is with a truck. The truck also has a limited service life, a much more limited service life than an inland vessel.

_Dr. Lars Stemmler:_ Everything actually happens very quickly, and the motorways are then equipped with overhead lines. There are field tests for the long truck, everything can be done within a short time.

_Uwe Will:_ But then again for me the question is, if transport policy wants us to have a shift to waterways, then this too must be supported. Not a scrapping premium, which has already happened before, but a new-build premium, a real new-build premium, a more modern ship, a bit bigger, a bit better equipped with modern facilities organized for two-man operation, then you get the premium. I think that is indispensable.

_Uwe Will:_ [...]  

_Dr. Lars Stemmler:_ But now I have to think about how I can get that into a study content, especially the innovation.

_Uwe Will:_ So apart from these normal things. That's bread and butter for the logistician. He just needs to get interested and have a look at the inland ship.
Dr. Lars Stemmler: I don't think we're getting anywhere with cost models. All we can do is burn our fingers.

Dr. Lars Stemmler: As far as risk management is concerned, yes, there is always only the question of the capacity utilisation of the respective other mode of transport that is not being used at the moment.

Dr. Lars Stemmler: And I think innovations are the most exciting. Especially with regard to the image problem, that you address the people who sit at the Starbucks during the day and actually know inland navigation only from the lake or really from the Stand Up Paddeling. That one defines oneself an inland navigation pattern breaker and completely goes away from these building blocks and soil. I mean, inland navigation has had 60 years since the war to work out reasonable transport solutions. frankly speaking.

Dr. Lars Stemmler: But if you really take a blank sheet of paper and have a look what is going on at the moment where are the founders of the company. Where is the music? It's in IT and it's with some funny solutions where you don't even think about it, like this beer boat in Utrecht, for example.

Dr. Lars Stemmler: I think this is a good example, but whether it is now scalable is another matter.

Uwe Will: Yes, that would mean, flatly speaking, taking a map and looking where there are tributaries to large inland waterways. So these tributaries, which you have just mentioned, here with us perhaps the Aller.

Uwe Will: What is it about this river? What could you put on it?

Dr. Lars Stemmler: No, I don't mean that at all. Really picking up the target group at their favourite pastime, sitting somewhere outside on the steps with the computer, sitting with the laptop or at Starbucks.

Uwe Will: Now I have not yet understood what you would like to do.

Dr. Lars Stemmler: Now I come from the corner of image problem, we have talked about risk, we have talked about cost models, I think we hardly have a chance to attack there. All we can do is burn our fingers.

Dr. Lars Stemmler: Because you always have a topic, you have the additional handling for broken traffic, then the next one comes who says, but you still have to consider the processes. Then you've taken the time problem into account, if I'm driving with a lot of traffic then I automatically hear a stock level that costs me a lot of money. Then I would also have to include opportunity costs in my cost model [...]

Dr. Lars Stemmler: I have a similar view of risk management, you can correct me there with pleasure, I always have the problem with the utilisation of the alternative mode of transport. And I always have to look into my cards as a carrier. I always need someone who does the opposite. And if there is ice, I need someone who has the capacity on the track and vice versa. That means if I drive fuel oil in winter I need someone who drives road salt in summer so anticyclical.
Dr. Lars Stemmler: The way I've gotten to know the industry so far, it's difficult for them to look into the cards, the forwarders say it's all mine! The freight exchange would be limited, but only works when they actually take over the transport service. The only thing that remains for me is that inland navigation has an image problem. In principle, I could only get my hands on innovations and that's where I think the innovation is at the moment in the coffee shops and the Starbucks.

Uwe Will: But there I have the problem, innovation is good but I need a solution. I have to take a look, where can I use something like a beer boat?

Dr. Lars Stemmler: Wherever there is city logistics, whether it's in Bremen. In Berlin I think that would be great. There are already good alternatives in Paris.

Dr. Lars Stemmler: From my point of view, the target group is not actually the logistician, but rather the crazy IT guy who is looking for alternative concepts.

Uwe Will: [Example of a failed similar experiment in Bremen]

Dr. Lars Stemmler: But for me the first thing that counts is the attempt to show that we are able to lift such transports out of the ground with little effort.

Dr. Lars Stemmler: [...]

Uwe Will: Now we've completely lost touch with your questions.

Nele Albers: That was in any case a very detailed answer to the first questions.

Nele Albers: However, you have already answered the second question, namely why inland waterway transport might not be fully exploited. Then I would be very interested to know whether you know anything about the content taught at universities. And do you think that a bremenports learning inventory that will deal with special competences will help?

Uwe Will: Yes, of course you have to make sure that people are interested in inland navigation and that it is really presented what inland navigation can do, with current examples but also what requirements are made. What can I improve in inland navigation? Drive technology LNG, instead of diesel. And of course also offer an incentive by promoting the construction of ships with LNG technology, I think electricity is nonsense.

Dr. Lars Stemmler: [...]

Nele Albers: Now we have already talked a lot about competencies, such as billing, risk management and especially innovation. Are there any other competencies that you could name? Are there competences in which you believe that students must have these in order to include inland waterway transport as a mode of transport?

Uwe Will: I don’t think that's special.

Uwe Will: Because a logistician will not even think about the construction of a truck or a train. It doesn't matter to the logistician whether the railway is operated with steam or goes anywhere with electricity, that doesn’t interest him.
**Uwe Will**: He has the prices, the times and perhaps the destinations in mind, but I can't imagine anything else.

**Uwe Will**: You're a logistician! (Addressed to Mr. Stemmler)

**Dr. Lars Stemmler**: Yeah, but we never had the subject. We also had trains and so on.

**Uwe Will**: No, but I mean the logistician wants a certain one to get away from the container now, he has a certain good and he has to bring it there from here. And there's also a river and a railway track and then he'll think about how I can best do that. There are also various general conditions, I'm going to take the heavy goods transport, because I'm a real fan of the fact that heavy goods transports that otherwise clog up the motorway, that you put them on the water. Why should a transformer block weighing 300 tons with heavy transport be transported somewhere, night after night, night after night, if I can use the waterway?

**Uwe Will**: Can I give you an example? For me, heavy transport is an issue where I say that, if it fits the dimensions, then it belongs on the inland waterway vessel, because it can drive through wonderfully quickly, provided that it can drive under the bridges for a long time. We had discussions with the Liebherr company, you may know the company, they make cranes.

**Uwe Will**: And they have really huge things, where a crane consists of up to 20 truck loads. There you have the pole and the boom here and there and the counterweight has to be transported individually and so on and so forth. Liebherr Germany has its headquarters in Memmingen. And the A7 motorway passes directly by Memmingen. They actually say to themselves that the truck can drive up to the A7 and drive north, turn off shortly before Hanover at Walsrode and then off to Bremerhaven or straight through to Hamburg. Completely wrong. The A 7 consists of many bridges, which are limited in the load capacity. The trucks are not allowed to drive there. This means that a heavy goods transport goes from Memmingen to Nuremberg, to Leipzig. But it cannot go from Leipzig to Magdeburg either. So he goes to Potsdam, drives up the A2 to Hanover and then to Hamburg, because the turn from the A 7 to the A 27 cannot withstand this heavy load.

**Uwe Will**: So he lands in Hamburg and will certainly not go to Bremen. So a huge detour, now you would have to think about what possibilities you have in the vicinity and unfortunately then it probably goes to the Rhine. But that's nonsense, that you do a heavy transport over these long distances on the road, that was just an extreme example. But there are also other examples where more and more people are trying to get onto inland waterway vessels. On the Mittellandkanal, on the Elbeseitenwegkanal and on the Rhine, of course.

**Uwe Will**: Heavy transporters should get off the road and onto the inland vessel. So to think about it and to calculate it is also part of it, is that a competence, well the ideas simply have to be there. I think it is simply much more important to show the possibilities of inland waterway vessels. Now we come to the portal, when I offer solutions there, also interesting things present, then it becomes exciting, then it becomes interesting for someone to deal with this topic. Especially when he knows I have a customer who approaches me again and again with these problems and I develop a solution for it.

**Nele Albers**: Okay, thanks. Now from the other side, then.

**Nele Albers**: Of course, I have already dealt with topics that deal with competences in advance. And it's often the case that competencies are developed for the job, that they are defined specifically for certain tasks. It is often the case that these competencies are linked to the goals.
or strategy of the entire company. Are there specific or fixed objectives that could be linked to
the inland navigation industry?

Nele Albers: Something to say that should be achieved?

Uwe Will: I honestly can't think of anything. Not now.

Nele Albers: It is simply a question of renewing inland navigation in general?

Uwe Will: It is also a question of raising awareness of inland navigation again. I think that is
simply important. I simply reflect from the many conversations I have had with freight
forwarders, whatever the occasion.

Uwe Will: And because I also simply have in mind that inland navigation would have to be used
much more than it is now. What do we have in hinterland transport? I think three percent of
Bremen's ports are inland waterways. Then there's always this, "oh no, they're slow, old-
fashioned and stuffy, and I'd rather take the fast rail or the flexible truck and get it done. But
thinking about these things hasn't happened yet. There have already been attempts to use a
special tram trailer for distribution in the city centre.

Uwe Will: Well, that's a little weird, but why not? That's what Dr. Stemmler said, i.e. supplying
stations with the bicycle courier, that's not so wrong. There was this city logistics, which by the
way is still not quite in my head, that is not yet so space taking. So I deliver with big trucks to the
GVZ, I put a big truck from Cologne in my place, it has two pallets for Karstadt. Then this 40 ton
truck doesn't have to go downtown to unload these two pallets. So he can deliver them to the
freight traffic centre, then a sprinter picks up the load and drives it to Karstadt. But somehow
that doesn't work.

Nele Albers: Even that doesn't work yet?

Uwe Will: I don't know now how Karstadt gets his merchandise. Probably with a medium-sized
truck, but this citylogistics concept, which will take place in the GVZ, hasn't got off the ground
yet. But if I now have such a hip concept as with the beer boat, it's also a firm part of me, because
I think it's so great. Maybe Bremen is the wrong city for it, because we just have this one big
river in the middle (the Weser) and then the Schlachte would be the unloading possibility.

Dr. Lars Stemmler: It's the same in Utrecht.

Uwe Will: But then everything is narrower and you are really happy if you don't have to use the
narrow streets. In Utrecht, in The Hague, in the Netherlands, I wouldn't get through with a 40
ton truck. That's just not possible and that's why you prefer to ride your bike there. That's why
I mentioned earlier that we have to have a look at the small rivers. I don't think Hamburg would
be suitable for that either, because the crossings are all much too low and pleas aren't wide
enough or don't have a proper connection at all.

Uwe Will: [...]

Dr. Lars Stemmler: In Utrecht and other Dutch cities I sometimes just see the advantage because
you can't get into the city centre with other means of transport.
**Dr. Lars Stemmler:** I see that in connection with bicycle couriers. That you have standardized containers that you can quickly reload and leave on the pontoon, on a ramp. From there every bicycle courier picks up his crate. Start small and anchor the carrier for the first time.

**Uwe Will:** At the end of the day it's not a charity, it has to pay off.

**Dr. Lars Stemmler:** Yes, but on the other hand, solar technology also started like that.

**Uwe Will:** But someone has to invest in the ship, someone has to say I drive it and I have fun with it, but I still have to feed my family and pay for the fuel. So that has to be economical.

**Uwe Will:** On the other hand, there are examples which are not economic but which fill exactly this gap.

**Dr. Lars Stemmler:** [Mr Stemmler mentions one example]

**Uwe Will:** Yeah, you know I'm the head of the Bremen Seamen's Mission, we rely on volunteers. But when I put a company on volunteer work and two volunteers jump off and I need a replacement, it's incredibly hard to keep that up.

**Dr. Lars Stemmler:** You said yourself, the Elbe canal was extended and the Mittelweser and there was simply nothing from the industry. Where are the big ships? Nothing comes. So you should just turn the tables and say: How can I start with small solutions? And don't keep falling into the same trajectory again and again and say the bends are too low and then the taxpayer pays a lot of money for the expansion and then still nothing happens.

**Uwe Will:** No no, I find that very interesting and we have already thought about a similar project. Namely, groupage transport is a very tedious business. The forwarder wants to book 20 containers in the morning and not worry about groupage. But if I have a beer boat that travels between Bremen and Hanover in a certain regularity and, for example, picks up 25 barrels of Becks at the dyke and unloads three of them in Nienburg and three of them in Hoya and then you have to see what Kellogg's products or similar products are added that are delivered there regularly. And you don't have to drive around in a DHL truck anymore. I think that's an exciting approach. Really finding out what I can shift to the Middle Weser. Are there certain goods that take exactly this route three times a week?

**Nele Albers:** Then I would like to conclude by asking you once again what your personal expectations are of future decision-makers in logistics?

**Uwe Will:** That they are guided by the idea not only of achieving the CO2 targets, but that logistics and green really have to go together!

**Uwe Will:** That covers everything for me. It's a real task, that it all goes together. If logistics is to become sustainable, it has to become green. And that's actually part of every company philosophy.

**Nele Albers:** Is there anything else you'd like to add?

**Uwe Will:** No.

**Nele Albers:** Great, thank you very much.
H.2 Interview Transcript Thomas Zink and Gunner Peterson

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<td>German Academy of Foreign Trade and Transport - Universitätsallee 18</td>
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1. **Nele Albers**: If you have any questions for me, feel free to ask me in between. In that case I would like to start with the first question. You have already received the questions before. What possibilities do you see in inland navigation in general?

2. **Gunnar Peterson**: Yeah, I’m good to go. In principle, we believe that inland waterway transport is actually a mode of transport that has been lost a bit by radar, but which also offers very good opportunities and chances in the future, especially in view of the developments in green logistics, the environmentally friendly character, there is a lot going on.

3. **Gunnar Peterson**: We all know the Rhine rail, but we know far too little about how much inland shipping happens on the Weser and what goes on the Elbe. And what happens over the canals? There is still a lot of room for improvement. Now, of course, it’s clear that I can’t build the canal as easily as I could build a road. Nevertheless, it is a mode of transport that is of tremendous importance in the entire hinterland and seaport connection, regardless of whether it is the...
northern ports or the southern ports, because it simply represents a massiness that I could not represent with any other mode of transport, apart from the railways, in any way, even to the slightest extent. I already see possibilities there, we just have to try again to bring it forward a little from the back of our minds to say quite clearly: my dear friends of industry, of logistics, where we have water we can go by ship and we have here a mode of transport that definitely has advantages.

_Gunnar Peterson:_ It certainly has disadvantages like any other mode of transport. But we have to be quite open about it.

_Gunnar Peterson:_ I therefore consider inland navigation to be a very interesting mode of transport.

_Gunnar Peterson:_ Inland navigation is particularly interesting for the loading economy in the industry for project cargo, breakbulk and mass goods.

_Gunnar Peterson:_ And the Rhine is more of a motorway.

_Nele Albers:_ Okay, thank you very much. Mr. Zink, would you like to add anything else?

_Thomas Zink:_ No, I’d always have my say.

_Nele Albers:_ You have just mentioned a few points that somewhat restrict inland waterway transport. To what extent do you integrate inland navigation as a subject into your study program?

_Gunnar Peterson:_ I can continue right now. We have integrated inland navigation as a separate module in the curriculum of the experts in freight transport logistics, with a corresponding number of lecture hours.

_Thomas Zink:_ These lessons are not taught by us, but by a practitioner who comes from inland navigation. The practitioner is a trained bargeman and comes to us twice a year for eight to ten teaching units and really only talks about inland navigation and tries to bring the carrier back on the radar for our specialists in freight transport and logistics. Because we have a very large number of participants from the south of Germany, especially in the case of the full-time students.

_Gunnar Peterson:_ That gives me the opportunity to cross the Rhine in the south. The inland vessel has been lost from the radar and with its practical experience and the relatively pragmatic approach we have integrated the topic relatively well.

_Gunnar Peterson:_ In the entire framework syllabus, compared to the other modes of transport that we have.

_Thomas Zink:_ In the case of them, one has to say that the business economists are more industry experts. So this is rather a further education for industry experts and you have to keep in mind that all of the people who go into further education with us and this is the case with the bachelor’s degree or also the business economists, all of them have previously completed an apprenticeship. We have 80 percent freight forwarders, I would say. In other words, we assume to a certain extent that they had transport carriers undergoing training, and we are seeing more and more that the prerequisites no longer apply. And since the modes of transport are, so to speak, the tools of the trade of freight forwarders, I would actually expect training to be more
aware of that. That is why we have, for example, in the case of business economists, as I said, it simply goes even deeper, here it simply goes beyond what can be expected from training.

*Gunnar Peterson:* For business economists and bachelor students that is the case. Their knowledge is usually broader, so we can simply go deeper into inland navigation because they will hopefully have come across this during their apprenticeship. Meanwhile, I would have to revise this. But we have at least touched upon inland navigation in some assignments.

*Thomas Zink:* They had the assignment to organise a transport from A to B and in this context lecturers reviewed alternatives like railway or inland navigation which is usually not essential for business economists. That may change in the future, so far we have discovered that inland navigation plays no decisive role in education.

*Nele Albers:* The railway will be the next one to share the same fate and so we have to reorient ourselves a little now.

*Nele Albers:* So most students have already done an apprenticeship before?

*Thomas Zink:* Yes, all of them. That is our entry requirement.

*Thomas Zink:* Sometimes we have shipping agents, industrial management assistants and office clerks, who obviously have no experience in inland navigation.

*Nele Albers:* You are saying that you are already involving inland navigation in general.

*Nele Albers:* But why do you believe that inland navigation is no longer taught at all at other universities as part of the logistics course? Is there a specific reason why inland navigation is such an unattractive mode of transport that it was once discarded?

*Thomas Zink:* Counter question, is a truck being taught as a mode of transport?

*Nele Albers:* I'm still trying to figure that out.

*Thomas Zink:* The suspected answer is no. And I would say that the plane is no longer being taught either. My guess is that in most logistics courses the modes of transport are not taught because they are actually seen as the tools of the trade.

*Nele Albers:* Oh, so that no mode of transport is taught anymore?

*Thomas Zink:* Yes, that is what I believe.

*Lars Stemmler:* Yes, with us it was so explicit, if I may rake in there, if one had a bearing dimensioning, then one got automatically somehow gate dimensions delivered, which fit only on the truck. Or route planning, that was all on the truck. Well, that was in the UK, there wasn’t much rail traffic anyway, they don’t know about it at all, and inland waterways neither.

*Thomas Zink:* I also believe that many courses of study are designed in the same way as tour planning. It’s about designing networks and how a single relation is driven in such a network is of course irrelevant from this abstract point of view. And yes, I also know it from my studies, if you do bearing dimensioning then maybe you just think about the gate dimension. But I also didn’t learn during my studies how many pallets I can get into a truck and why I can drive with...
different heights in the UK than in the EU. Of course, as a student I can still find out what the
difference is between a long truck and a normal one, in terms of what savings I can have.

Thomas Zink: But I don't think you actually learn what that means in terms of pallets, in terms
of additional pallet spaces, in the classical course of studies.

Nele Albers: But do you think that there would be any added value for the industry if individual
modes of transport were discussed during studies or training, or is that really secondary? Is it
more learning by doing?

Thomas Zink: It definitely has added value, I'd say so.

Thomas Zink: But what's interesting, so to speak, is the question: How can you most skillfully
bring this in and for whom is it relevant? Because now we're talking, so to speak, about how we
should design logistics courses? I think it's important to understand the tools of the trade,
because people have to work with freight forwarders, but also with freight forwarding clerks,
for whom this is totally normal and self-evident. And I always think it's important that you can
at least understand what other people take for granted. On the other hand, I often hear from
our graduates, when it comes to inland navigation issues, that the reservations are more on the
side of industry.


Thomas Zink: The company on the industry side says, when someone says we can transport it
on a ship: "Uhh, we don't know that, the only thing we read in the newspapers is low water,
then everything is standing, or high water then everything is standing and that takes a long
time". Then the trained forwarders come and say: "Yes, but for these and other reasons it would
make much more sense for their route. Can't we make you an offer?"

Thomas Zink: Well, it's ruled out relatively early. Therefore, it is rather the question whether it
would not also be necessary to teach such a thing not only in a logistics study course and the
logistics focal points, but perhaps also in a classical engineering study course. If I am already
doing logistics, please tell me how the tools of the trade work.

Gunnar Peterson: You know, one side is industry. I call it the loading economy and on the other
side we have the service provider, the common forwarder.

Gunnar Peterson: The industry ultimately wants to have concepts and logistics is the art of
moving things from A to B with relatively little effort, as easy and fast and inexpensive as
possible. The industry, on the other hand, demands that we as logisticians are able to develop
and present ever more complex concepts due to the ever more complex requirements of our
customers. That's not the big problem for the freight forwarder, because I'm reaching into all
modes of transport that are even remotely available to me. For whatever. The industry has a bit,
I agree with you, I don't want to say an aversion, but neither the inland waterway nor the
railways are really on the radar, because for a train I need a siding in my company. It's expensive,
it costs money. That might take up space. For an inland waterway vessel, I might need my own
port and if not, then at least my own jetty and somehow lifting, loading and investment
possibilities that cost money again, that I can only use to a limited extent. But we are talking
about concepts and logistics students or logistics courses, they are often designed to create a
transport concept, they create a supply / procurement concepts and so on and so forth. How
can I ultimately go into the industry and meaningfully question the concept I have just received
and also identify possible, I say, short comings.
Gunnar Peterson: If I do not have the basis, namely an understanding of the modes of transport. If I set my mindset relatively high and I don’t understand the basis, then at some point I’ll fall on my nose all by myself and I think that’s something that we need to take a little further in many areas.

Gunnar Peterson: And perhaps the industry has to adopt a different way of thinking to such an extent that people simply say: There is something else besides the truck and I don’t always have to do everything with trucks. Of course, I also have to consider which goods are to be moved. It is quite clear, but there are alternatives to trucks and they are good, they have their advantages. But they also have their disadvantages, hey, the truck isn't always green either and also has certain disadvantages.

Gunnar Peterson: And you have to try to relate that a little bit. The experts have the advantage, most of them have a forwarding education, but in the education inland waterways and railways have disappeared more and more from the radar. Is that good? No, because I can only develop concepts if I can draw on the full potential and consider all possibilities. If I limit myself to one mode of transport from the beginning and think about a concept, then I’m on fixed rails, on fixed tracks, I can’t get down from there. But I may cut down on valuable alternatives which, in an overall view, can take the concept to a completely higher level.

Gunnar Peterson: Then I can start thinking about proper logistics.

Nele Albers: Okay, thank you very much. So now the next question has already been answered. In your opinion, should additional content be covered? I'll take that as a yes.

Thomas Zink: If you want to get philosophical, you can of course simply ask the question again: Who needs to have this specific content? At what point is it simply enough to create an understanding of it, there are different modes of transport and they all have their advantages and disadvantages. On the other hand, what freight forwarders would like is for the industry or the shipping industry to say: Those are the experts, if they propose to me to use inland waterway vessels then they know why and that is why we are now getting involved. But what has happened is that the loading industry says: I don’t know if this is such a good idea. That, of course, is also a certain absurdity, because none of us, at least I, would not do it if a sanitary fitter came to me and said: That’s how we make a …. sleeve. I wouldn’t say: Do you think that’s a good decision?

Thomas Zink: But, I would say: Do it, when it stops dripping, then it’s quite good. And of course that’s something where I think it’s also difficult. But that, as I said, is more like the philosophical side. Who actually accepts whom as experts for something?

Lars Stemmler: These reservations, which you mention, Mr Peterson, can this be expressed in the area of risk management? That the freight forwarder or the concept provider not only proposes carriers to his customers, but in principle also a holistic risk concept? To put it like this: I know there is low water, there is ice drift, we can also play with the speeds. Slowly and quickly, we can combine modes of transport. I’ll put that together for you in a risk management concept. Can that be understood in this way?

Gunnar Peterson: Yes, without any problems, because I can only use the inland vessel alone if I can make use of it on a massive scale and drive back and forth between the ports. Then the barge will work perfectly if I have enough water under my keel.
Gunnar Peterson: But when I now talk about overall concepts and the German industry is not only designed for one good and that in huge quantities, but we have trillions of goods that we move. In the end, it’s the combination of modes of transport that makes the difference, and I have to be able to weigh up when to use one mode of transport. If, for example, I do not have a flood situation, I may have to switch to rail, which is part of risk management, but it is part of an overall logistics concept.

Thomas Zink: On the other hand, funny enough, of course hardly anyone from the loaded industry asks if I am now offering them a truck transport from Spain to Germany. How likely is it that there will be another strike in France. It’s probably not that small and then everyone is standing there, too, with their goods. But nobody reads that in the newspaper again, it is the truck driver on strike in France. Everybody says: Well, but if inland navigation doesn’t work in Germany then the headlines will be: the Rhine has low water, the industry supply is at a standstill, etc. I think the media are simply sending out the wrong signals. That is of course because of the way they work, but that leads to certain reservations about modes of transport.

Gunnar Peterson: Well, of course I have the geographical limitation of inland navigation by the fact that I am always dependent somewhere on the river or the canal.

Gunnar Peterson: So I don’t have this huge coverage but on long distance? Why not?

Gunnar Peterson: At least I can go by inland waterway to Basel and beyond. I travel through half of Europe by inland waterway.

Gunnar Peterson: And from there I can drive again in combination with other modes of transport. I can actually get anywhere I want to go. This is only reduced at the moment or often reduced to "I can use it to drive containers on the Rhine" and possibly steel or scrap metal or something like that. But with it I can drive on the Rhine, that’s great, between Rotterdam, Antwerp and Duisburg. And somewhere there is much more possible. Thank God we still have very good inland shipping companies in Bremen that are very active.

Gunnar Peterson: I think they can also give you some interesting details about how the business looks from the operational side.

Lars Stemmler: I’d already reached out to them, the contact was sick last week.

Gunnar Peterson: Okay, but sick means sometime soon he will be healthy again?

Gunnar Peterson: Yes, they still exist, thank God. Hopefully they will continue to exist.

Nele Albers: So on the whole it’s simply an image problem that inland navigation has to deal with from all angles?

Nele Albers: But now that we have talked so much about it, can you think of any competencies that you think logistics students need in order to reconnect with and involve inland navigation as a mode of transport, or how do you define your competencies in your studies? What do you think you have to teach logistics students?

Gunnar Peterson: In a way, we have the situation that we say that the prerequisite for entry is a completed apprenticeship or training, preferably in a logistical field. That is why we still have a little bit of the advantage at the moment that the students and business administration participants have a good overview of the modes of transport beforehand. But I believe that we
should generally go in the direction of saying, well, logistics studies should include at least a basic understanding of all modes of transport.

Gunnar Peterson: Whether it's road or rail, sea, air, inland waterways, or possibly a pipeline, that you say at least when there is no vocational training, that you say: Okay, we must have a certain basic understanding of at least the modes of transport we can then saddle up on. I cannot develop a concept if I lack the basic knowledge. That is relatively simple. And in vocational training, which would be another step earlier, I believe is also very much up to the industry to say: my dear ones, all modes of transport must be treated equally within vocational training, we cannot just put a huge focus on the truck sector, we must also look at what is happening on the other national modes of transport that can be used, i.e. rail and inland waterways, and perhaps a little more lobbying work needs to be done.

Nele Albers: Do you have, for the courses you mentioned earlier, if someone from practice comes to teach your students, do they have a correct learning concept and certain learning goals? What students need to be able to do after eight to ten hours?

Gunnar Peterson: We have clearly defined that such contents as different types of ships, possible uses, a little basic understanding of the waterways, advantages and disadvantages of the mode of transport, possible uses, that they are also there. And that must also be covered. So it is not enough for me to know where the ship is in front and behind.

Nele Albers: Well, thank you very much. You have already answered question seven. While I have now done some research, it is often the case that competences are linked to specific occupations and that this results in a competence model. But this is also often linked to the strategy and mission, vision of the company. In this sense, what do you see as the objectives of inland navigation or what could be transferred to the inland navigation industry in general rather than the strategy of a company?

Thomas Zink: I didn't quite understand the question.

Nele Albers: It is often the case that you define certain competencies for a certain job, that's what you have to be able to do in order to exercise a profession and now it's more and more important that those competencies are already linked to the big picture, not only to the profession but also to the strategy of the company.

Thomas Zink: So in a sense, if we are a start-up company, then I need people who are flexible, who are fast, I am, a little exaggerating now, an established company, then will need people who can manage.

Nele Albers: Exactly and whether this could also be transferred to inland navigation? Of course, this is not a single company, but rather an industry.

Thomas Zink: I think that at this point I actually understand the question, too. At this point, I believe, it is less about occupations or it should actually be less about occupation-specific competences, because in the end, let me say, it is clear that if I now switch from a railway company to an inland waterway company, then of course I should understand the mode of transport, but the underlying competence to somehow be able to set up a network or to advise transport or shippers is identical.

Thomas Zink: And I think it is more about knowledge than competence. Inland waterway transport itself, so to say the objective and mission of inland waterway transportation should
rather be, from this... They have such an image, and that is not justified. But they do have such
an image, indeed that is slow inland waterway transport. All this is always the same and if I really
want to make a difference and have some lively thoughts, then I go to air freight but not to
inland waterway shipping. In my opinion they have to work on getting away from it. But I don't
make the barge faster, nor does it look any different, nor do I load more ores, but because I
might transport new cargo. But I can still offer intelligent transport solutions.

*Lars Stemmler:* I'd like to ask you a provocative question. Every transport industry or every mode
of transport has some kind of freaks and I do not mean that in a negative way. For example, the
ocean-going ships, Timber Coast Cargo Under Sail, that’s an old one and a half master who sails
coffee and rum from the Caribbean to Germany. So with the vision I say..., bicycle couriers is
now a topic which has come out of the vision stage. Also in inland navigation there are some
crazy people, in the Netherlands there is for example a beer boat in Utrecht. This was initiated
by the municipality. They deliver drinks along the gastronomy in one of the central districts of
Utrecht. What do you think about using such a railway? The key word was writing utensils. I try
to dust off this image problem by thinking completely in a different direction. You can see that
it works, that it gets through to the student?

*Thomas Zink:* At least you would have a certain publicity to get back on the radar at all. There
are two levels of these problems.

*Thomas Zink:* The first is to get attention at all and then also to hold the attention over a longer
period of time, so to speak. The question is, how do I manage to do this permanently?

*Thomas Zink:* Well, if I imagine that we would be here, our students always have fireplace
evenings where interesting lecturers are invited, and if you would invite these beer boat people,
for example, that would certainly be exciting. But then you would have to, of course, again have
a lot of control on the part of a study director, then also say in the context of a study course: I
have such an attention-getter here and now the question is how to continue this, which lectures
then conclude that I come from the beer boat to a case study, where then, what do I know, ores
or steel are transported....

*Thomas Zink:* What often reduces reservations is to have seen something. Now, of course, it's
hard to say that all companies invite all logistics students, because then they have to hire
somebody who does nothing but tours.

*Thomas Zink:* A lot of companies are just reducing that again, because they say, when the daily
routines don't run like that anymore...But I think there's a lot in it.

*Thomas Zink:* In this respect, it would perhaps make sense, I am just thinking loudly about it
now, that it would perhaps actually make sense to also set certain thematic priorities at certain
logistics courses or in certain logistics studies.

*Thomas Zink:* Let me say that this topic of Bachelor conversion and the topic of accreditation has
led to the fact that the study programmes are all supposed to be comparable somehow and that
I can only recognise focal points somehow with difficulty now. There are a few clear focal points
that have grown over time, and students in Dortmund are very technically oriented, and that's
good and healthy.

*Thomas Zink:* And you just have to ask yourself whether you don't simply set other priorities at
other universities.
Thomas Zink: There could well be a logistics course of studies that is very transport-oriented.

Thomas Zink: But if all modes of transport have a dusty image, then nobody wants to go there.

Thomas Zink: Insofar it’s going around in circles, but that would actually be a sensible objective, instead of trying to make everyone do everything.

Gunnar Peterson: A degree of differentiation is certainly useful.

Thomas Zink: To have a certain handful of people who are experts and not just "Everyone does everything". I studied industrial engineering and I still think that's a smart course of studies. But I'm very afraid that everyone will study industrial engineering. Because I can read a design drawing, but I wouldn't drive over a bridge I designed. I would also have someone who knows about it read about every balance sheet.

Thomas Zink: I know that, too. But if I now try to bring in all courses of study, so to speak, in all engineering courses of study, still economics, that does not have to be at all. I am quite happy when there are such a bunch of experts and maybe a few who can talk to everyone.

Thomas Zink: At the moment, in my opinion, much has moved in the direction of all should be general, should be broadly based but experts, I think, have a great value. But that is philosophy again.

Nele Albers: But it's true! What, of course, is very interesting form me now, apart from inland navigation itself, because you have a lot to do with students, is how best to convey competences in learning materials. We talk a lot about this media library, and of course there is also the question of how this should be taught at all. Do you have any tips and tricks on how to do this or what has proven to be very effective for you?

Thomas Zink: So perhaps it is actually this mixture of case studies that students are working on themselves. Here we work with the practitioners, but of course there are some like our inland waterway lecturers, where the main thing is to introduce a mode of transport and to show borders. He just has the focus on this mode of transport. And now we have a lecture, Tender Management. It's all about tenders from companies. The students receive a call for tenders from industry from an industrial company and have to offer a transport concept, so to speak.

Gunnar Peterson: And they need to create a customer presentation based on that tender. With this in mind, they now have to convince the customer of the concept they want to offer for this type of traffic and how they want to control it. That's the point, because not everyone sees such a tender every day. And when you get a 40 page tender on your desk for the first time, you feel like running away. You have to deal with that and that's a bit, I say, hardcore. Many people want to run away first but you don't have to do it alone, you do it in a team, in a group and then you use each other's strengths and weaknesses accordingly.

Thomas Zink: That's what this is about. So the students have to work out a concept and then present it. This is the mixture of teaching the basics, application and even if our students don't like it very much, we simply work a lot to learn from their mistakes. Perhaps we also have a comparatively rigid grading policy here. We have always had discussions about why this is a three and not a one, and we would actually like to... and have put so much effort into it. We put in a little time for mentoring, so that we then say that it is not just about the effort but also about the result.
Thomas Zink: And in this regard, I think that what we are getting back, where the students can learn a lot, that is to say work very hard on their competences, is something that can be applied. And what we have been adding for two years now are actually these fireside evenings, where speakers are invited and where companies also present exciting projects. When a company now says: We have a heavy lift company and heavy lift carriers with whom we have a lot of contact. When they move an 800-year-old oak tree or transport a church or simply a large rotor blade and introduce it to the students and then say we have an interesting project here, let’s introduce it. To make people realize that there is a mode of transport or a branch or an area, heavy lift has an image like that, not everyone knows if they want to get in there, but then I find out what they have to do. And that they actually think that this is not just a police order and somehow calculate axle load. There is a bit more to it.

Gunnar Peterson: I think what also is put into play here is that we take a relatively pragmatic approach at all. Because we try to use a lot of practitioners as lecturers. This means that they approach the problems with a corresponding pragmatic approach, i.e. as it happens every day and they always have a story to add no matter what topic comes up.

Gunnar Peterson: This is a story from your own life or a story that a colleague has experienced.

Gunnar Peterson: But it's always a story that you can get to grips with relatively quickly and where you can also record the information very quickly. That's not a mere theory, it's really gone down the wrong road somewhere.

Thomas Zink: Now the question is, why did that go so wrong back then? What should you have done differently? This is one of those pragmatic approaches and the second is that we enable our students to do things such as visit trade fairs. There is the transport logistics in Munich, like breakbulk visits and such things, where we simply say, okay, we give some of you the opportunity to go there, not to chill and have a cool time, but in principle you also get a certain assignment. So try to find out what are the latest developments in warehouse automation for example. What happens in the area of bulky goods logistics and so on and so forth.

Gunnar Peterson: All this in combination with the traditional possibilities like lecture script, like library, like online literature.

Gunnar Peterson: I think that lets our people go out afterwards with the tools, the toolbox, which is pretty well filled and they always have the opportunity to fall back on it. And whether it's inland navigation or not, a bit of theory is always part of it and a corresponding library is also part of it.

Thomas Zink: An important aspect is to use these practitioners. They talk about their daily work, so you can imagine a little more and know what to expect. And the other thing I think is important is that you just get to know cool guys.

Thomas Zink: When I tell someone: Have you thought about applying to an inland shipping company? Then it's the first thing they think of, a shipping cap and a whistle. That's the first thing they think of and then maybe the next, almost progressive step is, I think of an old man with a golden jacket. And then it stops already. If I think of our lecturer now, he's more like in his late 30s or early 40s. I think it's totally fine when he tells them that, it's cool and you can do something about it. He says it's all not boring. And finally you tell me you only use the truck and mine is supposed to be boring? And what do you do differently from us? Only your problems look a bit different, what is ramp ice with you is port with me..., what is strike with you is low water with me. Why should mine be somehow more boring now? I think that's something you
can confront students with well. If you think about a topic like the media library, I think I would actually work very hard with project reports and ideally films.

_Thomas Zink:_ And also make sure that I have guys that you can identify with. So I also like to listen to a 60-year-old bargeman and listen to what he says. But if you take a look at what I can think of now, there's this children's show, the sequel to the popular „Sendung mit der Maus“, and explanatory videos and so on, and then there's, I think, to remember, „Willi will's wissen“ – Willi wants to know. An episode with inland navigation and he also goes on an inland vessel. That is actually also quite interesting and exciting. So I found it totally well prepared for children but in the end you get to know the bargeman who lives together with his wife on this boat and who have a bicycle on the roof. This may be exciting for children, but not for the young logistician.

_Nele Albers:_ For the young logistician, however, this is very probably not the case.

_Thomas Zink:_ Exactly, for the logistician it's kind of like mhm. And now I have our lecturer. Now he has the advantage that he is Dutch. That means he always has fancy shoes and a fancy suit. But that's the exact opposite of what you imagine. And that's what they'll be used for afterwards. I always think they don't look at a truck driver when they want to start with a truck forwarding company.

_Lars Stemmler:_ But that's how it gets across. If you say port in Germany, 91 percent of people say Hamburg and Hans Albers.

_Thomas Zink:_ Yes exactly and that's precisely the same.

_Thomas Zink:_ That's exactly what the dilemma is. It would be exciting to see how big the variety of goods is that is transported. Many entrepreneurs share the same dilemma, but you don't get to know that much.

_Thomas Zink:_ If I now look where an engineering student would like to go later, then Daimler, VW, Tralala comes first. Nobody says Pampers. But someone also has to think about how diapers are constructed. Try to sell it to an engineering student. But just as much power flows into it, almost more.

_Thomas Zink:_ But I think you also have to tell the students much more clearly and precisely than before that the world is colourful. And it's all fun in itself.

_Thomas Zink:_ The answer is, in a media library it would certainly be exciting. On the one hand to contribute project reports and on the other hand to get to know everyday life and interesting people. I also believe that it would be good to have actual assignments, i.e. fictitious assignments that can be given to professors or lecturers, who then simply work on the topic with students within the framework of group work. I think that would be really good. The freight forwarder is asked to provide inland waterway transport from A to B and to go through what is actually happening in reality.

_Gunnar Peterson:_ Siemens says we're building a power plant in Vietnam, so we need a freight forwarder. Then I come as a forwarder and have to think about what has to go where and in what time.

_Thomas Zink:_ What must go where in what time, where can I take my time, where must it go quickly?
Thomas Zink: I don't always have to be fast everywhere. Sometimes it's totally fine if it takes a little while. It's just this complexity that would be nice if it could show up somewhere.

Gunnar Peterson: So the thing with the case studies, whether it's theoretical or real life, I think, is pretty important to create a certain awareness and really understand where are the complexities, where are the possibilities I can use there, because, as you just said right now, when a Siemens calls, it doesn't necessarily mean that everything has to go somewhere at once. Then I could also beam, that would be the same, but such a plant partly builds up over years. So I have to have a concept, I have to make a plan. And then it's the same, what has to run faster, what can run slower. What can I not push over road or rail? Where are the restrictions and so on and so forth? So far about case studies. That can also be something quite profane. How do you move 2500 tonnes of cellulose from Brake to Fulda?

Gunnar Peterson: 2500 tons, try to do that with the truck. That's a bit of a thing. Then they say, 28 liters of diesel per 100km Brake Fulda, mhm, how do I get it with inland vessels or with the train and so on.

Gunnar Peterson: These are some hard nuts to crack in the first, second semester.

Nele Albers: I find that very interesting.

Nele Albers: Then just finally, what are your personal expectations of logistics students and the decision makers of tomorrow, not necessarily as students, but what do they, in your eyes, have to do for the industry in the future?

Thomas Zink: I'll start. So my expectation of decision makers is that they have a certain enthusiasm for what they are doing and are aware of the wider implications of their actions. I also expect identification with the company and the industry when I go somewhere. I find that very important and the other thing is that I expect critical questioning.

Thomas Zink: If I may now and perhaps that closes the circle a little on the subject of inland navigation, if I now have a task, I tell a student, we have this Siemens power plant or this cellulose, how do you transport it, how do you do it? The question is often, how do you transport them, by truck, by ship, by plane, by train? Then the students often say that they would transport it with a truck. And I would expect a decision-maker to say: I could transport them by truck, then .... I could transport them by ship, then ..... I could transport them by rail, then.... . That doesn't take so long. But once I've got this overview I can make a decision based on it, a sensible one!

Thomas Zink: Another point is, I don't know, I'll do that and then I'll argue it out somehow. And that's something that plays a big role for us. What we are now also noticing is that students are increasingly going in this direction, we are doing it with the truck because..., and we are just beginning to counteract that. That is also a kind of feedback. We had a case study where one company bought another company and there was a detailed question, the companies were about the same size, where is the new corporate headquarters going? Do we take the head office from company A, do we take the head office from company B or do we make a new one? The students mostly answered, we do A because..., we do B because... or C because.... Our expectations would have been, for A speaks this and this and that, for B speaks that and on that I base my decision. I miss that a bit. That would have been my expectation of decision makers to get a picture and then make a decision and not say I make a decision and then let's have a look. I also have to do it sometimes, but the expectation would be to actually do it differently or just be quick to compare things.
Gunnar Peterson: I think you could even extend that a little if you were to say: it would also be expected that those responsible would step out of this area of well-being from time to time and say, okay, this is a cool idea that has now been presented to me.

Gunnar Peterson: I’m willing to invest some time and brain mass and to deal with this topic, to go new ways, to listen to what someone who doesn’t wear my glasses says. And to want to leave ways, which one perhaps took over from the predecessor. At least to think about it. To say, I leave my feel-good area and I look whether there is somewhere unknown country which I can use for the well-being of the enterprise, my job, my own Feelgood situation in the job. To be open for new things and to listen to them and to question them critically.

Gunnar Peterson: What options do I have? Why do I have to do it the way I’ve always done it? Are new ways good? If so, why? If not, why not? And what can I do to make them good? "Thinking outside the box" is what I call it.

Thomas Zink: I’m sure it would be good, too. Now let’s get back to what I said earlier, namely that decision-makers simply recognise and accept expertise at times. It is good and sensible for me to say that I am questioning something. But then I should also know that I am not the expert in certain areas. I can still ask a question, because I’m not an expert, so I can leave this journey.

Thomas Zink: But if someone then explains to me so and so and so, it would be good if I also accept it so. That doesn’t mean that I’ll leave it cast in stone. But there are simply people who know better in certain areas or are better at it or something else. That’s just the way it is. Maybe that’s really an advantage for our students, also that they all did an apprenticeship. They also know what value it has if someone is familiar with the processes. That doesn’t go down so well, that which was still very common at least in my study time, somehow in the late 90s, that one said: Well, people who did an apprenticeship, what do they know? A lot more than me! But just in another area and the knowledge I also need to develop a concept.

Thomas Zink: The company may go bankrupt because I do a lot of air freight. But I’m not aware that all this doesn’t really work because my studies didn’t show me any other options.

Nele Albers: Okay, thank you very much. Is there anything else I haven’t asked you, but you would like to tell me? Thank you very much.
H.3 Interview Transcript Cyril Alias

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| Work experience          | - Research Assistant at the University of Duisburg-Essen, Centre of Logistics and Traffic  
- Researcher at the University of Duisburg-Essen, Centre of Logistics and Traffic  
- Department Head at the Development Centre for Shipping Technology and Transport Systems (DST) |

1. Brief welcome and introduction to the topic and objectives of the research. In addition, Mr. Alias reported on one of his projects, which he is currently working on and which is also related to inland navigation.

2. Nele Albers: Thank you for taking your time.

3. Cyril Alias: As I said that is no problem.

4. Nele Albers: One question before we start the interview, am I allowed to record the interview, because I am going to transcribe the interview in the end? Would that be okay with you?

5. Cyril Alias: Yes, of course.

6. Nele Albers: Great, thank you. Would you like to receive the transcript to approve it?
Nele Sophie Albers 352753

Cyril Alias: Yes that would be nice.

Cyril Alias: [...] The quality of the phone call might not be that good.

Nele Albers: Before we start I would first like to introduce you to the project I am working on. Surely Mr. Stemmler had already informed you about this.

Cyril Alias: Yes exactly.

Nele Albers: The aim is to identify the skills gap between the content taught at universities, within the framework of logistics studies and the expectations of the inland navigation industry. The research is conducted in order to develop learning material that would then be made available on a so-called e-learning portal by bremenports, in the hope that future decision-makers will consider inland navigation as a mode of transport again, as a result of these missing competences or possibly missing ones. For students to regain awareness of the mode of transport.

Nele Albers: Now that you come from a very interesting industry, I would like to know if you would like to tell me something about your project. That sounds very exciting.

Cyril Alias: Yes, I can do that in a nutshell. I have to start a little earlier. In 2010 a colleague here in the house [...] Nele Albers: I would like to start now with my questions. If you have any questions in between, just let me know. So first of all, of course, since you also deal a lot with the industry, what possibilities do you see in inland navigation?

Cyril Alias: I have a question about what exactly is meant by possibilities? So, to what extent “possibilities”? Nele Albers: What asset would this industry gain if inland waterway transportation would be used to a greater extend?

Cyril Alias: Primarily I would say the utilization, I have, I believe, different views. As a citizen, I would say, the traffic load on roads and railways, I am repeating myself now, regarding my lecture the day before yesterday (Duisburg 10.04.2019 Conference). I am aware that you don’t have to be a transport expert or have studied anything in the field to know that we really have big problems. I know that there are similar infrastructure problems in Bremen as in North Rhine-Westphalia. We have three bridges over the Rhine, where I have exaggeratedly said that we can actually bet on when they will no longer be usable. I don’t know if we go as far as in Italy that it collapses but we are already in a critical condition.

Cyril Alias: At the same time the traffic volume and the economic volume are growing, especially opposed to the developments [... of the competitors].

Cyril Alias: In other words, we have more and more traffic, so there are opportunities to provide transport, and inland waterway transport would offer itself as a capacity to absorb these new, increased volumes, and on the other hand to relieve existing volumes. Because it is precisely the existing infrastructure that cannot actually cope with this volume.
On the other hand, there is of course another ecological factor, which I don’t want to overestimate because it’s not being paid much attention to in the market. So of course, it’s nice that inland navigation is so green, but I’m not sure whether it’s really relevant for decision-making. So the logistician who wants to send things primarily acts according to two aspects, the service level, the quality of the service and the costs. So, and as long as ecological burdens are not fed into the costs, I don’t feel these costs and therefore they are not relevant for the decision.

Of course, my marketing department will say yes you should market "go green" or something like that if it helps, but the actual decision, it doesn’t often have anything to do with environmental considerations. I would like to see a shipper who is willing to pay considerably more to be environmentally aware.

Especially since you have to understand that this is not public shaming of companies. Margins are infinitesimally low, there is very tough competition in all areas of the transport industry. There is no room for manoeuvre, even if I am more expensive than my colleagues, I am simply not booked. That is unfortunately the case, and I believe that applies to all transport service providers with all modes of transport. To that extent, I believe that this is out of the question, not least because, we have optimised the system a bit to death. We are so far away from any room for manoeuvre that we can no longer take such decisions. Because they threaten our very existence. And that has a lot to do with the federations and, in the end, also with the end consumers, if I order something from Zalando, then I want it as soon as possible, preferably yesterday, and if possible for free and I want to be able to send everything back for free.

Yeah, and I wouldn’t book it myself. I wouldn’t order anything if I had to pay 10€ for it. I buy ten pair of shoes now, and I want to send nine back, because it doesn’t burden me, it doesn’t cost me anything. That’s something else, if every pair of shoes, every shipment would cost me something and even if it were only a symbolic value, I would think again.

Yes, that’s true, of course. You are right.

Yes, and you can also compare that with the B2B world. There, too, some burdens are not priced in and that is, I think, the reason why it doesn’t work well. And then back to the question, of course inland navigation offers enormous possibilities if it meets the quality requirements that exist today, I talked yesterday about the goods structure effect, if just such shipments as Zalando or Amazon.de that are sent, could one day run on inland vessels.

For me this is an insane vision, but the direction of thinking is still not wrong. The fact that we only transport bulk goods and every now and then 10% containers, I don’t think that does justice to the incredible possibilities of inland navigation and at the same time we have the energy change and such topics, also still a decrease of the classical goods, which are transported with inland navigation. We will no longer need so much coal because coal-fired power stations will be abolished. Who, then, is to use inland waterway vessels? Then it can only be container transport or [raw materials] only if the time requirements allow it.

But, as I said, we have mutual time requirements, the intervals are getting shorter and shorter and the frequencies higher and higher. Now there is a possibility that has not often been seen yet, predictive analytics, which can play a role, or generally optimized forecasting. If I can give more precise forecasts of what I will need and can rely on it, then I have a certain
planning certainty and if I have this planning certainty, then I can use and select my modes of transport in such a way that I can reach my goal. So if I know that next Friday I will have to deliver three containers of something to a certain location, then perhaps I can also use the inland waterway vessel. But if I don't know until next Thursday, the inland waterway vessel will of course fall out. Forecasting, and with it technological progress, can also benefit inland waterway transport. It can...

*Nele Albers:* That's a very interesting point I haven't even thought about yet.

*Cyril Alias:* For many it is today like that, one is called, surprised so to speak, and then one tries to organize fast a truck and then one drives off. That can only work because the truck can deliver it, I have no chance of reaching this speed range with the inland waterway vessel. These are slow but heavy transports, and I know exactly when I have a just-in-time delivery in a coal-fired power station or at the blast furnace that production must not be torn down under any circumstances, because that would really be expensive. But I already know today that if I leave today I can unload the goods at my destination in three weeks or within the next three weeks and the goods will then be used for the blast furnace. That provides planning security, because it is so continuous.

*Cyril Alias:* In respect of other topics I need the planning security differently, but if I have that, I have a goal that I must achieve and I know this very early, then I can also take the inland vessel. That even has an advantage from an capitalistic point of view, it is ultimately rolling capital that does not burden me in my storage costs. So it also has a financial effect.

*Nele Albers:* Now you have already addressed some aspects of it. But if you had to name it clearly now, why do you think that inland waterway transport has not been used in this way up to now, even though it has advantages?

*Cyril Alias:* It's being used, I would differentiate. For tanker transport, for industry [...] inland waterway transport is vital. You can see from what happened last year when we had a great summer here as citizens but had a catastrophic summer for logisticians because the rivers had water levels that were very critical, and the supply chains were interrupted as a result. You have certainly seen what big chemical companies from Ludwigshafen were forced to get over for this year's profit reporting. That was just under a quarter less than usual, that is 25% losses.

*Nele Albers:* That was really incredible.

*Cyril Alias:* That was dramatic, and you can talk by the turmoil that is now raging in the industry, that everyone is afraid and asks themselves, oh God, what are we actually going to do if something like this happens again, perhaps even this year? And these topics are now being strongly dragged and pulled, there is extreme demand because people are afraid that this will happen again. I mean, it doesn't have to happen again this year, but it's clear that only the American President denies climate change, which will happen more often in the near future. The extremes of floods and low tide will happen more frequently. So, how do we deal with such extremes? Are our ships actually designed for this? Are our logistics chains designed with this in mind? These are issues that worry one.

*Cyril Alias:* Perhaps there are mistakes or perhaps gaps that we as inland navigation must definitely close, otherwise we will not be competitive. Otherwise, perhaps there is a second
issue, the issue of competences, which is what we have started today. The next questions will
certainly provide the framework itself, but it is certainly the case that inland navigation is not on
the radar of decision-makers, and I would really endorse that.

*Cyril Alias:* I know that from my old jobs, I know that from the companies I used to work for,
there was almost no inland navigation. Think of a large corporation like DHL, think of an inland
navigation fleet, they actually have everything but not everything! I've even seen camels in
Arabia with DHL banners around their humps without a joke. In Southeast Asia there are small
boats that operate as small cargo boats for DHL, the company is already innovative and yet there
is no inland navigation fleet.

*Cyril Alias:* This is undoubtedly due to the economic framework conditions, the system
advantages of inland navigation are often not relevant for a large part of the consignments. So,
I often do not have these large bulk goods transports, but I have many small piece goods
transports which I have to take to many different places and if I am not in Amsterdam, Stockholm
or Venice, then the waterway is not there either. At least not to the extent that you can reach
coverage or supply level, and that makes it a problem. A second problem is certainly the issue
of handling technology. One could imagine that I have just spoken about planning security and
in such a way that part of hinterland traffic is covered by waterways and then the very last mile
could be covered with fast, efficient and [...] and above all low-cost transhipment procedures,
in the literal sense the very last mile, then with trucks and smaller vehicles. However, a certain
awareness must be created, the infrastructure must create it and there must be favourable
framework conditions. Today there are already various projects by companies and research
consortia dealing with the topic of inner-city supply/logistics without the involvement of road
traffic, but they must first develop and certainly also be supported, and they must also prove
that they are economically viable.

*Cyril Alias:* So yes, these are the reasons why inland navigation could be expanded. Many, I think,
are not at all aware of the possibilities, because intuitively I would of course say that I am of
course more flexible with trucks, which I can drive anywhere. It is true that if I make a clean
analysis, I do not need this flexibility at all in 80-90% of cases. But what happens if something
changes now, I can still react with the truck, with the inland waterway vessel because it is in
some way track-bound, the river just flows where it flows for a long time, then I am bound to it.
Flexibility is more difficult then. And I believe that this is a psychological effect that makes lorries
appear much more attractive, whether or not I really need it is a completely different story.

*Cyril Alias:* I am sure that such flexibility is not necessary for a large part of the transports.

*Nele Albers:* Okay, thanks. I find it very interesting that you also brought in the psychological
effect. Of course, much is said about the image problem of inland navigation, but this is certainly
based in part on the understanding that trucks are more flexible.

*Cyril Alias:* Yes, of course. I mean, you can imagine it like this, we are perhaps tending towards
that in aviation or sometimes you have the feeling that in some phase’s aviation is on the way
to eternal demonization and then again it is quite okay if you pay 2€ Co² tax. Then you can treat
yourself to a flight to Australia. So, you understand, it is sometimes a bit equivalent in the public
opinion, but this is a nice example. Imagine that road traffic, I’m talking about freight traffic now,
is a social taboo. They would have the image of a [...] transport, then many would consider

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whether they would do this despite all the system advantages. So, factor psychology. Imagine it would be totally en vogue to be on the move with inland navigation, even if it were ecologically questionable and economically unsustainable, people would still use it. So of course image plays a big role, it is not the case that people act rationally, but they have other needs than just profit optimisation. In this respect, that would already be possible. Of course, image cultivation and image improvement is an essential topic, only if image, for example, depends on you being able to react quickly, that you are flexible, dynamic, the inland ship is not exactly the symbol for that. Inland navigation stands more for stability, for reliability, a little for decent values. That may be harder to get across in this fast-moving world.

_Nele Albers:_ Then of course a I’m dying to get an answer, because it covers the core of the project and because you have a lot to do with training. Could you come up with competences that you think would help modes of transport (future decision-makers in logistics), but especially in relation to inland navigation? I know that this question is very difficult to answer, but perhaps you can think of something.

_Cyril Alias:_ So it would be nice if one learned to use the advantages of inland navigation at an early stage, i.e. if one learned to plan in this way, that of course also depends on the data, that is clear to me and also on the dynamic of orders that I can expect. So, but here I would say that one can get a certain degree of control over this, so that one would then be in a position through this early planning and early knowledge of the plan of the orders or the transport service to be derived, that one could then make concrete use of inland navigation. I don’t know whether it will come across, but I plan so well that I know early on what I have to deliver where and when, and with this planning I can take advantage of the inland waterway vessel. I really do believe that the technology and the quality of data, which should be available in a supply chain, can help. But I have rarely seen initiative in this area, neither in education, nor in technological development. The combination of, I say, data analysis and then the use of inland navigation offers an economically and ecologically sensible alternative.

_Cyril Alias:_ That would be a competence that I would like to see more clearly. The second issue, as I have perhaps already mentioned, is loading and transhipment. There is always reference to ports and then there is always the sentence about the major problems, waiting times and I do not know what. Also the lower priority given by the terminal operators to inland waterway vessels at the port or in the port. That, of course, makes the whole thing unattractive. If I had other concepts now, that loading would not become such a big obstacle, I think it would help. That would also be a competence to develop less infrastructure-intensive loading options, transhipment options and transhipment techniques and to demonstrate that transport cost calculation and transport cost planning do not always have to follow the classic model. That there are always new technologies on the basis of hardware innovations that should also be looked at. I would consider that to be sensible.

_Cyril Alias:_ I don’t know if you went to the cargo handling workshop the day before yesterday? I think Mr Stemmler was there.

_Nele Albers:_ Yes exactly, Mr. Stemmler was still there.
Cyril Alias: It makes sense to look at different new ways. So that would be two competences that come to my mind so spontaneously. If you give me one more week, I’ll certainly think of a few more.

Nele Albers: I’d be happy to give you the week.

Cyril Alias: Those would be the competences I would spontaneously come up with. Perhaps to summarise it in one sentence, because both points aim at it.

Nele Albers: You have already helped me a lot with this and your statement fits well into the framework and I am of course very happy if you have any ideas. Now again more general, do you think it makes sense to voluntarily promote training or further education via an e-learning portal?

Cyril Alias: Yeah, it can make sense. Only if this e-learning portal stands for itself does it live from the fact that the students or interested parties develop this interest on their own or are sensitised to it by their employers. Both are difficult, I think. So why should I worry today, let’s say I’m on the road with a large European logistics company and am involved in sea shipping or air freight. Why, in God’s name, should I be dealing with inland navigation? What sense is that supposed to make?

Cyril Alias: It would have to be different if I were to learn logistics from the ground up and get to know inland navigation as an equivalent mode of transport, that would make the most sense. That you just say, there is just a lot aimed at the road, most of all. As far as the mathematical models are concerned, as a rule they all refer to the roads. Well, then there’s usually a bit of abstraction, then there’s an operation and [...] problem with track occupancy for rail freight at some point and once in a blue moon there’s something about stowage planning or something that happens at the port or at the airport and that’s it. This is the classic training in three sentences. And to look at cases where inland navigation plays a role and where you can get out with the quintessence, look here, inland navigation has been the most attractive means of transport or the second most attractive means of transport. There is a case distinction but at least it is not directly excluded. This is often the case, the introductory slide mentions the advantages of the system, it is cost-efficient and low in emissions, but it is slow, but it is actually already out. So we have called inland navigation pro forma. Inland navigation has been mentioned, but in the further development of solutions it no longer plays a role.

Cyril Alias: I know from my own experience that I have only learned seaport transhipment and rail and road transhipment as combined transport transhipments. So barges, yes there is a crane, it takes something from the barges and then it goes again to the right logistics. That’s how it happened, and with today’s knowledge, I can subscribe to your hypothesis that [is a bit dependent on it].

Cyril Alias: I see it that way. Maybe that has something to do with where I work now. But of course you can get more out of it. We will never replace the drone or Amazon’s aircraft fleet. But there are niches in which inland navigation could play a very serious role if the infrastructure were expanded and the framework conditions adapted accordingly.

Nele Albers: Then I would like to ask you again something about competences in general. While I have now dealt a lot with competences, I have noticed that many competences are rather
tailored to a profession and not to an industry. At the same time, one tries to link the competencies with the strategic goals of a company. What would you say are the strategic goals of the inland navigation industry?

Cyril Alias: Well, I can see the strategic goals now. Going for green alone won’t do you any good. This factor reaches a clientele that does not necessarily occupy the position of a decision-maker in logistics or the shipped economy. Of course, when I walk along the Rhine the ships are quite nice, there is a certain flair in Cologne and Duisburg. The Rhine navigation passing by is quite nice. If I live there and I have two small children, then I find it a little less interesting because of the emissions. If I’m a manager now and then go to the office on Mondays, I don’t find it interesting any more. It’s nice that everything is supposed to be so green, but that has nothing to do with the goals I set for my career. Green isn’t that important now, it’s about costs I have to save and customer satisfaction. There are goals I have to achieve in my company and if there is no green in it I am not interested. In this respect, I don’t see the green alone as relevant to decision-making. Of course it is a "Nice-to-Have", but it doesn’t provide the decisive impulse.

Cyril Alias: Then there is only the issue of modal shift and thus the issue of quality and service levels.

Cyril Alias: We are dealing with a reliable means of transport, there are virtually no accidents. Of course somebody is going to give me a [...]. But he won’t get so many cases together now. As a rule, these transports work extremely well. Very very very reliable. So and this is a value and this value can be taken into account when it comes to planning security, you actually have to keep the costs of this constant rescheduling against it, it is always done like this "yes super I have new data again, then I can reschedule again". But this constant replanning also ties up resources. So even if I let a computer do that automatically, which is mostly not the case in an inter-European logistics company anyway, but even if it were, it would mean constant rescheduling of resources, constant occupancy of capacities.

Cyril Alias: Planning security, on the other hand, means that I implement plans and can assume with a very high probability that this service promise will be kept. And that’s a promise I’m happy to make. Of course, I have to have good planning and know my customer’s needs well, and perhaps anticipate them well. So that I can also implement this system advantage. That’s nice that I’m reliable, but the customer’s requirements are constantly changing. So again on the subject of forecasting accuracy, together with this premise, I think you can exploit this system advantage and then you can say, and then take a look at the road. There is no such forecasting accuracy because it is full, because the system is overloaded. So many traffic jams result from the system load.

Cyril Alias: And that in turn destroys their service level, because many transports come too late because of the traffic jams. If I am too late at the port and the closing gate is already over, then this delay is extremely dramatic, because there are problems with the contract with the customer, because it is a problem in the customer satisfaction and reputation of the company. Also in collaboration with its partners in the supply chain is a problem. So I suddenly have quite a negative effect just to come from this one time being too late. That’s a disadvantage of the road that you can highlight as a bargeman and show that you can offer a positive alternative.
Nele Albers: Okay, then I would like to finish by asking you what your personal expectations are of future decision makers in logistics?

Cyril Alias: With regard to inland navigation?

Nele Albers: Yes exactly, first of all yes, if you would like to say something in addition, you are welcome to do so.

Cyril Alias: I'll start with the additional one that has nothing to do with inland shipping. So I think that the event the day before yesterday showed a decisive hint. Because the subject of digitisation is everywhere, even the Minister of Transport has included this word in his podcast and videos. The topic is omnipresent, for a long time it was only present in the media, but it is changing. We asked a whole series of speakers in preparation for our event and most of them, at least in the logistics sector, in the shipping sector it's a bit different again, talked about digitisation issues. Data, information, transparency and the organisation of information chains will therefore play an important role. What, in my opinion, many logistics players, perhaps also in inland navigation, have not yet understood is that it can be a huge opportunity. As a transport provider, I refine myself once again with my data. This makes me more attractive for logistics planners in the shipped companies, in large logistics service companies. By offering this value of reliability and appearing psychologically transparent, I mean not only that I am reliable, but also that I provide practically calculable data material and am therefore more attractive. I do believe that this can be an essential point in how inland waterway transport can be promoted. This applies not only to waterways but also to rail freight, in other words rail freight transport. There, too, infrastructure is perhaps a more important issue than it is here, but here too I see real potential.

Nele Albers: Okay, thank you very much. Is there anything else you want to tell me or add? Anything I haven’t asked yet that is important?

Cyril Alias: Yes, I had seen a question about the universities.

Nele Albers: Yeah, exactly, I didn’t know if I should bother you with that.

Cyril Alias: I find that very interesting, too. I had already mentioned this once. I believe that the decisive factor will be whether you came into contact with the topic early on in your logistics training. If so, then I always have that on my radar. I'll do an analogy with digitalization. The logistics managers, who are not used to it that everything is always scanned and transmitted via QR code and hosted with radar image version in any country, are critical of the whole thing and perhaps you are also oversleeping the digital transformation in our industry right now. Those who are a little younger and have a natural approach to technical equipment, even in their private lives, don't really have this problem. For them, this automatically enters their solution space, that things can also be solved digitally. Perhaps even primarily things can be solved digitally. And now the analogy to inland navigation, if inland navigation is always a part of the solution space, if I don't always sort it out in the first step, because things are too slow and then I only think about rail or road and then a short time later the train falls out, then only the road remains. If that were changed and if the factor of intermodal transport were also taken into account in training, and if the exaggerated weighting of ideas of flexibility were to be reflected in training, in other words if the issue of planning security were to be highlighted much more, I
believe that, to be honest, this would help the logistician to become more efficient and give inland waterway transport a more important role.

*Cyril Alias*: In this respect, yes, a very important topic and I do not see it covered at all in schools. I myself have dealt with two or three universities in Germany through my career, so I know what logistics curricula look like there and can tell you that inland navigation does not even play a role at the locations in which it plays an industrial role. So even in cities where there are a whole series of shipyards, inland waterway shipyards, not even at these locations does inland waterway transport play at least the same role as road or rail.

*Nele Albers*: That is, of course, a very good piece of information.

*Cyril Alias*: The topic is no longer really treated as a subject in its own form.

*Nele Albers*: It's a good thing you added that, and I didn't want to ask at first.

*Cyril Alias*: No, that's an important factor, because I believe that only by getting to know things at an early stage and getting to know the handling of tools and ways of thinking and so on, can I really deal with them and only then can I act intuitively with them. This is the only reason why I made the analogy with digitalization. I see that in small children who intuitively wipe around on a mobile phone or tablet and learn that and when they are two years old they are already faster than their parents and about ten times as fast as their grandparents. That just shows that the earlier I get to know things and perceive them as natural the better I deal with them later. That doesn't mean that I only solve everything digitally or in our case do it via inland navigation, that's not what I mean. Only it is not automatically sorted out and that is worth a lot.

*Nele Albers*: Thank you very much, you have really given me a lot of good information. I am very grateful for that, thank you very much and thank you for taking the time.
Nele Sophie Albers

Interview Transcript Sabine Bruns-Vietor

Date: 12.04.2019
Place: University of Applied Sciences Osnabrück, Caprivistraße 30A
Time: 13:00 till 14:00
Audio recording: Yes
Face to Face or Phone conversation: Face to Face
Additional Information: Extensive experience in the field of inland navigation from an industrial perspective and as a lecturer
Member check?: Yes

Interviewee information
Name: Sabine Bruns-Vietor
Nationality: German
Occupation: Professor of Business Administration, in particular Logistics Management

Working Experience
- Research associate at the University of Bremen, Institute of Shipping Economics and Logistics
- Product Management and Marketing Management, Bluewater Capital GmbH
- Quality, environmental and work safety management systems at Beluga Shipping GmbH
- Deputy Head of Studies, Dual Study Course Logistics and Process Management at Hanse Berufsakademie
- Professor of Business Administration, in particular Logistics Management

1 The appointment begins with the greeting and introduction. Afterwards Nele Albers gives an insight into the project and the contents before the interview begins.

3 Nele Albers: I'd like to start with a general introduction. What possibilities do you see in inland navigation?

5 Sabine Bruns-Vietor: First of all, inland navigation as a mode of transport is just as much a transport vehicle as any other.

7 Sabine Bruns-Vietor: And that's why every transport decision is basically first of all a potential possibility, which could always be taken into account as an alternative. And what other possibilities are there? Well, then there are certain groups of goods that have a special affinity for inland navigation and, of course, certain conditions are attached to the use of inland waterway vessels. In particular, the availability of transport routes. And since this network is much more wide-meshed than the road network, for example, it is generally assumed that there...
is much less potential. This is not necessarily the case, however, because in many cases, in my view, it is precisely the economic centres between which transport takes place that are, historically speaking, already located on the waterways, and it would therefore perhaps be necessary to assess the extent to which this coarseness actually somehow constitutes a deficit in terms of volume.

Nele Albers: Okay, thank you very much. Now you have already mentioned it once. As I said, there is no such thing as door-to-door transport by inland waterway. But do you see any other things in general that could boycott the whole thing, so to speak, or reasons why the potential is not being fully exploited?

Sabine Bruns-Vietor: Yes, so it is already evident that inland navigation, although, as I have just said, it is theoretically equivalent as a means of transport and as a mode of transport, is there as a potential alternative in every transport decision. But that is only the case in theory. In practice, it is not the case at all, but there is a blind spot at this point where inland navigation should actually be noted. And then there is rather the question why that is and that is certainly something that has developed in the long term. And many decision-makers have really taken inland navigation out of their consciousness or have not even brought it into their consciousness in the first place.

Sabine Bruns-Vietor: Anyway, both of them, certainly.

Sabine Bruns-Vietor: And yes, quite certainly, the fact that inland waterway transport is often simply more complicated than road transport, for example, plays a major role here.

Sabine Bruns-Vietor: So people like to repeat proven behavior patterns and once a thing has proven itself and the proven is then on the road, already in private with the car, and then you repeat that when something works, then you do not necessarily look for a better alternative but go the way that works. This is also something that is reflected in economic theory if one does not focus on the homo economicus perspective, but looks at these behavioural concepts of limited rationality, then one also sees that decisions are made not according to the best possible solution, but according to what has actually proved itself. And so it is the roads and railways that have proved their worth. Then why bother to look for something more complicated?

Nele Albers: Humans are creatures of habit, that's true.

Sabine Bruns-Vietor: Yes, exactly, and then inland navigation will eventually no longer exist in people's minds.

Sabine Bruns-Vietor: Then you simply stick to what has proven itself.

Nele Albers: Okay, thank you.

Nele Albers: Now, of course, I have tried in advance to find out to what extent logistics is taught here. I have seen that there are more logistics studies in the master programmes is that right?

Sabine Bruns-Vietor: Yes, there is an independent logistics course of studies, a part-time Master's course of studies which was performed in cooperation with the people of Münster and also originally with Enschede. I don't think the Dutch have been in for a semester now, but anyway, there is a part-time Master's course, but I'm not as involved in it myself. In the Bachelor's courses that we offer here at Osnabrück University of Applied Sciences we offer as
the largest course a general Business Administration course, which is called Business Administration and Management and within this course you can deepen the logistics.

_Sabine Bruns-Vietor:_ These are three advanced modules in Logistics and in addition you can choose a focus, then you choose these three advanced modules plus three further logistics modules and all together you have six modules in the second study section. In terms of depth and scope, this is basically the same as studying logistics.

_Sabine Bruns-Vietor:_ But it's business administration on top. Then, of course, we also have basic modules that all students complete. That's in the second semester and is called "logistics, procurement and production ".

_Sabine Bruns-Vietor:_ The logistics are also included here.

_Nele Albers:_ Okay, I can imagine that the basic courses will probably not discuss modes of transport in depth at first, but that will probably fall out. But especially when someone decides to focus on logistics and these six modules. Is inland navigation being taken up somewhere?

_Sabine Bruns-Vietor:_ Yeah, well, from me, yeah. But this is also due to the fact that my professorship is Business Administration, especially Logistics Management, and another colleague also has this denomination, but he, for example, tends to come from the production logistics area and, like another colleague, tends to come from the intralogistics area. And those who represent this intralogistics perspective, which is also a very broad field, do not have the same perspective of the transport sector and the means of transport and the modes of transport. In this case, subsidy technology plays a greater role and will then be more strongly represented. So this technical orientation, intralogistics or not intralogistics which plays a role to what extent this is actually represented at a university a little more deeply, this view of the individual means of transport. I came from Bremen or from the corner and worked there at the Institute of Shipping Economics and Logistics at the ISL. Yes, and at the latest since then I have also been active in this area of transport, transport logistics and have a connection to inland navigation through these maritime references and the view of hinterland transport.

_Nele Albers:_ Are you splitting the courses between you and your colleagues? So that some lectures teach intralogistics and your classes have a higher focus on transport? Or is it depending on the teacher what content students learn?

_Sabine Bruns-Vietor:_ So it's like this that the modules of course have a general module description and in a module there are also the means of transport named. But as far as inland waterway transport is concerned, I could not say that it is actually being taken up by my fellow colleagues. Actually, there would be a general discussion about what are modes of transport and what is the definition of means of transport and simply such fundamental characteristics will be mentioned, or the criteria for assessing transport value, transport affinity and so on will probably be discussed, but they will actually not be discussed any further.

_Sabine Bruns-Vietor:_ Well and in this respect, it has always been a little bit dependent on the lecturers which content and also if there is a focus on inland navigation included and is given on the way. There is no module description for inland navigation, but if inland navigation then is included in this term transport systems, mode of transport or something like that and because inland navigation is not so public anyway, there is a tendency, I maintain, to reflect this general under-representation there as well.
Nele Albers: One question, at the beginning I assumed that only inland navigation was excluded, so to speak.

Nele Albers: In previous interviews, I have already learned that modes of transport are rarely treated as such. It is simply based on a certain basic attitude. Is that also the case with you that simply modes of transport are no longer treated in this way, or is it inland navigation in particular?

Sabine Bruns-Vietor: Yes, both. In fact, I can also confirm that the transport modes as a whole, even for me when I came to Osnabrück here about five years ago, are actually surprisingly little addressed at all.

Sabine Bruns-Vietor: Inland navigation will then only be shown in one graph at all. Exactly this is first of all a phenomenon that the modes of transport themselves still find relatively little space at all.

Sabine Bruns-Vietor: For example, there is no event like the one I taught at another institution, there was a module called TUL Logistics, Transport, Handling and Storage Systems. And there you really did talk about lorries and railways and inland waterways and about all these transports and also about the technologies that are used and what is a semitrailer and what is an articulated train? But that is not the case here in this form and for me, who comes from the logistics sector that is closer to transport, the question was actually why is this so and in my perception it has something to do with the general image of logistics. That's a phrase I've often heard from my colleagues.

Sabine Bruns-Vietor: They always say, yes, logistics is not just transport, it's a kind of justification for this dirty image.

Sabine Bruns-Vietor: You don't want to identify yourself with this image and that's why it's called logistics management and not just logistics and from that point on it becomes abstract. From that point on you have the possibility to use such a management tool and methods and everything like that and not to deal so deeply with the original logistics, which also includes transportation. So if you tell the students that we look at what trucks actually are, well then it's not as if they find their eyes shining and even though it's not such a conscious process, it's already the case that this image of logistics is "only transported and only stored and there are tariffs so bad and poor truck drivers", a whole negative picture that's so close to this "logistics is transport."

Sabine Bruns-Vietor: And then they say, yes, it's not just transport and you look at the other things.

Nele Albers: That's also very interesting for me, I haven't heard that before. But I can very well imagine that inland navigation has a dusty image, I've noticed that before, but I find it very interesting that logistics as a whole has some image problems to contend with. That is difficult, of course, but that is a very abstract question, but do you think that it is because the various modes of transport are no longer dealt with in universities, that it contributes to industries such as inland waterway transport, now I have heard that the train is probably the next mode of transport, that will be used less and less?

Nele Albers: Do you think that actively contributes to this?
Sabine Bruns-Vietor: Certainly, because in a teaching one has the possibility to create consciousness and to create knowledge and thus also to create consciousness around these alternative possibilities of action. And if inland navigation is not even mentioned as an alternative possibility, then the blind spot remains in the training from the very beginning.

Nele Albers: The goal now is that once these competencies have been filtered out, bremenports wants to develop an e-learning portal for logistics students and young trainees. On this portal, the students can then deal with the topic on a voluntary basis, so to speak, and deepen their knowledge. Do you think that would help? Do you think that this is a reasonable alternative in the short term?

Sabine Bruns-Vietor: Every way to avoid this blind spot is good.

Sabine Bruns-Vietor: That's right. And I believe that perhaps it makes sense to do so against this background, which I have just explained, that something like this is also offered by another institution. As I said, the blind spot is already partly present in the teaching staff and exists not only for image reasons, but also because inland waterway transport or modes of transport do not occur in all technical disciplines. But even if one does not have one's own specialist focus somewhere, one sometimes likes to accept such impulses in order to broaden one's spectrum.

Nele Albers: Great, thanks. Now a question that is decisive for my work. But I know that this is always difficult to answer. But if you think about this topic now, what do you think would be possible competences that you would like to give to a student if he or she were now considered a future decision-maker in logistics?

Nele Albers: What kind of skills do you think should be taught in the field of inland navigation?

Sabine Bruns-Vietor: It is important that in some way inland navigation is presented as a possibility at all. That is to say, a fundamental knowledge of the fact that it is an equally important mode of transport which is examined according to certain criteria. This quite normal selection procedure for means of transport, how to proceed with the selection of means of transports. You probably even have to start a little earlier and say that you always have to choose a mode of transport at all. This is probably the first step. That's exactly what you can turn around in the recording. First of all you have to say, something has to be transported and you have to say, there are alternatives. And then you say that these are the alternatives and that inland waterway transport is also there. And you need the procedure how and according to which criteria you choose. If you have that, then it would be important to know, if you have calculated and determined in this case inland navigation would be good, whom do you address? So, then the next step is how to bridge this gap into the foreign country. I sometimes tell my students the different modes of transport, it's like travelling to other countries, it's always different cultures.

Sabine Bruns-Vietor: For example, there are different legal bases. You also always have your own specialist vocabulary. One has one's own technologies and one also has - and this is particularly important - different actors and interest groups, so the institutional framework is also different. That is why we should somehow make it clear who we are addressing. If you want to organise truck transport, well, today you no longer open a telephone book, but in that sense and then you know straight away, Ah, then you just look under freight forwarders or under logistics and then you find contact persons there and you can simply call them. But what is it actually like when you want to do inland waterway transport? Just naming such processes and contact persons is certainly something important. In general, I think it is fundamentally correct and sensible to have a few key data for the knowledge of modes of transport. That you also know something about the other mode of transport, about the infrastructure, a few key data about
the actors, a few key data about the regulations and a little bit about the political institutions, who are the associations actually.

*Sabine Bruns-Vietor:* These are actually things that are always written in the books of these forwarding agencies/companies.

*Sabine Bruns-Vietor:* And yeah, I think I’d make a point of that for now.

*Nele Albers:* Great, thank you.

*Nele Albers:* Are there any special competences or a particular focus that you set in your lessons?

*Nele Albers:* Do you focus on exactly these key data or how do you deal with it?

*Sabine Bruns-Vietor:* Yes, that’s exactly how it is in the basic lectures; first of all, all modes of transport are simply presented. That there is this subdivision into land transport modes, water and air. There is a subdivision in this context, which I will also discuss. There is, for example, an organisation of inland waterway transport as a mode of water transport and then I say that inland waterway transport is a land mode of transport. Why? In order to make these competitive relationships between rail and road clear and then to show, aha, you have to choose. Then there are the figures for the modal split, also in historical terms, which show how transport services and traffic volumes have actually been distributed among land transport modes in recent years, and there is such a graph from 1995. But these key data are actually only being discussed in more detail during the advanced courses.

*Nele Albers:* All right, thank you very much. Then let’s go back to the industry in general.

*Nele Albers:* In my research, which I did in advance and in which I first dealt with competencies, I have found that competencies in the professional world are often linked to a permanent job. It is determined which competence one has to have and be able to have in order to achieve the goals in the profession. And companies that are really good at naming these competences also link these competences for the job directly to their strategies for the company. So that practically everything plays into it in order to achieve certain goals later.

*Nele Albers:* If this were now to be considered on a very large scale and applied to the inland waterway industry, what would you say would be the long-term objectives of inland waterway transport?

*Sabine Bruns-Vietor:* Oh yes, I have to ask again, what exactly does the question aim at?

*Sabine Bruns-Vietor:* By this you mean the inland waterway transport mode as a whole and not the industry that uses inland navigation?

*Nele Albers:* No, exactly, inland navigation as a mode of transport.

*Sabine Bruns-Vietor:* So what competencies should they expect from their people?

*Sabine Bruns-Vietor:* Well, I mean, that they’re in control of their profession.

*Sabine Bruns-Vietor:* That’s kind of clear, of course. The bargees must also be able to handle an inland waterway vessel. Besides, it is always important that this connectivity is established in
the entire logistics system, which supports the economic system, that this connectivity is established. And this shows that this is not an automatic process.

Sabine Bruns-Vietor: And the question is, how do you establish these connecting factors? On the one hand, these are very strongly communicative things that are important there, and also bring this into consciousness and throw out communicative "ropes" is actually the first step for what you then also call a network, as a social structure, in which you are actually involved.

Sabine Bruns-Vietor: And that includes, if one belongs to a social structure, not only this network which one speaks nicely with each other and something like that, but a social structure results above all in a context for action. In other words, certain behaviors, certain actions and, if possible, the inland navigation that is used belong to them, then this social system is the formative behavior. For this you have to communicate and therefore have communicative abilities and because communication often also takes place now in a digital way, these competences have to be shaped.

Sabine Bruns-Vietor: And then to use all these communication channels.

Nele Albers: Great, thank you very much. I would like to talk again about the learning inventory that is to be created.

Nele Albers: I would like to know again from your experience how it is best to convey competences apart from the topic of inland navigation on the basis of which teaching materials?

Sabine Bruns-Vietor: I'm in the process of developing a lot myself. First of all, a book is the most effective way to impart knowledge. Lectures with a corresponding script, PowerPoint presentations and simple courses, where knowledge is imparted, are also an important basis.

Sabine Bruns-Vietor: I am also of the opinion that in basic lectures you have to and should simply convey certain facts in normal lectures in order to deal with this subject in a reasonable time. Working on case studies helps in the specialisation.

Sabine Bruns-Vietor: Such case studies have to be found somewhere first. Why don't you do a case study? It's not that trivial, you don't find a good case study that easily

Sabine Bruns-Vietor: Yes, but this is something where one should come to active learning in the deepenings.

Sabine Bruns-Vietor: This is where I actually go different ways with the case studies and one or the other excursion is helpful, especially here in Osnabrück, where the harbour is a nice place.

Sabine Bruns-Vietor: But there is also this so-called problem-oriented learning.

Sabine Bruns-Vietor: Yes, you basically have a case description and certain problems that arise from this case to be solved.

Sabine Bruns-Vietor: And then the students basically have to find out for themselves what kind of knowledge they need. They first have to determine this and then actually acquire this knowledge themselves. That is the problem-oriented learning and what activates and scatters the search for knowledge a bit.

Sabine Bruns-Vietor: What else do we have, anything, movies?
Sabine Bruns-Vietor: In fact, I sometimes use these materials from vocational training that I have just mentioned. These are things from the training profession freight forwarding and logistics businessman/ woman, whereby there is also inland navigation vocational training. That is perhaps not so uninteresting at times, but in any case forwarding and logistics manager, that gives a “little butter to the fish”, those are real little calculating things. Even if something like that doesn't really fit in there. It's a bit like hanging up something like inland navigation on current trends and it's nice to have examples of this and the topic of sustainability is a big one. Digitalisation is also taking place in inland navigation. But sometimes such things are also great if you can have them in a lesson that triggers such an aha effect. For example, when I ask how old is a truck? They are all new because most of them are leased. Yes, and how old is such an inland waterway vessel? If you then look at how old they are and imagine you would have to use a truck that is 50 years old to carry out their transports, what do you think of that? Such character traits, which are a bit crazy, which you can use in this sense for Aha effects, that would somehow be quite nice.

Nele Albers: That was actually my "aha" effect when I learned that inland vessels can live up to 60 years.

Sabine Bruns-Vietor: Yes, exactly, those things that are a bit quirky but are also embedded in the present time.

Sabine Bruns-Vietor: Sometimes it is helpful if you have such information about it, if you don't actively participate in this profession, you will only notice it if you get the corresponding information yourself.

Nele Albers: Yes, then just finally, do you have any personal expectations of your logistics students, anything that you hope for that they will become?

Sabine Bruns-Vietor: Yes, this buzzword of sustainability is actually one of those things I attach great importance to and which is also very important to me personally. For example, I rarely drive a car myself, almost only by train and bicycle or public transport, and I think it is also important that you ask yourself first and foremost in your business studies and logistics studies where you can avoid transportation. Where can you consolidate transports?

Sabine Bruns-Vietor: And that one sees logistics as a function of the economy and the economy as a function of society and not as an end in itself.

Sabine Bruns-Vietor: This is actually important to me, because it relativizes these questions about optimization and profit making a bit and puts them in the mirror, what is actually good for a society or about which things does a society actually want to express and realize itself.

Sabine Bruns-Vietor: And for that it needs a certain economic system and how that should be designed? A society can decide that and if you say that you will have an economic system like that, then you also need the right logistics. But it's also the case that it's important to me that the students take with them, that they can make decisions and that it's not a law of nature, that it has to be that way because something forces it.

Nele Albers: Okay, thank you very much. That was a very nice conclusion. Is there anything else you would like to add? Thank you very much.
### Interview Information

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### Interviewee Information

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<tr>
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<th>Jörn Josef Boll</th>
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<tr>
<td>Nationality</td>
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<tr>
<td>Occupation</td>
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<tr>
<td>Working experience</td>
<td>- Inland navigation helmsman</td>
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<td>- Project Officer (European Projects)</td>
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1. **Nele Albers**: If you have any questions for me or something is incomprehensible, please feel free to let me know. My first question would be, what possibilities do you see in inland navigation?

2. **Jörn Boll**: I find the question very global.

3. **Nele Albers**: A lot fits in there.

4. **Jörn Boll**: A lot fits in there, that's right. Inland navigation is, of course, a bit of an ugly duckling in the logistics chain. Especially in Germany there is a lot of ignorance, I would even say many prejudices. Many logistic service providers see inland navigation a bit as "mum and dad are riding the ship with the dog, that's reliable and slow". There is also a growing prejudice that inland navigation is dirty, which is not necessarily true if you look at the figures. However, you have to realize that many transporters, in the logistic world, calculate in trucks and the truck is what you know and truck is what you want. Therefore, if you ask me what opportunities I see in inland navigation, there are many of them. Inland navigation has capacities, inland navigation is currently undergoing a process of modernisation. And I also have to say to a process of professionalization, the married couple as it is known from time immemorial, I grew up on such a ship myself, my parents do it, the dog died last year, but it was really this idyll and it is dying out. What you can see is that we are getting more and more shipping companies that are specializing more and more. These are, for example, tank shipping companies, these are shipping companies that drive containers. But this is more and more the case with larger ships. The standard is now the 110 metre ship, which cannot sail everywhere in Germany. But 67 metres of ships or the 85 metre ship are getting older and older and you will see that most of them will disappear from the market over the next ten or twenty years. The expansion of the fleet has brought with it certain disadvantages. On the one hand this is good for logistics, which is the case with freight prices, because in the end the fleet has not become much smaller, but capacity has increased massively. If you compare it, a skipper had an 80 meter ship with 1100 tons carrying capacity and invests and buys a 110 meter or 135 meter ship with 3000+ tons.
carrying capacity. Then in the end they exchanged one ship for another. So the effect on the number of the fleet is zero but you created almost 2,000 tons more cargo volume. That was a problem at the beginning of the 2000s, until now actually. I was still talking about modernisation, modernisation of course means that we will get new clean engines in the meantime. At the moment these are mainly internal combustion engines. However, there is also a lot of movement in the market. I am thinking here of electric ships, mainly hybrids, electric drives, diesel electric or LNG or even hydrogen electric, where we are currently doing a pilot project with our Emely, which is getting a fuel cell. A few years ago LNG was really the fuel of the future, the euphoria has subsided a little, but it will certainly find its place, but it will not become the fuel of the future.

**Jörn Boll:** I think it's gonna be a mix of different things. There are projects for purely electrically powered ships, which is suitable for container ships, for example. Batteries are then developed that are ultimately a container, which has little influence on the cargo capacity of the ship.

**Jörn Boll:** That's the kind of thing to do. Hybrid is a big thing, hydrogen will come more and more, at the moment still very expensive, but once this is developed, prices will also fall. So as far as the cleanliness of the sector is concerned, a lot will happen in the near future in environmental terms and it was foreseeable that the old ships with the old engines will more or less leave the market.

**Jörn Boll:** Yes, these are the possibilities for inland navigation.

**Jörn Boll:** Would you like to find out more about what inland navigation can do for logistics companies?

**Nele Albers:** I'm particularly interested in it from your point of view. What I have heard so far is that it will inevitably mean that more use will have to be made of inland waterway transport because road capacity has been exhausted.

**Nele Albers:** That was a lot of what I've heard so far.

**Jörn Boll:** Yes, that is of course a bit of the standard thing. Of course, inland navigation also has its limits. It is very dependent on a very expensive infrastructure, such as canals, the development and maintenance of rivers. This is often a problem, especially in Germany. I am now thinking, for example, of the Elbe, above Magdeburg to Saxony, where at the moment deconstruction is more the order of the day than expansion.

**Jörn Boll:** Quite simply because people say we want to preserve the habitat river and we don't want it to be a highway. And these are interests that conflict with each other. When I look at the Elbe, I say that the interest in unspoilt rivers is greater than in the river of transport possibilities. The Elbe is navigable, but perhaps for a hundred days a year, because there is often too little water.

**Jörn Boll:** So, if you really want to use that, then massive investments would be necessary which are politically probably not feasible at the moment. Otherwise, the West German sewer network needs renovation, the locks were mostly built at the beginning of the century, in the first half of the 20th century for tow trains and tugboats. At the moment, many locks are gradually being replaced. The Rhine-Herne Canal has now been completed and the Mittelland Canal is under construction. The large locks in Magdeburg are finished. Towards Berlin they are still building and not quite finished. But when I look at the Weser-Dattel canal, which is really a very important connection from the Ruhr area to the Rhine to Holland, there is really an investment backlog at
the locks and the locks have really reached their end of life. And the locks aren't built for the big
ships that sail now. In the past there were ships with a cargo of 2000 tons. There are now ships
weighing 5000 tonnes. In order to use shipping efficiently, a good and efficient infrastructure is
necessary.

Jörn Boll: This requires investment, but not to the extent that it goes well. Another limiting
factor, of course, is that waterways are not everywhere.

Jörn Boll: They often have to consider the ship as a link in the transport chain. It is also always
necessary to perform another transhipment operation.

Jörn Boll: If, for example, we have a transport from a seaport with raw materials to a factory
located on the water, then it is ideal, then they do not need this transhipment. If, however, we
are talking about a good where the recipient is a little further inland, then, if things are going
very badly, we have to take the lorry from the factory to the port, to the ship, by ship to the
nearest port from the recipient, reload onto the lorry and then the last few kilometres back onto
the road. These transhipment operations naturally make it expensive and often unattractive.

Jörn Boll: It then takes skillful planning of inland navigation in the logistics chain to be able to do
this effectively. One point is, inland navigation has many advantages, it is cheap and you can
trust it, it is reliable, it is green. But you have to know the limits that inland navigation has and
you have to work with them. Many logistic service providers shy away from this step of
integrating inland navigation in this chain because many flows of goods are too small for a ship
that can carry 3000 tons. With 30 tons or less, you often don't even think about doing it by ship.

Jörn Boll: Whereby container transport is actually a good option, by water.

Jörn Boll: But inland navigation also has to work on itself and it does so. That this image with the
married couple with the dog, that it becomes more professional. But that's what's happening
right now and when that's done, I see a lot of possibilities.

Jörn Boll: Now to question two? Is that enough for you?

Nele Albers: Yes gladly, now of course we have to adjust question two a bit because I have talked
to lecturers who work more in the logistics bachelor area so far otherwise. I am well aware that
you are now integrating inland navigation.

Jörn Boll: We're not doing anything else here, right.

Nele Albers: But then maybe from a different perspective.

Nele Albers: Has the learning content developed over the years? Is it any different now? I say it
now quite stupid, one tries to sell the "groovier"?

Jörn Boll: That's where you hit a nerve with me. Yes, of course we use social media channels to
market it.

Jörn Boll: But if we look at this school, we actually had a relaunch in 1999, when a new director
came. Before that it was an inland navigation school where the apprentices wore uniforms.
There was a very strict hierarchy. There were dormitories and the students ran away screaming.
We had to make an enormous modernization blow. We have no more uniforms and no more
dormitories. The apprentices sleep on their chambers with a maximum of two people when they are here. They have leisure facilities.

_Jörn Boll:_ It's all a bit more modern and the hierarchy is a bit flattened. The Netherlands does not really stand for a strict hierarchy. We have already made this move and it has also made it much more attractive for apprentices.

_Jörn Boll:_ We had about 30 apprentices here since 1999, then we reached a peak in 2014/15 where we had about 200 new apprentices in one year.

_Jörn Boll:_ Since then, it's been running back slightly.

_Jörn Boll:_ But that had an enormous impact on it, also by investing in teaching materials. We are completely digital. Our apprentices, students all have a tablet, of course there are still books but all learning materials are digitally available, the program is called "Matroos op Koers".

_Jörn Boll:_ We have a robot room where apprentices learn to program machines. This was sponsored by Lego and on the other hand we bought 3D printers where apprentices learn to make technical drawings and insert the 3D printers. In general, the look and feel of the school is much more modern. But of course we still have traditional places for woodworking, places for metalworking in the engine room. There are diesel engines that are disassembled and reassembled, that are started, that are checked. Where these manual activities are simply trained. We have places where the students learn to knot and splice, to work with rope. These are things you can't do digitally.

_Jörn Boll:_ So we also have these courses.

_Jörn Boll:_ Besides, we take part in programs like the Young Solar Challenge, we build a solar boat once a year with which we race. We have a shipyard where there are smaller boats that are constantly burnt apart, welded together and repainted. We also have to learn these activities. Yes, that is part of it. Rowing is part of it. In Harlingen we have some canals that lead through the city. We have a small pit foreman very close by, there are rowing boats and the apprentices have to learn to row and mend.

_Nele Albers:_ I really think that's a very broad spectrum.

_Jörn Boll:_ We also have normal lessons. So mathematics, physics, chemistry, Dutch, English, nautical to German is also a subject.

_Jörn Boll:_ So really standard subjects for a secondary school. Because we are a VMBO school, we have to offer everything that the curriculum for secondary education provides and also bring in shipping.

_Nele Albers:_ Then let me ask you a question. You have also studied, why do you think this is the case in Germany in particular that inland navigation is no longer taught at logistics colleges or courses of study and in some cases is no longer included in the training courses?

_Jörn Boll:_ I just said it, it's ignorance.

_Jörn Boll:_ I think you know what you have on the truck, the truck is practical, you arrive at the consignor with an empty trailer. Then the batch is loaded or the container is loaded or the tank is filled and you drive to the customer. It's that simple.
Jörn Boll: This is justified, but if you drive the A1 between Bremen and Hamburg on an average afternoon, then you hardly get into the right lane because one truck follows the other.

Nele Albers: That's right. But do you think it would make sense to provide additional inventory?

Jörn Boll: Yeah, it’s even imperative. After all, inland navigation has the potential to absorb free potential for freight flows. This mainly involves flows of goods with a larger volume, which go back and forth between industrial centres.

Jörn Boll: I am thinking here of the supply of raw materials by large energy-intensive companies, which is already happening. Nobody would think of supplying a power station on the Rhine with coal by truck. Of course, coal is now also on the decline. When you think of the chemical industry, which is based on the Rhine in Leverkusen Bayer, in Ludwigshafen BASF. It doesn't make sense to drive the raw materials, semi-finished and finished products in large volumes, some of which are also destined for export, overseas in tankers to the seaport.

Jörn Boll: Where it makes a lot of sense and obviously makes sense, you will do it. Even large-volume project transports are put on a ship wherever possible. On the ship this is often simply general cargo, light general cargo, which can be taken quickly from A to B, which costs a lot of planning, a lot of lead time and still a lot of money to do this on the road, because you have to plan heavy transports, which, if they are too big, also need police escort or roads have to be blocked or bridges have to be reinforced. Of course they do not have that in inland waterway transport, so where it is obviously logical, inland waterway transport will be used by everyone.

Jörn Boll: It is actually more about the space between, it really makes no sense to use inland navigation and that is, for example, the company that has to transport 20 tons from Bavaria to Baden-Württemberg once a week.

Jörn Boll: I would also say that this is not a flow of goods that belongs on the inland waterway vessel. But of course there is the area where companies really transport larger quantities from A to B, if possible from seaport to seaport or from river to river. Where it might be worthwhile to think about whether transport by water, by waterway, makes sense after all.

Jörn Boll: For example, on the Neckar, last year, spent fuel elements were brought from Gundremmingen to Neckarwestheim over the water. That was absolutely no problem.

Jörn Boll: That was three or four rides, no, it was six rides. That was not far but both stations were at the water. That went actually very well. But you can do something like that if you want.

Jörn Boll: What other role models are there where that would work? Especially the project planning, but that will be done anyway where it goes over water. Containers, for example, along the major European waterways there are sufficient container terminals, where it is quite possible that industry from the surrounding area will not bring their containers directly to the seaport, but will deliver them first to the inland terminal and then on to the seaport. The model for this is, for example, Haldensleben near Magdeburg, where there is such a small terminal. Two or three ships a week go to Hamburg, they collect everything from the surrounding area and then go by ship to the seaport. This is actually a nice example of how you can combine small flows of goods to make a ship full, because for one container a ship of course does not go. One can integrate it very well.

Jörn Boll: But of course you always have to look from case to case and it really makes sense. But you should look open-ended. I am not saying that it is a solution for everything, it certainly is
not. But it will certainly be a solution more often than you think. The question is, are we prepared to break new ground? Do you want that as a company or do you not?

*Jörn Boll:* Frequently, the shipping companies leave the choice of transport modality absolutely to the forwarder and if the forwarder has lorries, he will use lorries. What else should he do?

*Nele Albers:* Okay, thank you very much. Then I'd like to get to the main component I'm looking for.

*Nele Albers:* Because you really grew up with inland navigation, what do you think a logistician actually needs in terms of competences in order to get inland navigation back on his radar at all, or what does he need in order to be able to actively implement this?

*Jörn Boll:* In the final instance, this is also due to the sector, which must make itself better known, promote its own strengths and also present itself as a veritable solution which it often is.

*Jörn Boll:* Of course, this also includes making inland navigation as such better known again in logistics circles and proactively offering solutions for certain problems. This, of course, is mainly achieved through price. If you can say: You have 40 containers per week, which go from, quite flatly said, Hanover to Hamburg. Now you do it with the truck, now look, put them to Stöcken (Hannover Nordhafen), there is a container terminal, put them there and let them take the ship to Hamburg, that takes a bit longer. But brings you a cost advantage of this and that, but it remains predictable and inland shipping is of course always a bit slower than the truck, it remains so, but in the majority of cases it is the case that it does not depend on the day but it must be predictable, that you say it takes two days to Hamburg and a night or a few hours by truck. If, on the other hand, you can indicate a monetary advantage, then I think that will also be an interesting solution.

*Nele Albers:* And for the logistician himself, if he or she is to use it again now, does he need to know certain things about it?

*Nele Albers:* So are there special things that you need to know in order to be able to use or plan for it?

*Jörn Boll:* One should know which ships there are, where are the waterways. To find out which ship can go where.

*Jörn Boll:* And he should also know if the consignor or the company that has transport needs is perhaps located near a navigable river. Then it's not really a big secret of inland navigation, it's like being transported by lorry, you load something on it and off you go from A to B, it's not witchcraft, it's not like being moored somewhere and repacked again, it's not like that. When the cargo is inside, the hatches usually close or when the containers are on and off. You should know what the lead times from A to B are but there are planning tools like Blue Road Map.

*Jörn Boll:* I can show you that. [...] 

Mr. Boll and Nele Albers stand up so that Mr. Boll can open and show the Blue Road Map program at his desk.

*Jörn Boll:* What else could be offered to the logistician? In the end, clattering is part of the trade and actually everything is about the price. You have to be able to offer an attractive price.
Nele Albers: Then I would very much like to know whether you have learning goals or module handbooks that correctly state what competences the students should have.

Jörn Boll: Yes, we have, and we even have it for Europe. Would you like to have them?

Nele Albers: If I could have that, that would be great.

Jörn Boll: [...] It's still work in progress.

Mr. Boll gets up again to open the file and send it to Nele Albers.

Nele Albers: Then, on a more general issue, I have done some research before, especially in the area of competences and how to define and develop competences. Competences are often really tailored to a profession.

Nele Albers: If we were to put it very roughly now and say that we do not tailor competences to a particular occupation, but rather to industry, we would be doing so. And these competences are linked to the goals of the industry, so how would you describe the strategic goals of the industry?

Nele Albers: A goal, a point that the inland navigation industry should still reach?

Jörn Boll: Yes, what we would like as point A is for the training to be given a formal standard. This is not yet the case. Yes, otherwise we are really fighting for apprentices at the moment. We have to make ourselves attractive to young people who want to take up this profession. Because you have to admit that it is certainly not something for everyone. You're away from home for a long time, it's very labour-intensive. You live in a very small space and it's nice if you like it, but not for everyone. Our biggest problem or strategic goal is to become attractive for young people, to whom we actually subordinate everything at the moment.

Jörn Boll: Apart from the fact that we really do want formal education as a standard throughout Europe and formal education based on defined competences and not on mutual recognition.

Jörn Boll: The system in force at the moment is mutual recognition. This means that Germany recognises the training in Hungary. And that is actually too little, because nobody guarantees that the level of training is comparable. Nobody guarantees a certain standard. That is what we say as schools, we need something like the distribution of competences that you have just seen. We would like to see that throughout Europe, as a minimum standard for everyone who comes into the sector. That is our strategic objective.

Nele Albers: And that is also understandable.

Nele Albers: Since a kind of learning inventory is to be created and you really work a lot with young people, I would like to know what makes it attractive in your eyes to learn for young people? And if you now think specifically about e-learning, what are the materials or ways you would suggest to learn? What do you say is well-received by young people, what is effective for teaching competence?

Jörn Boll: E-Learning has become standard. We can bring young people a book or a multiple choice test on paper but then you've already lost them. You have to provide a learning environment that young people understand and accept. This is usually electronically digital
wherever possible. What do you have to do to make it attractive for logisticians? Which logisticians do you want to address?

Jörn Boll: Vocational school as apprenticeship for logistics, forwarding merchants?

Nele Albers: The primary focus would now actually be on Bachelor students.

Jörn Boll: Experience-oriented learning, that one also sees what it means. Show a barge, provide background material, maybe even for a logistician, that he can practically take part. On a truck, on a train or sometimes on a ship or going to the port, you see what happens.

Jörn Boll: What am I doing? What are the consequences of my actions? And to make that bold. Would perhaps be quite practical for an internship in logistics training.

Nele Albers: Finally, what are your personal expectations of future decision-makers in logistics?

Jörn Boll: What do you expect what I expect? I would be happy if shipping as such moved away from its bad standing, which it obviously has at the moment in the logistics world. In my opinion this bad standing is understandable in some cases, but I think it is often wrong. The sector is working on itself, the sector is professionalising itself at the moment, if you look at the Netherlands you are already much further ahead, but of course this is also possible because the country is crossed by waterways and inland waterways and has much more transport volume than the railways, which is logical because they can get anywhere.

Nele Albers: Is there anything else you'd like to add?

Jörn Boll: No that was it.

Nele Albers: Great, thank you for your time and information.
H.6 Interview Transcript Jan Sönke Eckel

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| Occupation              | Jan Sönke Eckel: RheinCargo – CEO  
Lukas Klippel: Head of marketing and sales at RheinCargo |
| Working experience      | Jan Sönke Eckel  
- Trained forwarding merchant  
- 20 years of professional experience in the operation of inland ports  
- From 1998 he held various management positions at the Neuss port operations and from 2003 at the Neuss-Düsseldorf ports.  
Lukas Klippel  
- Market Area Manager/Key Account Manager at EUV  
- Sales of the Cologne ports  
- Head of marketing and sales at RheinCargo |

1 General greeting and thanks were expressed to Mr. Jan Sönke Eckel for taking the time for an interview. Mr. Jan Sönke Eckel mentions that he has his colleague Mr. Lukas Klippel on the phone and they are in the car. It was inquired whether the telephone call may be recorded in order to prepare a transcript later and whether the transcript should be sent back for examination. Mr. Jan Sönke Eckel gives his permission for the recording and asks for the transcript to be sent.
Jan Sönke Eckel: Yes well, you do not need to ask the questions, we have them here in writing. Let me be very brief read the first one. Your first question was, what opportunities do you see in inland navigation?

Nele Albers: Yes exactly.

Jan Sönke Eckel: Yeah, well, I could answer that now for three hours. Can we make that a little more concrete?

Nele Albers: Of course, I'd like to. Precisely because you come from the industry, if you now include inland navigation, why would you choose it? What advantage does this offer your customers?

Jan Sönke Eckel: You mean, compared to other modes of transport?

Nele Albers: Yes.

Jan Sönke Eckel: Okay, all right. Yes well, I'll put it this way, inland navigation has strengths and weaknesses like any other mode of transport. Inland navigation is, of course, geographically restricted for the time being, because logically it only works where there are waterways. Of course, whether it is the Rhine, the Danube, various canals or the Weser, the Elbe... Inland navigation is of course Germany-wide and Europe-wide and cannot function everywhere with traffic from A to B. Of course, inland navigation is geographically limited to a certain extent. So in this respect one can say that when it comes to advantages, they are of course always where inland navigation can naturally function, for example on the Rhine. If I may now refer to the example of the Rhine - well, it certainly also applies to the Weser - inland waterway transport ... we actually have to differentiate here. Container inland navigation is something different from inland navigation of conventional goods in the general cargo sector. But if I now refer to the bulk or general cargo sector, inland navigation certainly has the advantage if a shipper sees himself in a position to fill such a larger vessel with quantity that it will then be cheaper per tonne - per whatever - than the lorry; that should normally be the case. In this area, you will have cost advantages over the lorry and, if in doubt, also over the railways. However, this presupposes that the shipper is able to fill inland waterway vessels with a loading capacity of 1000 tonnes and more (up to 4,500/5,000 tonnes). Then there are the big cost advantages.

Jan Sönke Eckel: Then inland navigation is very reliable, now also in relation to the time axis. It may be slower here and there, but it is not always a matter of how fast I arrive somewhere, but it is certainly also crucial that I arrive when the time window of the person receiving the goods is right. And I know that inland waterway transport is actually the most reliable mode of transport. We have no traffic jams on the Rhine or other waterways; in other words, if a ship departs from any port in Aachen, the skipper can say exactly when he will arrive. So not exactly to the minute now, but to half an hour it always works. The truck doesn't usually manage that. Due to unpredictable traffic jams, etc., reliability is certainly not guaranteed or it has to work with a lot of time and safety factors. Which of course makes it more expensive again. And the railway is basically also a very reliable mode of transport, but of course it is subject to rail infrastructure and perhaps even to issues that inland waterways do not have.

Jan Sönke Eckel: Inland navigation really scores with price and reliability.
Nele Albers: Okay, thank you.

Jan Sönke Eckel: The next advantage of inland navigation compared to trucks is that it can be operated seven days a week, 24 hours a day. At least on Sundays and public holidays, the truck is subject to certain regulations that the inland waterway vessel does not have. From the side very very barrier-free. Perhaps this is about the advantages of inland navigation.

Lukas Klippel: So yes, I would say that the large capacity, if the customer can take this up, that is of course a prerequisite, then this is not only an advantage for the customer in terms of costs, because the transport as such is cheaper, than comparable to the logistics of the customer, so the handling of the goods. If you imagine now that you get 2000 tons of sand for your production, if you get them all by truck to your plant, that would be a huge logistic effort, which you have to operate and maintain the infrastructure. Handling is simple, a simpler one in my opinion by inland waterway vessel. That can definitely be seen as an advantage.

Jan Sönke Eckel: And there’s something else important on the subject of sluices, as certain bottlenecks can occur. But if you leave that out, the waterways can still tolerate large capacities. And in reverse, there are no traffic jams or anything else, but that is of course also an topic.

Nele Albers: Okay, thank you very much for your answers.

Jan Sönke Eckel: Okay, is your question one answered with that?

Nele Albers: Yes, thank you for answering question one.

Jan Sönke Eckel: Okay, then let’s go to question two. What do you think could be the reason why inland waterway transport is not being fully exploited, despite its advantages?

Nele Albers: That’s exactly right. If you look at inland navigation now, it is supposed to be more environmentally friendly, it is a relief of the roads and it is sometimes even cheaper. Nevertheless, there must still be reservations, otherwise it would already be fully exploited.

Jan Sönke Eckel: Yeah, okay, maybe we’ll come back to question one for a second, we forgot something huge. The environmental issue, which I indirectly said last week in Duisburg, is that, from our point of view, inland waterway transport, in addition to rail transport, is of course much more environmentally friendly than lorries. So last week I told you a bit about the external costs of trucks, but of course you shouldn’t forget that. These are certainly not economic advantages that can be seen in the short term, but if a company says, of course, good, we also include external costs and we have a green thumb as a company, of course we must not forget that inland navigation has some environmental advantages over lorries, at least from our point of view.

Jan Sönke Eckel: On question two, so I do not know, you naturally have supply and demand factors in inland navigation just as you do in the lorry and rail sectors. That is a good thing. Supply and demand are very important, otherwise our entire economic system would not function at all. That is why I do not think we can now say in general terms that inland waterway transport has capacities that are not being used. So now, apart from the free capacities on the waterways,
I think there are many more trips over the year, the demand for inland waterway transport is greater than the supply, which then has an effect on freight, etc., and there are phases when there is more supply of capacities and demand is lower. So to say that inland waterway transport has, in principle, free capacities as far as shipping space is concerned, and I do not think it can be said in general terms that we could make much more intelligent use of these.

Jan Sönke Eckel: That also has something to do with the fact that last year we had a long period of low water. The ships could not carry as much goods as they could in principle. As a result, more shipping space was used, which meant that the shipping space was very well utilised. That is actually different with trucks. There are phases in the case of trucks, there are trucks leading, there are various reasons for this, and there are phases, there are trucks standing around and offering themselves to the market at a favourable price. I believe that this is very similar in inland navigation.

Jan Sönke Eckel: Where I am with you, inland navigation is certainly not yet in the minds of the shipping industry everywhere as it should perhaps be. Inland navigation and ports have the same theme. Over the next few years, we must certainly manage to get the loading industry to discover inland waterway transport even more for itself than it does today. There are industries that are certainly already doing this strongly today, such as the stable industry, the chemical industry and the building materials industry. They are already making very intensive use of inland navigation as a supply option. But there are also other sectors that do not yet have inland navigation on their screens. There is certainly a need to change something. But the same applies to the railways. There are industries in Germany which are to a large extent railway-heavy and there are some which find it difficult. So, you have to ask yourself, why is that so? Do you know the advantages? Or are there barriers? Are there any fears why people say that the truck is perhaps simpler? Then I call them and have dozens of suppliers. I know the mode of transport and that is easier as a dispatcher of a company. Inland navigation certainly has to work on that.

Jan Sönke Eckel: But to say now in principle that inland waterway transport does not make use of capacity is not my view. The question could rather be posed differently. Waterways could tolerate many more transports, but that presupposes that new shipping space comes onto the market, and that in turn presupposes that the shipping industry, also uses these capacities. This can perhaps be seen more from the side.

Jan Sönke Eckel: Yes, then question three: Do you know any contents that are covered by universities within the framework of logistics courses?

Jan Sönke Eckel: Yes and no. Let me say that we as a company should actually know very well what the universities are doing in this area. We know this to a certain extent. I have a colleague in my car who is a few years younger than me, who hasn’t finished his studies as long as mine. So my personal knowledge comes from the 90s, that is certainly no longer the state of things. Personally, I think I know that there have been far more logistics courses in higher education in recent years than there were in my time. I believe that universities have discovered the field of logistics for themselves.

Lukas Klippel: Of course, the question is also what is meant by logistics. If you are targeting inland waterway vessels, then I will tell you from my own experience that I have also studied logistics.
management. That in new German Supply Chain Management, internal logistics, trucks quite clearly, but even the railway is only treated quite rudimentarily, in my opinion.

*Lukas Klippel:* The inland vessel in the general study of logistics, one hears that there is that, one hears that there is the seagoing vessel. Yes, in combined transport this is sometimes mentioned, but I don't think that you really go into it. In my opinion, this is not dealt with in a general logistics course. Now, of course, there are more and more courses of study that are also becoming more specialised. I do not know to what extent your question is aimed at this? We, as a company, are actually still doing the general courses of study and specific specialist knowledge about the modes of transport railways and inland waterways at the moment, and are then being trained in-house.

*Jan Sönke Eckel:* May I ask which degree course you are attending? Do you also study in Bremen or Bremerhaven?

*Nele Albers:* No, I am studying in Groningen in the Netherlands and I am not studying Logistics but International Business and Management. That's why it's very interesting for me to find out, because of course there is no inland navigation in my course of studies, but I would like to know if it still occurs in actual logistics courses of studies.

*Lukas Klippel:* Very little, there are sometimes some specialisations, but it is offered very very little. Unless, of course, you have such a special shipping logistics course, but they are very rare. You can only find such courses at specialized universities.

*Jan Sönke Eckel:* And then, of course, there is always a strong tendency towards maritime shipping. When I think now of the university in Bremerhaven or Elsfleth, I also think that Leer is a logistics course of studies, then they are very much concerned with maritime shipping. Perhaps we should now start one step earlier. What Mr Klippel has rightly said now is one thing, but also in training, when I now separate myself from the studies and now also look at the classic training as a forwarding merchant, even there at the vocational schools, which may well differ from state to state, there is at least hardly anything to do with inland navigation at the vocational schools in our region. This starts with the fact that the school authorities or the school ministries, at least from our point of view, are only working on the subject marginally. Then, of course, one should not be surprised if the trainees, who then often study parallel or afterwards, do not have the subject of shipping or rail in their minds anymore.

*Nele Albers:* Do you think that's a shame as a company? Do you think that this would also have added value for you if more attention were paid to modes of transport?

*Jan Sönke Eckel:* Yeah, definitely, of course. A few weeks ago I spoke again with a large school authority in our region and criticised that. Whether that will change anything is another matter. But we in the office have a great interest in this being dealt with more strongly in training, be it in university studies or in classical vocational training, in any case of course.

*Jan Sönke Eckel:* But of course we are also in demand here. Actually, we have already answered question four. The question was, in your opinion, should additional content be covered? Yes! Of course.

*Jan Sönke Eckel:* Shall we go to five, then?
Nele Albers: Yes, I'd love to. I know that this is a rather difficult question, but of course I hope that you can answer it anyway.

Jan Sönke Eckel: I read aloud because Mr. Lukas Klippel cannot read the questions here right now. What competences do you think are needed to actively include inland navigation as a mode of transport? I believe that, in the final analysis, it is the shipper who decides which mode of transport to use. As a rule, this is the case and then certainly the freight forwarder. In other words, we are actually heading in a similar direction, as we have already said. It must be managed that in the minds of the freight forwarders, that is to say the freight forwarder should normally think neutrally in terms of the mode of transport, but they often do not do so. After all, the freight forwarder is not really the transporter from the ground up. The forwarder organises the transport, but he is not really the one who transports the goods himself. This often happens in practice, yes, but in theory it is not the same. But for me or for us, the shippers, the loading industry, the freight forwarder, their competences must be such that inland waterway transport, lorries and railways exist and offer quite intelligent logistics alternatives.

Jan Sönke Eckel: Yeah, and now the question is, how do you get it right? By drumming up business by we actually do here every day: to convince our customers, potential customers and partners of what is the most intelligent method of working together. That's actually the answer.

Lukas Klippel: So in my opinion, in order to perhaps supplement this again, you simply have to create awareness in the shipping industry. Because why are many things still on the truck, which could actually also be on the ship or on the train? That is also a bit far, if I can now answer provocatively, the convenience of the loading economy. Because, otherwise we might have to adapt internal processes so that the disadvantages, as they may be with less flexibility in relation to trucks, in the railways and, above all, inland waterways, are eliminated. However, in order to compensate for these disadvantages and make the most of the advantages, it might be necessary for shippers to tackle their own internal processes as well, since logistics has become increasingly important in recent years and is also making an impact on shippers and retailers, who actually earn their money in logistics afterwards. I can have the greatest products, but if the logistics behind them are not right, I won't earn any more money. But awareness, in my opinion, must prevail even more clearly. Because if we start to optimize the internal processes of the shipping industry in such a way that the logistics advantages can be used afterwards, I could imagine that there is still some potential to be raised and that it would also be to the advantage of the shipping industry. But I don't think this is always seen, because we very often get the statement, I say the supply chains, these conditions from the industry or from the recipient, they have to be adhered to and must not be changed and we have to build the logistics around them. So the forwarder has to build around it and that's a huge problem.

Nele Albers: Okay, thank you so much for the evaluation.

Jan Sönke Eckel: Okay, then let's go to question six. Often, job-specific competencies are linked to a company's mission, vision and goals. What would you call the goals or mission of the inland navigation industry? At least you have to do that for me, I cannot speak for Mr Klippe now, but please translate.

Nele Albers: Yes, please. So this simply means that companies usually define certain competencies that an employee needs to perform a job. If the company does this very
accurately, then these competencies will be linked to the strategic goals of the company, for example if the company is aiming for growth and so on and so forth, that it's all connected. But if you were to refer very roughly to the inland navigation industry, do you think that there are certain goals that still need to be achieved in the industry? Or where it must develop?

Jan Sönke Eckel: Oh, okay, all right. Partly we have already answered it earlier. If decision-makers in industry or commerce or, I would say in general, in the shipping industry were to regard ships or inland waterway vessels as meaningful, they would have to ensure in their own organisation that their employees are equipped with the competences to use the mode of transport. That, of course, presupposes that there can be a certain amount of effort at the outset, that this has to go into the organisational processes, and I have to change them. I may have to change the existing practice, where I say: well, a lorry is very small, the inland waterway vessel is not. And yes okay, the shipping industry must equip its own employees with the competences, in whatever form, yes of course.

Jan Sönke Eckel: Of course, this again presupposes that we, as an industry, build bridges there or, as the case may be, clearly present the added value that this should bring. I think that this is a kind of interaction. I believe, perhaps to come back to shipping as a mode of transport in general, that it has its strengths, which I believe can also be reflected in euros, but as a shipping industry I must first do something myself to ensure that this succeeds. That also has something to do with the long-term.

Jan Sönke Eckel: It might even fit better on the railroad. If I choose the railways as the loading economy, then this sometimes fails because of the wagons. The locomotive is often not the topic, but the wagons. When I say I would like to drive large quantities from A to B or also smaller quantities, I have to see as a loading economy, which in the travel rail transport company, and I can see this partly similar in the shipping company, I must first offer a certain perspective. I have to say that I am prepared to commit myself to a contract over a longer period of time. That is not the case with lorries, and the loading industry has a hard time coping with it, because that is not the case with lorries and I can fall back on the existing market in the relatively short term, so I do not have to think so much about it. To that extent, in order to answer the question, yes, the shipping industry must provide itself with the organisation, the competences and the possibilities to get involved in inland waterway transport.

Nele Albers: Yes, thank you very much. May I ask you again very briefly, because you have just spoken of competences, if you had a freight forwarder now, do you think that he would have to have a certain knowledge or ability in order not only to know inland navigation, but also to have certain skills in order to implement it in order to use it as a means of transport?

Jan Sönke Eckel: So you mean now knowledge that concerns the general transport?

Nele Albers: Yes, exactly, in order to be able to organize something like this at all.

Lukas Klippel: Most of all, he needs to know who to talk to. He doesn't need the special knowledge about the rules that apply there. That's what the experts are for. I mean, the forwarder is not the expert everywhere who says that I know all about transport now so well that I could do it all myself tomorrow if I had the equipment. The forwarding agent must know that this possibility exists, must know roughly what is possible and what is not, and then he must
actually know where he can get the information or where he can place the inquiries. Then the
experts will tell him very precisely that and that is possible, that and that must be taken into
account. But none of this is witchcraft. In my opinion, there is no simpler mode of transport than
inland waterway transport compared with rail, for example, in terms of regulations and
restrictions. All you have to do is find out whether it works or not.

_Nele Albers:_ Okay, thank you very much. Great that helped me, I wanted to deepen that again.

_Jan Sönke Eckel:_ Okay, what are your personal expectations of future decision makers in
logistics?

_Lukas Klippel:_ Now I'm curious.

_Jan Sönke Eckel:_ We ourselves are decision makers in logistics. But you are probably referring
more to the shipping industry?

_Nele Albers:_ No, I would also like to know what your "new generation" in the industry should
include or what is important to you.

_Jan Sönke Eckel:_ Ah, okay. I just have to think, maybe Mr Klippel already has an answer.

_Lukas Klippel:_ I just didn't quite understand it acoustically. It's about the new generation?

_Nele Albers:_ Yes, that is, the students who are currently studying logistics, who will then be let
loose on the industry, so to speak, in all sectors. What do you expect from them?

_Lukas Klippel:_ Yes, what do you expect from them? One expects an open view, no box thinking,
no drawer thinking and also new ways to go. You notice very strongly that we live in a time that
sounds so stupid, but we actually live in a phase where there are more and more traffic
problems, even partially the traffic infarction threatens. Logistics, if we now refer to port
logistics, is at a turning point at which a great many options have to be tested in order to be able
to transport the pending products. This is becoming an ever greater challenge. The populatio
is growing more and more, the requirements are growing more and more, and so the tasks of
logistics providers are becoming more and more diverse and comprehensive.

_Lukas Klippel:_ If you now ask what we expect from students and future decision-makers as well
as executives, then that's exactly what it should be. They have to be open, they have to break
new ground and they have to be creative. This does not mean that everything old is bad. But
you have to combine the strengths of a conventional system with the strengths of a new one.
And that, I think, is the challenge, the difficulty, but also the appeal that this whole story has and
for that you need people who are flexible enough to think outside the box. That's actually what's
important.

_Jan Sönke Eckel:_ I have nothing to add. I could not have said it better.

_Nele Albers:_ That was also a very good answer.

_Jan Sönke Eckel:_ So yes to number eight, is there anything else we want to add after you haven't
asked? I don't think so, then we would be through.

_Nele Albers:_ All right, thanks for your time.
The conversation begins with a general greeting. Nele Albers introduces Mr. Nölke to the project and outlines the goals of the bachelor thesis. Furthermore, Mr. Nölke informs Nele Albers about the activities of the SPC and gives a good insight into his field of activity.

Nele Albers: Should I just get started or do you have any questions for me? As I said, if you have any questions, please let me know. First of all, this starts relatively general as an introduction. I would like to know what possibilities you see in inland navigation and what advantages it offers?

Markus Nölke: Is this about inland navigation in general?

Markus Nölke: Inland waterway transport is a mode of transport which still has spare capacity. If you look at the modal split, road accounts for 75%, rail for 18% and inland waterways for eight percent. You can see right away that this is somehow very one-sidedly distributed. In Germany we have a fairly good inland waterway network with around 7300 kilometres of inland waterways, i.e. federal inland waterways. There are still free capacities and we think that inland navigation can also be a good alternative to road transport. It may not always be an option, but it is worth checking whether it can be considered. Inland waterway transport is CO2 friendly,
low-noise and relieves the roads and infrastructure. One can actually say that the entire motorway in Germany is a single construction site. Above all, the bridges are heavily loaded, overloaded. Shipping can simply make a contribution to relieving the infrastructure. That is good for the environment and good for traffic safety. As I said, inland navigation is relatively noiseless. At the same time, this is a bit of a problem for inland navigation that it actually does its job reliably and noiselessly and is, therefore, not at the top of many people minds. That has now changed a little during the low water period in the summer of last year, I think everyone in Germany now realises what problems it causes if inland navigation cannot function reliably. The oil reserves had to be tackled. There were delivery bottlenecks for the large German industry and for large shippers. We had big problems at ThyssenKrupp which gets 40000 tons of iron ore a day via inland shipping. But if this chain is then interrupted, they are not able to produce steel anymore.

Markus Nölke: In this respect, what happened last summer was actually a very good wake-up call to say, "Hello we're here and now you see what you don't see otherwise", unless you're a supplier on the Rhine or something. But now there are other times when you can see the importance of inland navigation and the problems it can cause if it doesn't work.

Markus Nölke: We believe that even more cargo should be transported by inland waterway because, as I have just said, it is environmentally friendly in terms of CO2, and there have also been discussions about nitrogen oxides. It has to be said that inland waterway transport still has to come up with something, of course, just like all other modes of transport. After all, the major objective is to decarbonise the world economy and, of course, to decarbonise freight transport. Of course shipping has to do something about this, but a great deal has already been done in recent years. And regardless of this, the ship is still the most environmentally friendly mode of transport today, because it can transport a lot of cargo, unlike trucks.

Nele Albers: Okay, thank you very much. You have just mentioned that inland waterway transport could mostly be a matter of ignorance or an image problem. But in your opinion, why else could it be that inland navigation is not yet fully exploited despite these advantages?

Markus Nölke: It is also the case that inland navigation transports about 220,000,000 to 230,000,000 tons of cargo per year, due to the period of low water levels, it was almost 200,000,000 tons. The road transports 6.6 billion tons. 80% of the cargo volume of inland navigation refers to the Rhine and the Rhine area, to the West German canal network. This means that inland navigation runs primarily here. That must be said quite clearly, about the Rhine. This is quite simply because the Rhine offers very good opportunities here. I have no locks there, I have no bridges there. Well, now you have problems with the low water. But in principle I can operate inland navigation on the Rhine very well and without restrictions, and the West German canal network is also very important, because coal-fired power stations that are supplied by inland navigation are still located there. That is why canals such as the Wesel-Datteln Canal and the Rhine-Herne Canal, which are perhaps not so well-known but also transport very large quantities, are used to supply coal-fired power stations located there. That's another topic, coal will disappear at some point - of course it's also a large load carrier for inland navigation.

Markus Nölke: But that's the topic of perception, it's the fact that inland navigation primarily has a great perception where it is present, and that's predominantly in the Rhine area. If we take the Elbe, things will look different there. The importance of inland navigation for the German seaports is rather small. In the port of Hamburg, inland navigation accounts for almost ten percent of hinterland traffic.
Markus Nölke: In the case of containers, the share is more likely to be 2.7 per cent. So of course that's very low. This is certainly one of the reasons why inland navigation is not that present here and is not perceived as such, because trucks are still very cheap and very flexible at the end of the day. The truck is a competitor on the one hand and it takes a lot of overcoming to leave the old well-trodden paths behind. It's hard to do that. And then finally there is the transport decision, which is still made about the price. And the truck is simply very cheap. But inland shipping can also be very attractive in terms of price.

Markus Nölke: That's why we advertise it, even to shippers. If, for example, a shipper makes an invitation to tender or something like that, then inland waterway transport should be taken into account whether, at the end of the day, transport is carried out by inland waterway, that is something different. But at least take them into account, try to find out whether inland navigation might not even be of interest to you in terms of price. It is then still too one-sided, too quick to consider the lorry from the outset without examining the alternatives. And that is why we are here, among other things. We are only a very small organisation in order to promote the fact that inland navigation, for example, is taken into account in invitations to tender. This also applies to short sea shipping. Because there are precisely these good reasons, such as the environment, the relief of the transport infrastructure and so on and so forth.

Nele Albers: Okay, thank you very much. now let's go into detail. You have already told me that your company's third string is focusing on people whose career has just begun.

Nele Albers: Do you know the contents that are still covered by the universities in logistics courses? Do you know what is taught there?

Markus Nölke: No, the universities are all independent.

Markus Nölke: They have their framework curricula but the contents, the focal points they determine themselves. And I would say the vocational school in Duisburg is more concerned with inland navigation than the one in Flensburg.

Markus Nölke: Of course, they always adjust their content to what is on their doorstep. I remember we went to the vocational school for forwarding agents a few times, where forwarding agents are trained in Flensburg and I talked to the teacher about the contents and so on. And then she also said that inland navigation is not as relevant for them. Well, in Flensburg there are mainly small to medium-sized forwarding companies - first and foremost all truck forwarding agents. And then I said to her: see, this is exactly why it is good when people hear something about transport possibilities that they don't have on their doorstep.

Markus Nölke: And apart from that, a freight forwarder often also moves cargo, regardless of where he has the office.

Markus Nölke: And in this respect we always recommend to say: look at not only what is right in front of the door, but also beyond it. But it is the same. We once superficially commissioned it to deal with curricula, but that's very complex. Because there are framework curricula and of course everything is included. But then all lecturers can determine the focus individually. And it is the case that inland navigation has no examination relevance and therefore does not take place in such a way in the classroom. Of course the teachers try to cover what is relevant for the exam. And that is not good, of course, but inland navigation and also Shortsea, which always applies to both, should also have stronger examination relevance, because then it would be treated more in depth in preparation.
Nele Albers: First of all thank you and now my question would have been whether in your opinion additional content should be covered? Since you as an organization are also doing this yourself with your lectures, I am assuming a strong "Yes".

Markus Nölke: Yes, of course above all the multimodal idea should be conveyed more strongly. After all, everything is still very much aimed at the modes of transport, and it is primarily trucks that are at stake here, and there is still a bit more to be done by rail. In the shipping sector, there is actually less talk of coastal shipping than of global shipping. In our opinion, therefore, the multimodal idea or the combination of modes of transport should be emphasised more strongly. That would actually have to find a much wider place there. But it is more a matter, I would say, of conveying pure factual content, e.g. transport law and what I do not know. I am also a trained freight forwarder, that was a long time ago for me, this multimodal idea and the reference to free capacities, even during training, is very important. Then it's also the case in training that it depends on which company you do your dual training in, which company they work for. I say that if someone does his apprenticeship at Kühne und Nagel, then he gets to know air freight, he gets to know shipping, he will actually get to know almost everything, because they have everything. But of course there are also companies that specialize purely in the truck sector. Of course, it would be even better if at least at the vocational school you could learn more about other modes of transport. Because what I said at the beginning, if people can get the impression that it's not so important, I don't hear anything about it and I don't get tested in this area, then I put it all in the back of my mind.

Nele Albers: Yes, that is very true. We have already referred a little to the fact that you said that it is precisely this multimodal idea that needs to be dealt with more, that several modes of transport could also be used in transport concepts. For my project, it is of course most important to me to find out which competences future decision-makers actually need. Is there anything else they need to know, in other words, what skills or knowledge do they need to have so that they can have inland waterway transport operators back on the radar and also be able to use them?

Markus Nölke: Could you give me an example?

Nele Albers: Let me now give you an example that does not relate to inland waterway transport but is a competence. A competence would be, for example, the ability to analyse competition for someone who, for example, has studied business administration.

Nele Albers: Then it would be his ability to carry out on-site visits or Internet research. He would need to know how to identify his competitors and he would need to have a focus on details.

Nele Albers: That would be such a competence that would be composed like that. I would be happy to give you a second example, if that helps you.

Nele Albers: If we now had the competence, e.g. the ability to select a suitable candidate for a job, then I would need the ability to conduct an interview. As knowledge I would need to know what the position involves and what they need to be able to do and my skill would be to have a professional attitude towards the interviewee.

Nele Albers: And that's how it would come together and that's the main question that I or we ask ourselves at bremenports.

Nele Albers: What competences are actually needed in inland navigation?
Markus Nölke: Yes, well, I am now a bit focused on the training of the forwarding agents, because the forwarding agent organizes a transport.

Markus Nölke: The forwarders organize and are not necessarily carriers. They don't necessarily have their own trucks or anything. Especially when I am just this pure organizer, then of course I have to have competence for all modes of transport and also the connection of the modes of transport.

Markus Nölke: That means I first have to know what the basic possibilities are.

Markus Nölke: Of course, I need to know the market. Who offers what? Who offers which services?

Markus Nölke: You must then also know how to help himself, so to speak, that also research. Unfortunately, this is also an issue that we are always concerned with in many groups, transparency.

Markus Nölke: Transparency is a very big issue.

Markus Nölke: Wherever we are sometimes thinking about it, how can we make shipping more transparent somewhere? The freight forwarder is then also required to organise this for their customers. We would also like to see customers approached proactively and say there are alternatives, there are new possibilities that should be examined. Whether or not they will be implemented in the end is another matter. We also had some light discussions where a truck entrepreneur could say, "you are against us you don't want something to be transported by truck". That's of course nonsense, the truck is always needed, but the truck has nothing to gain from it if it can't get through and is stuck in traffic. That's also a big topic in the meantime, I just read it again this morning, the trucks stand at the terminals at the port of Hamburg for three to four hours and you don't get paid for that, the customer doesn't pay for it. Let me say that even the forwarders, the truck operators have to think about what the alternatives are, and if they can do it the same way as before. And that is actually the greatest competence a freight forwarder must have. It is precisely that all modes of transport are present and that they know their way around the markets, who is active and whom they can ask.

Nele Albers: Great, thank you very much. Now you've mentioned some competencies, I'm very happy about that.

Markus Nölke: So the knowledge of the market, earlier vocational school teachers have always said the forwarder is so to speak the architect of the economy. They bring people together and they can only do that if they has the appropriate knowledge of the market. And then it's just not good if someone in Flensburg doesn't know what opportunities inland navigation offers in principle.

Nele Albers: Yeah, you're right about that. I can well understand that. There must be a basis formed first of all.

Markus Nölke: Yes, exactly.

Nele Albers: For the next question, I have to go a little further. In the course of my research, of course, I first dealt fundamentally with what competencies are, how important they are for a profession. And now it is often the case that competences are not applied to an entire industry, as we are currently trying to do, but to a specific occupation. And if a company that really does
a good job, then the competencies are not only linked to the profession, but also directly to the
company's strategy and goals.

*Nele Albers:* And now I would still like to know from you, because you also do a lot with
promotion, are there certain goals that the inland navigation industry would like to achieve or
should achieve?

*Markus Nölke:* So now you're talking about the industry itself?

*Nele Albers:* Yes, exactly the industry itself.

*Markus Nölke:* Yes, well, the industry is facing a major change. After all, inland navigation is a
very traditionally cultivated industry and the big challenge is that... After all, inland waterway
transport is actually a major activity in the bulk goods sector, which is the core of inland
waterway transport. Inland navigation is also subject to change, and it must become more
modern. It is just that an inland waterway vessels are very durable.

*Markus Nölke:* This goes on for decades, 60 years or more. It is also a great challenge that inland
navigation must become more modern, to meet the environmental requirements in the future.

*Markus Nölke:* We cannot just rest on our laurels and say that we are the most environmentally
friendly mode of transport, but that the great goal for everyone is decarbonisation, and that
applies to everyone! This also applies to inland waterway transport. And it must change
radically, and inland waterway transport in general must also ... I will say it flatly, in the past the
cargo came to inland navigation on its own. At that time, the companies fought each other, the
competition. But the cargo was there, and that is changing. Coal will disappear at some point,
but it is a very large part of the total volume of inland navigation and at some point there will
no longer be any coal transports. This means that inland navigation must also look for new
cargoes, new business fields and must also have a stronger presence on the market and
advertise for the cargo.

*Markus Nölke:* And that is a big change and on the one hand there are big modern shipping
companies and on the other hand there are a lot of particular, like a family business where the
family drives and maybe they are still united in cooperatives. But inland navigation also has to
reorient itself and has to become even more modern and has to look for new cargo fields,
because certain types of goods will simply break away at some point. I am thinking in particular
of one area in which inland waterway transport actually has very good growth; in container
transport it must participate much more in container hinterland transport.

*Markus Nölke:* They already have two million containers per year that are transported by inland
waterway and they also have good growth rates, but this simply has to become even stronger
because truck traffic is growing disproportionately. And that is where inland navigation is called
upon to move in the direction of the future: more modern propulsion systems, more modern
engines, environmental friendliness, and to see how cargo losses can be offset, for example by
eliminating coal, and how new cargo can be acquired. And oil transports will also be eliminated
at some point, because crude oil will no longer be a raw material.

*Markus Nölke:* And of course, inland navigation lives very much from oil transports, it is also
good at gas transports. We also say that heavy goods transport should be handled more by
inland waterway, as there is too much on the roads. I would also like to say that this will not
save inland waterway transport, but one thing comes after another. We must participate much
more in [...] transport. Heavy transports, those are points where you could start. Inland
waterway transport must be much more proactive in its approach and also advertise for cargo. That is a bit, yes, you have to say, that is such a change and it will decide how much success and what significance inland navigation will have in the future.

Markus Nölke: In general it is very traditional and they have been driving with heavy oil for a hundred years and that is just not possible anymore. And now there are new things like LNG and so on and so forth.

Markus Nölke: So there is a lot of change and yes, especially in inland navigation due to the change in cargo.

Nele Albers: Do you think that this change is just beginning or is inland navigation already lagging behind?

Markus Nölke: I'm telling you, it's not a thing, it's a long time period. No, but the change is going on, I wouldn't say now that it's lagging behind, because the insights are already there.

Markus Nölke: But of course, the implementation is always different. And here I have to assert myself and compete with the other modes of transport, which are also important partners again.

Nele Albers: So it's simply a lot about working together and not every industry on its own, right?

Markus Nölke: We'd recommend that, for example. Well, not everyone sees it that way, but I would recommend it.

Nele Albers: Well, just so I'm getting this right.

Nele Albers: Then I would like to conclude by asking you what your personal expectations are of future decision-makers in logistics? To forwarding agents who are now in training, to students who are currently sitting in the classroom.

Nele Albers: What are your hopes for the future?

Markus Nölke: So we always say, the shift starts in the head and the multi modality, really the broad thinking, not the restricted thinking is important. Let me give you a practical example, there is a large importer, I will not mention the name now, who imports thousands of containers from Asia to Germany, including Hamburg.

Markus Nölke: And they have a central location that is near Magdeburg and there is an excellent inland waterway connection. These containers go from the port of Hamburg to Magdeburg by inland truck and this is handled by the company's logistics subsidiary. I once had a conversation with a managing director, I was also admitted. And I just wanted to advertise whether they don't want to handle at least a part of these transports by inland waterway. Or at least I would like to hear why this is not possible.

Markus Nölke: And then I arrived there and then he said, "Yes, how long does the inland ship from Hamburg to Haldensleben take?"

Markus Nölke: I said, "yes, three days" and he asked me, "yes and how long does the truck take?" I said, "I don't know, depending on the traffic situation, six hours or so". "Yes, you see, that's why we don't do that," he answered.
Markus Nölke: First of all, the classic question: Why should we transport for about three days?

Markus Nölke: And then we say, "Yes, if that's the way you see it. Of course the truck is much faster. But just think, what we don't understand is that even those people don't see it that way. Take a look at the entire supply chain, you're ordering something in Asia. Then it's produced. Then it's transported to some port. Then it's on the ocean-going ship for weeks.

Markus Nölke: Then it arrives at the port of Hamburg sometime. The goods are on their way for four months from production to arrival at the port of Hamburg. That's at least how long the process takes.

Markus Nölke: Now the container arrives at the port of Hamburg and suddenly hours are decisive for how the further transport is carried out. Although measured against the entire supply chain, from the ordering process to the customer, this has no time relevance at all. And then he said, "yes, if you see it that way, it's something else".

Markus Nölke: And that's how we'd like it to be seen.

Markus Nölke: I'll say this holistic thinking.....

Nele Albers: Hello, excuse me. I just didn't hear you anymore..

Markus Nölke: I could hear you, but now it's going very well again.

Nele Albers: Yes, now I hear you again.

Markus Nölke: I don't know now where you couldn't hear me anymore. I actually wanted to say this holistic thinking, not always this cut off thinking.

Markus Nölke: For example, we start to think when the container is in the port of Hamburg and start searching how it will be in two hours at the recipient, but that the entire transport chain is planned. So that a somewhat inland waterway vessel has no effect at all, at least no relevant effect anymore. It's all right.

Markus Nölke: This is what we would like the decision makers to think beyond their desks and look at the entire supply chain not only, so to speak, work their fingers to the bone and say, come, let's try to get the best, but also take the whole way into our sights.

Markus Nölke: And also have the courage to break new ground. It is of course the case that the processes in the company, for a manufacturing company or an industrial company that sells something or that moves goods that there is the sales department in the company that brings these goods to the customer. And then there is logistics, which moves the goods. But we are also of the opinion that the importance of logistics is often still suboptimal. Also in companies, so to speak "logistics costs money".

Markus Nölke: The sales brings the money and then it is like this, the logistics manager comes along, who perhaps has exactly this way of thinking and says, Yes, I want to break new ground. So that's what we've found in practice from time to time. I deal with alternatives and I would also like to try out alternatives. But then it always has to be coordinated with a lot of people in the company, he can't decide for himself, I'll do it differently now, because something changes.
Markus Nölke: Instead, he has to coordinate the process, then he has to coordinate it with the sales department, because, for example, the customer, the recipient, no longer receives the cargo in the truck but in the container.

Markus Nölke: This could mean, it has to be adjusted, if the customer says: “Well, I have no possibility to unload by the stern, I need a truck to be unloaded from the side because our storage capacities require this. I cannot unload containers, so please come with a usual truck instead.”

Markus Nölke: This needs to be put to a vote. Then it is often the case that the sales department says: I have to talk to my customer, we want to change something. Then the customer says: You want to change something, why do you do that? You certainly have a cost advantage. Then we have to talk about the conditions again. And then it’s often the case that people say, oh let it go the way it is, that’s how it works. That’s how it works. And why do we now want to take the risk of trying something new, always with the danger that it won’t run so smoothly at the beginning, that the customer starts to question something: why do you do that, you have an advantage, where is our advantage? So it can quickly happen that people say: "Let it run like it is, just like it has proven itself over many years. And of course this is associated with a certain risk and there has to be a willingness to break new ground.

Nele Albers: I have to ask you a question now, as Mr Stemmler has already mentioned that risk management might be an important competence.

Nele Albers: Would you say that risk taking could also be a competence that would be needed?

Markus Nölke: Yes, controlled risk-taking, certainly. Yes, you have to be very careful with the term, of course, but it is certainly one of them.

Markus Nölke: You also have to have the will to change, because change comes at some point. It’s always the question, do I change voluntarily or am I forced to do so? And then I always say, rather voluntarily.

Markus Nölke: I mean, everyone says yes: we are innovative, modern and digital. Everyone is talking about big words.

Markus Nölke: In practice, however, in the long run it is the case that we drive along the old paths and continue along the old roads. But that doesn't fit together, because when a company says we are modern and we are innovative. Then you also have to go new ways, because everything is associated with a willingness to take risks.

Nele Albers: You’re right about that. Okay, thanks, we’re through with the questions so far. Is there anything else you would like to add? Something I didn’t ask for?

Markus Nölke: No, not for now. I will take a brief look, we have now submitted a six-point model in our company for the revision of our activities. The one thing I already said, advertising for professional fields of inland navigation, port logisticians, that’s what we’re doing now via job fairs, that’s what we’re testing now. Then it is important to achieve a higher relevance of inland navigation and coastal navigation in the curricula and that it becomes examination relevant. That is, of course, a matter for the Ministries of Culture, because they are all based there. That is not in the hands of the Minister of Transport. Then we would also welcome the development of e-learning modules. That is what bremenports is trying to implement through the project. In order to create low-cost courses for vocational schools and universities.
Markus Nölke: I've been told the teachers are, so to say, lazy. But they also have their way and their plans. And you have to make it as easy as possible for them. To be able to access new content and integrate it as easily as possible. If they have to work it out themselves then nothing happens and I can understand that. Such e-learning modules could help. We could imagine something like that ourselves. Yes, then the guest presence at educational institutions, that's what we're already doing. We also try to integrate this, we have trainee positions here and also in the context of advertising for job profiles we can imagine the presence at pre-vocational training years where people sit who do not yet have a degree or do not yet know what they want. One could possibly win them for port logisticians or for inland navigation.

Markus Nölke: What we would also like to see, of course, because this topic training, is of course also very sexy, there you always have a lot of sympathy on the side, but it is so that just a lot of people do something for themselves. And it doesn't help. That's why I also see such projects, I don't see what bremenports does critically now, but there are dozens of others who have done something before. All of them are doing it themselves and the whole thing has to be somehow concentrated in order to achieve a higher impact. If everyone is doing something on his own then it's always just a drop in the ocean and that's why we would wish, especially when it comes to the development of e-learning modules, that this would happen in a larger circle, because hardly anyone knows that bremenports does that.

Markus Nölke: We at SPC always see this nationwide, and what helps the vocational school in Stuttgart to do something they don't even know.

Markus Nölke: That's always the case where everyone often has to muddle around on their own because they somehow received money from a project or some kind of grant. But the whole thing simply has to be thought and implemented in a larger context, otherwise the sphere of influence is very minimal.

Nele Albers: That's right of course.

Nele Albers: Have you ever dealt with e-learning? Is there anything you would specifically say that is particularly helpful in terms of learning materials?

Markus Nölke: We have dealt only so far with the fact that we would like to implement something like this but unfortunately [...], it is now on 14 May by Minister Scheuer the topic Masterplan inland navigation presented and there was the topic training also an area where we are mentioned.

Markus Nölke: In the course of that, we would have wished for some money to do that. But unfortunately, this is not going to happen now. In this respect I will not go into depth here, because it makes no sense if the realization is in question.

Markus Nölke: But there would be a lot of good opportunities to develop interesting e-learning modules, which would really be divided into blocks and then made available to the educational institutions to use.

Markus Nölke: I say, the contents and all that would be just a collection of familiar. That would not be the problem.

Markus Nölke: But at the end of the day it is connected with costs and if you don't know where the money comes from, because we're not talking about project funding that's gone sometime, which is why many projects die, but we're talking about a permanent implementation.
387  *Nele Albers*: Okay, so that's it for now from my side.

388  *Nele Albers*: Thank you.
H.8 Interview Transcript Andrea Vasterling-Will

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1. General welcome and brief explanation of the contents and objectives of the project before the interview begins.

3. **Nele Albers**: The first question is, of course, very general. But I'm still very interested in that. What possibilities do you see in inland navigation at all?

5. **Andrea Vasterling-Will**: Now of course you have to take a look at our position, our function here.

6. **Andrea Vasterling-Will**: As the economic and port authority in the state of Bremen, we are naturally interested in strengthening the port and the economic location, and this also includes, with regard to the ports, that the hinterland connections should also be expanded, and the waterways improved, because there is still free capacity on the waterways. The roads are full, full of trucks, and the railways are also sometimes tight. That is why my focus is on waterways. Here in the authority, I am the officer responsible for inland waterway transport matters. I am also responsible for port security. These are two completely separate areas of responsibility. I am the contact person for the inland navigation sector.

14. **Andrea Vasterling-Will**: My task is to ask questions about the needs, problems and worries and to stay in contact with the industry and to pass this on in discussions with the federal government, which is also responsible for the development of the waterways and the infrastructure. Then, of course, to answer all sorts of questions from politicians. There are always questions, especially now, when there are small enquiries about autonomous inland waterway transport, so our main aspect is to advocate an efficient transport network and thus an expansion of the rivers. This should strengthen inland navigation and improve the transport of containers to the port of Bremen/Bremerhaven.
Andrea Vasterling-Will: That's our main concern. I don't know whether you have followed the Mittelweser issue a bit, the expansion of the Mittelweser, as I said, the federal government is responsible for the expansion of the waterways according to the Basic Law. But Bremen was contractually obliged at the time, in the 1990s, to contribute one third of the construction costs to the expansion of the Mittelweser.

Andrea Vasterling-Will: Because Bremen still had really good money at that time. Today, that has turned completely into the opposite.

Nele Albers: Why? If I may ask that question?

Andrea Vasterling-Will: At that time, the federal government was probably not in such a good financial position and Bremen offered to participate, hoping that the federal government would then invest more in the Mittelweser. That's what the federal government did, it worked, it worked out well. Until the whole thing then turned around somehow, also to the effect that the whole building project was very delayed by lawsuits and so on. In the meantime, the costs have risen tremendously and everything that was estimated at some point in time and approved by the Senate at that time in terms of Bremen funds was no longer sufficient. Bremen had a real problem with that. In the meantime, we have succeeded in negotiations with the federal government that Bremen has withdrawn from this administrative agreement. The lock in Minden was opened in 2017. In agreement with Bremen it was agreed that with the release for traffic the larger ship units can navigate the Middle Weser and thus the administrative agreement should also be terminated. Bremen is no longer involved and has so far invested around 22 million euros in the expansion. Everything that is still to come, further improvements and expansions will be covered by the federal government at its own expense. Other important points in Bremen concern the improvement of berths, dredging, equipping berths with shore power and water supply facilities. So everything that contributes to the improvement of inland navigation.

Nele Albers: Do you believe that inland navigation is becoming more or that it is really being used much less now? Or does inland navigation just have free capacities?

Andrea Vasterling-Will: In our opinion it remains rather constant in Bremen. The current transhipment figures and ship calls confirm this. Compared to the previous year, both ship arrivals and cargo increased.

Andrea Vasterling-Will: If, however, the power plant or the steelworks no longer need so much coal, then that is a structural problem.

Andrea Vasterling-Will: But otherwise it is a reliable and environmentally friendly mode of transport.

Nele Albers: Okay, thank you very much. You've already mentioned it a bit.

Nele Albers: In your opinion, what is the biggest problem, why has the capacity not yet been fully utilised?

Andrea Vasterling-Will: Yeah, that's exactly what you said at the beginning, it's too little known. So its relevance should be emphasized more clearly.
Andrea Vasterling-Will: It is always said that it is a rather inconspicuous mode of transport and perhaps inland navigation is too inconspicuous. It is relatively low-noise and low-emission, reliable, and thank God it does not cause spectacular accidents.

Andrea Vasterling-Will: You can see the ships cruising so nice and cosily and it is probably not so well known what they can move and what distances are possible. This should be emphasized in any case. And on the other hand a reliable infrastructure is necessary. Well this problem with the low water or also high water, ice drift we did not have this winter now so much. Of course this also leads to restrictions. These are challenges that you have to face again first, you don’t know if it will be like this again this year. There are already some signs of this during the drought. But also the infrastructure, for example the locks, are partly very vulnerable. This also applies to the new locks.

Andrea Vasterling-Will: The lock in Dörverden, which went into operation at the end of 2013, failed at the end of 2017 and was closed until April 2018. This is a disaster for shipping. Fortunately, the small old lock was still in operation. But the old lock was not designed for a large motor vessel and if a GMS had been there at that time, it would have been trapped, it would not get out again. Such things then also deter the economy.

Andrea Vasterling-Will: Word gets around fast, and it just doesn’t work. We demand from the federal government that such failures be corrected as quickly as possible. Disruptions must be rectified as quickly as possible. The systems must work reliably, and we must be able to rely on them so that this mode of transport also has a chance. There are many old buildings that will soon be a hundred years old.

Andrea Vasterling-Will: As long as there is no reliability, the potential of inland navigation cannot be fully exploited.

Andrea Vasterling-Will: That is an important part.

Nele Albers: I get your point.

Andrea Vasterling-Will: Well of course and everybody always says it, as soon as the load is gone we won’t get it back and someone who has had such a bad experience once won’t trust inland navigation again.

Andrea Vasterling-Will: An important step, however, is also the abolition of the channel levies as of 1 January of this year. Bremen has long demanded this from the federal government. Because on the large rivers with the highest traffic volume, e.g. the Rhine, a tax exemption exists and the North German waterways, where rather less is moved, taxes occur.

Nele Albers: That's not beneficial.

Andrea Vasterling-Will: Exactly, and that is unequal treatment.

Andrea Vasterling-Will: That’s in the past now. That has been abolished.

Nele Albers: And this occurred only this year?

Andrea Vasterling-Will: Exactly, since the 01.01.2019.
Andrea Vasterling-Will: Yeah, and the SPC might tell you something more. The Short Sea Shipping Inland Waterway Promotion Center.

Nele Albers: Yes, I have already spoken to Mr. Nölke.

Andrea Vasterling-Will: He's also making a strong case for this waterway system to become better known. The SPC also visits vocational schools and universities.

Nele Albers: Exactly, he said that they want to expand and be more present also with the young ones.

Andrea Vasterling-Will: Yes, those would be the main points, the awareness, to make the advantages of inland navigation known at all.

Nele Albers: Great, thank you very much. Those are very good points. Then I would like to get back from this rather broad topic to my studies.

Nele Albers: We have already talked about it briefly, but do you know anything about the contents of the logistics studies?

Andrea Vasterling-Will: Less actually, so I have now indeed looked at it on the Internet.

Andrea Vasterling-Will: Well now I just read it but in general I have no points of contact with it.

Nele Albers: Do you think that additional content should be covered, assuming that it is not yet so integrated? Do you think it makes sense to tackle the problem outside of university?

Andrea Vasterling-Will: I could imagine that.

Andrea Vasterling-Will: It would certainly be desirable, as you also said, to have an equal view of the modes of transport for the course of study, because you also said that the individual modes of transport are practically non-existent. They are only mentioned once, but they really should be treated equally with all the advantages and disadvantages at university. And then perhaps it would also be useful if experts who are involved in this could be on site and give a little insight to students.

Andrea Vasterling-Will: But nevertheless, I can also imagine that bremenports could certainly take over a part of it. I had seen by chance that the Schifferbörse Duisburg also offers further training, Quinwalo. Are you familiar with that? That stands for Inlandwaterway Logistics qualification. It's a course that's offered and ends with a certificate.

Andrea Vasterling-Will: When you get a little inspiration, you come across some things.

Andrea Vasterling-Will: These are points that go in the same direction.

Nele Albers: Yes, exactly.

Andrea Vasterling-Will: Because many also realize that too little is being done or that this is not being sufficiently publicized, these points will then also be taken up by other sides.
Nele Albers: Yes, thank you very much. I am sure you have already seen the question and I have just mentioned that it is specifically about competences.

Nele Albers: Do you think of any competences that a young person needs now when he or she becomes a future decision-maker in logistics in order to include inland navigation again?

Andrea Vasterling-Will: He or she would then have to have practical knowledge, knowledge of the advantages and disadvantages of inland navigation as well as of the other modes of transport.

Andrea Vasterling-Will: He or she needs to be able to judge. I think he or she should have an environmental awareness and a quality awareness also plays a big role. And it would also be important to know who I have to address and when. Who is important to me? What do I need for contacts? To have these contacts in the scene, that's what I think is also very important.

Nele Albers: Do you think that one needs any other knowledge to include inland navigation than one would theoretically need with other modes of transport?

Andrea Vasterling-Will: Special knowledge? I don't think that any technical things are absolutely necessary, because there are other people who take care of them.

Andrea Vasterling-Will: It is simply important to have contacts so that you can ask how long it will take you for the transport.

Andrea Vasterling-Will: In what time can we do this? Where can I find out something about the costs or the cost structure at all?

Andrea Vasterling-Will: So to know the advantages and disadvantages.

Nele Albers: Okay, great thank you. The next question I would like to explain a little bit. Before I even started on the topic, I obviously looked at what kind of literature there is on the topic.

Nele Albers: And especially with regard to competences, it is actually more the case that competences are defined for a specific occupation and not, as we are trying to do here, very roughly for an industry to determine what competences are needed.

Nele Albers: And companies often do this by tying their competencies not only to the specific profession, but also to their strategy if the company wants to grow etc. pp. The competencies are directly aligned so that people who possess these competencies can achieve the goals of the company.

Nele Albers: Do you believe that there are certain strategic objectives for inland navigation that should still be achieved?

Andrea Vasterling-Will: It is difficult to say, the industry describes itself as being environmentally friendly and reliable, and I also believe that if these objectives are important for a company, that is to say this whole green sector, then sustainability could also mean that it could certainly be worthwhile working on inland waterway transport.

Andrea Vasterling-Will: The future logisticians who will then be employed should have environmental compatibility and sustainability in mind. Ultimately, it is clear that profitability is
somewhere at the forefront of every company. But I also think that in the future these will be
the points that can be used to score points, i.e. environmentally friendly industries in particular.

Nele Albers: Now you have already mentioned that sustainability is also a very important topic
in general.

Nele Albers: But your personal expectations of students and people who are still in education.
What do you expect from them in the future as managers?

Andrea Vasterling-Will: Personally, I believe that increased environmental and sustainability
awareness should play a significant role in finding economic solutions. This decision then, that
one can or must act flexibly and find flexible solutions in order to adapt to the changed
framework conditions, such as high and low water levels.

Andrea Vasterling-Will: That’s exactly what I wanted to have mentioned here, but the entire
logistics industry must also make greater efforts to recruit skilled workers.

Andrea Vasterling-Will: After all, this is also a very important issue, the shortage of skilled
workers. Because what is the use of an inland waterway vessel if there is no one to move it
afterwards?

Andrea Vasterling-Will: We haven’t got that far yet that they could all drive on their own. There
is all still a long way to go.

Andrea Vasterling-Will: But these are all considerations that come along (because of the lack of
skilled workers). So this will also remain an important topic and become even stronger and
therefore also the responsible persons in the logistics industry have to deal with it.

Andrea Vasterling-Will: This applies to all modes of transport.

Nele Albers: Wow, now we were so fast.

Andrea Vasterling-Will: Too fast?

Nele Albers: Not too fast, but is there anything else you’d like to add?

Andrea Vasterling-Will: No, thank you, that has been very extensive.

Nele Albers: Thank you very much for your answers and for your time.
H.9 Interview Transcript Sebastian Poser

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<td>Sebastian Poser</td>
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<td>Nationality</td>
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<td>Occupation</td>
<td>Branch manager tankers in the shipping company Dettmer</td>
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<tr>
<td>Working Experience</td>
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<td>- Long-time active as tugboat and push boat driver</td>
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<td>- Afterwards change to the distribution of tanker shipping and the disposition of employees and ships.</td>
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<td>- Today he is authorized signatory and part of the management board</td>
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1 Greeting on the phone and short introduction between Dr. Stemmler, Sebastian Poser and Nele Albers. In addition, Mr. Poser was given an overview of the project and its objectives.

2 Nele Albers: Then I’d like to start in general. What possibilities do you see in inland navigation?

3 Sebastian Poser: That’s a very complex question. In inland navigation, it is first necessary to distinguish a little between the types of cargo that need to be transported, for example between tankers and dry cargo ships.

4 Sebastian Poser: We know, of course, that in tanker transport, for example, last year during the low water period, it even led into politics and into the news, because then petrol stations could no longer be supplied. This is, of course, an area in which inland navigation plays an incredibly important role. But the ordinary citizen and the politicians do not even notice this. They do not know what is happening there.
Sebastian Poser: So just supply issues in large quantities. Then we have the subject of dry cargo shipping and container transport. There is now redundancy in the truck sector and also in the rail sector. It is relatively easy when there is a high or low water situation. Then the load migrates relatively easily onto the road.

Sebastian Poser: This means that the relevance of inland navigation is already there and it now transports 230 million tonnes per year. That is a huge amount and it has been at about this level for years. There is no major growth and no major reduction in the total volume.

Sebastian Poser: I consider inland navigation as such to be extremely important in order to keep the efficiency of the inland economy running at all. Because we are an industry that works in the background but is extremely important for the big industries. There are extremely many supply contracts, which we also have or other large inland shipping companies. Without them, a relatively large number of power stations, manufacturing companies and large-scale industry would have a huge logistical problem if inland navigation did not have this relevance.

Sebastian Poser: Unfortunately, inland navigation does not appear in the public image at all. So the normal person does not know this topic at all, he or she finds it then very romantic when he or she is somewhere on the Rhine and an inland waterway boat passes by. In recent times, however, we have also been under relatively strong pressure, because the conversion and retrofitting of clean engines is an issue, which strangely enough is currently being raised against inland navigation. There are studies that came out somewhere a few months ago; it was even big in the mainstream media, like in the Spiegel or die Welt, that an inland navigation vessel is not environmentally friendly.

Sebastian Poser: And then you sit there and wonder who commissioned this study. Why is that so? Why is there now a hunt against inland navigation, which in principle is completely calm? Of course, inland navigation also consumes oil in the engines. But these are mostly engines, they are still in perfect working order, they will last another ten years. Why throw them away now and invest a lot of money in new machines? These are the topics that move you in this area at the moment, and then the next topic is certainly the infrastructure, which is also at its limit.

Sebastian Poser: One is the channelled system in Germany, which is actually relatively good from the geographical point of view. But the buildings, the locks, the quay walls and so on, they are on a very difficult level meanwhile. Because little has been invested there in recent decades. But as is the case today, if you have a few major measures in mind, then it all takes decades until something is achieved there. Then we have the unspoilt rivers, such as the Danube, the Rhine and the Elbe, which due to the weather situation have extremely little water in recent years, especially in the summer months. This means that shipping is then restricted there, resulting in shortages and supply bottlenecks.

Sebastian Poser: And certainly there are no great ways to influence the weather there. There is also no real solution for the natural rivers. There you could work with barrages or something similar, whereby this is also an intervention, where you certainly have to question for ethical reasons whether this is good or not. But these are the topics that occupy you in the meantime or at the moment. The fleet in tanker shipping is very new and the fleet in dry cargo shipping is very old, at least here in Northern Germany.

Sebastian Poser: The problem of the shortage of personnel is definitely there, because the so-called bargemen are slowly dying out. The fact is that people live on board. Most of the time it is father, mother and maybe dog. This kind of profession, that you really live on the ships, is no longer attractive for young people our age.
Dr. Lars Stemmler: May I catch this one on the spot? Are there any new concepts on the shipping side that address exactly that? And what do they look like?

Sebastian Poser: The existing concept was this father, mother and dog story. They were shipowners who had their own ship. So called Partikuliere. They then always had such a chartering office, we as Dettmers also chartere, we then get our 5% commission and they drive on freight basis and thus have their income and we take care that they have cargo.

Sebastian Poser: This is a situation in which there are almost no young people in the whole of Germany who still want to do this. Firstly, this is a high risk, because you have all the technology and the financing for these ships, and secondly, this area is rather unattractive in terms of the working environment, because one has to live on the ship.

Sebastian Poser: What we currently have in our shipping company or in many others is that you have normal employees, skippers, sailors, and then they have such a system: three weeks working and three weeks off, for a relatively good pay.

Sebastian Poser: And then it's just that you get half a year off. That's attractive again, that's a real tariff, an inland navigation tariff and that's the way it is again, that we could win some young people, because you have this leisure time compensation. Otherwise, they travel between 14 and 18 hours a day. So the three weeks on board, they are already relatively time-consuming and it is in principle work and sleep. But that will be balanced with the topic of leisure time. That's difficult, but I think if you have a good system, you can find good people.

Nele Albers: Okay, thank you very much. Do you know what is taught in Germany in the field of logistics?

Sebastian Poser: Yes, so I know that from the Hamburg Academy or from the Logistics School Kühne, there are treated the railway and the truck, the specific modes of transport and a bit of air freight. And also in ocean shipping, if you have courses of study there, like in Leer, then all modes of transport occur there, except the inland vessel, that's forgotten. And then there are people sitting in logistics departments or logistics purchasing and getting offers or making tenders and forgetting that there is also inland waterway transport. That is still the case. So inland waterway transport has no or only a very small share at universities and colleges.

Nele Albers: Okay, do you think additional content should be covered? That the topic should definitely be included?

Sebastian Poser: At least that would be nice if you had a block like that at school or university. That you at least know how efficient such a ship is. You always have to see that the normal freight forwarder or logistian doesn't think in terms of masses but in terms of tons, what fits on the truck or you sometimes have a container or a tanker. But if you then take the dimensions of the inland waterway vessel, then that's something completely different. We can put 180 containers on a barge at once or we can somehow go from A to B with two and a half thousand tons. This is also a completely different dimension from the imagination of a pupil or student. You might have to mention that, or you should mention it.

Sebastian Poser: It's a good thing you at least know it exists. What are the dimensions actually like? What can an inland waterway vessel actually do? And where can you actually travel long in Europe? What is the waterway network like? You can get almost anywhere. That would make sense.
Nele Albers: Okay, thank you. Now you've just taken up a little bit of that. Mr Stemmler has already mentioned that we are dealing specifically with competences. Are there any competences that come to your mind that a logistics student, a future decision-maker, should have in order to get inland navigation on his mental radar?

Sebastian Poser: Well, at least he needs to know there's inland shipping. That would be a good prerequisite. As I have already said, the ability to perform, the ability to know what makes sense in my logistics chain to cushion the impact of inland navigation. So of course there are relations or plans where it makes no sense to use an inland waterway vessel. But in the end it is always the practice that decides. That is difficult, I believe, to convey in theory. Because it is always very special and very specific.

Nele Albers: Then competences are often linked to specific professions and at the same time to the strategy of a company? If you look at this now in relation to inland navigation, do you think there are certain strategic objectives that inland navigation must or should achieve?

Sebastian Poser: That's kind of the chicken-and-egg problem.

Sebastian Poser: There are shipping companies like us that are willing to invest. We have now brought a few new tankerbuildings onto the market. But then you have the poor infrastructure. We have a ship lift here, for example, from which you can travel from Hamburg to the Elbe side canal. This has been a permanent construction site for several years and is to be rebuilt. Completion not before 2035.

Sebastian Poser: It's the kind of thing you say, it can't be. It has been known for several decades that this has to be changed - it takes ages. Inland navigation as such will certainly not have big innovative things. Some people always talk about autonomous navigation.

Sebastian Poser: It will take another 20 or 30 years before we can travel autonomously by inland waterway. There are so many unknowns, if you look at it in the press. It's all about mooring, it's all about wind and current, sport boats, canoeists and swimmers. Then there is the filigree mooring and casting off. There is the net coverage, many bridges, GPS and what you need.

Sebastian Poser: Sometimes I don't understand the people who put such actionism into this topic. Where I always say: Man, maybe one should rather look where one can still save crews. You also have a legal requirement for the crew, how many men have to be on board or how many people have to be, depending on the size of the ship and the operating times.

Sebastian Poser: And yes, inland shipping is already moving with the time. They also all have a computer on board, a laptop and they are also paperless. They also have an autopilot. That's all relatively good. But there is also the area of dry shipping. What I said to mother and father, they don't even have a fax. Then the ship will be 70 years old and they also sail through the area. But why not?

Nele Albers: But if you think about the future now, what do you expect? What are your personal expectations of young people who are now entering the logistics sector? But also Bachelor graduates, what do they have to bring to the market?

Sebastian Poser: I think it's getting harder and harder for young people because it's becoming incredibly transparent.
Sebastian Poser: Many professions will disappear completely and the whole subject of agents or brokers who sell cargo somewhere in between will, I believe, no longer be needed at some point. There will be a platform for that and so on. The specialty businesses will remain. Let me say, everything that revolves around bringing a few containers from A to B can also be done by a computer system, that’s not a problem.

Sebastian Poser: But as long as it’s about project cargo and project bulk and niche business, I still think it’s a very promising industry for the future. You also have to go ahead with know-how there. But everything that is standardized, that, I think, is not really relevant for the future. These are recurring processes that can be automated at some point and then that’s good. But in this department it makes sense for people to familiarize themselves with them.

Nele Albers: Is there anything else you’d like to give me? Something that is very interesting about this area?

Sebastian Poser: Good question. Certainly, the basic requirement is a good and efficient infrastructure. That, I believe, is the most important thing of all. But the same applies to roads, bridges and railway lines.

Sebastian Poser: The federal government now has a master plan for inland navigation until 2030. There is a Federal Transport Infrastructure Plan, a lot has been done and money has been made available.

Sebastian Poser: But these are all measures that take decades to complete somewhere. If you now drive from Hamburg to Würzburg, on the A7, then you have over 50 construction sites, because bridges are being built there or some other stories and that is just total madness.