Information and Communications in Germany

IDE 772-Educational Technology in Instructional Settings

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Introduction

Germany has a rich history that can be traced back to its early beginnings in 500 B.C. Like many other developed countries, Germany has gone through vast societal changes over the years. Everywhere you look in Germany, there is a unique set of customs and courtesies made up from its people, languages, and traditions. There are many scholars who study the country of Germany and consider this country to be made up of citizens who are critical thinkers. The country's values are witnessed within its rich customs and courtesies along with its unique celebrations. The diverse and unique landscape within the country is further witnessed within its education system. Within this project we will explore how the country's unique landscape, customs, and culture shape not only its education system, but we will also explore the impact of how information and communication technology is used in this European region.

Context

Geographic: Location and Climate:

According to (Frommer's.com, 2021), "Germany is in the heart of the European continent with its neighbors being Austria and Switzerland in the south. Located to the west is Germany's neighbors that include Belgium, Luxembourg, Netherlands, and France. Denmark serves as the foundational neighbor in Germany's north. The country itself consists of roughly 140,000 square miles and its capital is Berlin." The climate in most of Germany can be considered moderate, characterized by cold winters and warm summers.

Temperatures for this country can range from *0 degrees Celsius (32 degrees Fahrenheit)* average high in the **winter** to around *22 degrees Celsius (75 degrees Fahrenheit)* in the **summer**.

Weather in this country is heavily influenced by the Atlantic Ocean and cold air masses in Russia and the North Pole. Snowfall within the winter is quite frequent and is typically heavier in the mountains and north-eastern plains (Climatestravel.com, 2021).

Demographic: Population, Race, Ethnicity:

According to (CIA.gov, 2021) Germany has an estimated population of 79,903,481 people with a nationality of German. Within this nationality there are five major ethnic groups that make up the country. The five major ethnic groups in (2017) to include age demographics found in the country can be found in Table 1.1.

Ethnic Groups		Population Age Breakdown	
German	**87.2 %**	**0-14 years**	**12.89 %**
Turkish	**1.8 %**	**15-24 years**	**9.81 %**
Polish	**1 %**	**25-54 years**	**38.58 %**
Syrian	**1 %**	**55-64 years**	**15.74 %**
Other	**9 %**	**65 years and over**	**22.99 %**

Table 1.1 (CIA.gov, 2017)

Please note that according to (CIA.gov, 2021), the population is growing at an estimated –.021 % and *(ranks 209th globally)*. In addition, there are an estimated 8.63 births per 1,000 population *(ranked 212th globally)* and a death rate of 12.22 deaths per 1,000 population *(ranked 13th globally)*.

Social-Cultural: Brief History, Languages, Religions, Social Traditions, and Cultures:

The history of Germany, as stated earlier, is rich in tradition and has an eventful past. It is widely known that in the early 20th century the country itself was at the center of gravity for two world wars. In the 1940's, with the arrival of the Cold War, Germany saw internal civil unrest as it was split on two sides in the eastern and western parts of the country. In the western part of the country, the Republic of Germany (FRG) values aligned with the EU and NATO social-cultural ideals, values, norms, and economics. On the other side lay the communist German Democratic Republic (GDR) whose values aligned closely with the Soviet-led Warsaw pact. It was not until the decline of the former USSR in 1990 that Germany ultimately unified to form what is known today as one of Europe's largest economies and biggest political influences within the European region (Expacta.com, 2021).

In trying to understand the diverse languages within the country, it is well known that the national and standard language of Germany is German with over 95 percent of the population speaking such language. What is not so well known is that according to (Nag, O.S., 2018), "there are a variety of types of the German language to include Low German, Upper Sorbian, Lower Sorbian, Frisian, Romani, and Danish. In addition to the German Language, there are a variety of immigrants that now reside in the country that speak their native language. Some of these immigrants' geographical settlements include Turkey, Poland, Kurds, Russian, and Balkans." English is an important language to the country as it is taught through the education system in most of the schools. In fact, there are often numerous discussions within the population that advocate for the

English language becoming the official language. In my opinion, this thought process can be attributed to over half the population speaking it.

Religion within the country of Germany is extremely diverse. There are many religious influences in the country that help shape the spiritual center of gravity for its citizens. According to (CIA.gov, 2021), the following Table 1.2 (2018) depicts the seven most influential religions in the country.

Influential Religions in Germany

Roman Catholic	**27.7 %**
Protestant	**25.5 %**
Muslim	**5.1 %**
Orthodox	**1.9 %**
Christian	**1.1 %**
Other	**0.9 %**
None	**37.8 %**

Table 1.2 (CIA.gov, 2018)

There are many factors that make Germany a highly unique country that is extremely proud of its globally known traditions and cultures. The cuisine in Germany is world renowned and has a reputation of beer, sausage, and breads. According to (studying in Germany.org, 2019), "Germans consume around 140 liters of beer per year. They are the second largest beer consumers in Europe, after the Czech." Within the country there is many bakeries with thousands of varieties of baked goods to choose from. There is a sense of pride in every aspect of cuisine for the German culture.

The German people know how to celebrate and enjoy all aspects of the life, culture, and the traditions of being one of its citizens. There are hundreds of festivals and carnivals throughout the entire calendar year. Whether it is a street parade, holiday festival, or wedding, you will often see entire towns and cities fully partaking in the action. The cultural norm of celebrations often involves costumes with clear evidence of fun, observance, commemoration, pride, and honor from the entire population.

With such a rich history comes world renowned architecture. Germany is globally known for its castles and monuments throughout the landscape. The many examples of ancient architecture are what makes Germany what it is today. Every year, thousands of visitors come to see the ancient beauty that has been preserved in time. This ancient beauty is what helps lend to the extremely unique landscape of the German countryside. A visit to anyone of the many castles within Germany will quickly show you the beauty and rich history that this country has to offer.

Economic: development level, GDP, per capita income, etc...

The German economy is well respected around the world and according to (worldeconomics.com, 2021) "is *ranked 16th globally*. The annual GDP in 2020 for the country of Germany annually equated to 4.255 trillion dollars." According to (CIA.gov) "Germany is a world leader in exporting household equipment, cars, chemicals, and various types of machinery. Long-term growth within the country is a challenge and its increased migration is taxing its social welfare system. GPD growth has seen a decline in the last three years with a total of .55% decline since 2017. Overall, the German economy lacks investment and commitment. The good news is that it seems the Government has recognized this and intends on committing to increased investment which will ultimately help drive the country's trade and budget."

Political: traditions, parties, reforms, etc.…

Germany is known across the world as a democratic federal parliamentary republic, and its make-up is similar to the United States of America. According to (CIA.gov, 2021), within the three branches of Government consists of a form of executive branch. This executive branch contains a chief of state, head of government, and cabinet *(Bundesminister)*, who is recommended by the chancellor and appointed by the president. The president of Germany serves a 5-year term and is eligible for a second term with its last elections held in 2017. In addition to the president, an individual known as a chancellor (elected by party with most representatives) serves a renewable 4-year term. The last vote for chancellor was in 2018 (CIA.gov, 2021).

The second branch can be seen in the form of a legislative branch that contains a parliament known as the *(Bundesrat-69 seats);* Federal Diet known as *(Bundestag-709 seats)* whose members serve a 4-year term. The last elections for the legislative branch took place in 2017 (CIA.gov, 2021).

Lastly, the political make up of branches includes a third form of judicial branch with the highest of courts called the *(Federal Courts of Justice-127 judges).* In addition, there is a (*Federal Constitutional Court-Bundesverfassungsgericht).* Each judge can serve a 12-year term in scope and is limited to service until the retirement age of 68. A recent addition of English-speaking courts was added as recently as 2020 (CIA.gov, 2021).

In addition to the three branches, the German government make-up includes: multiple political parties, international organizations, and diplomatic representation from across various regions. All these entities play a huge role in shaping German policies. Like other democratic

nations, the country's political system contains state and regional levels with independent legislation.

Traditionally, Germany has vested interest and pays close attention to how the European Union is supported, advanced, and refined. Germany sees the support of the European Union as the best way to enable a secure future for the country and its citizens. Reform is important to the country, and it prioritizes policies such as unemployment, social justice, taxes, European unification, investment, security, migration, and defense.

The flag of Germany serves as the foundation for its political symbol. As seen below, the main colors of the flag are black, red, and gold. According to (ranked.com, 2020), there are two variants to the national flag of Germany. The first flag is the *Budesflagge* used for civilian use and the second is the *Bundesdienstflagge* used by the German government.

Budesflagge (Civilian)

Bundesdienstflagge (Government)

The colors of the flag serve as a foundation for the country's steadfast commitment to its defense, values, and culture. Black represents power, death, fear, aggression, and elegance; Red represents love, passion, desire, blood, fire, anger, courage, and leadership; and gold helps to represent the wisdom, compassion, wealth, and prosperity of the country (rankred.com, 2020).

Education

History of German Education:

Like its complicated and vast German history, the education system is equally as complicated. According to (stateuniversity.com, 2021), after World War II the country made great strides in eliminating Nazi values from its education system. The road was long and complicated, but gradually there were significant changes to help the education system in becoming more democratic. During the 1960's and 1970's, many new universities established themselves throughout the western part of the country. The education system still suffered as federal spending did not match the requirements needed to facilitate improvements. Large class sizes and a lack of qualified teachers led to a shortfall of skilled workers and educational technology (EdTech). During the 1980's, Germany's education system began to take form by expanding the pedagogy of teacher qualification and preparation. Still though, during this time, political strife between parties led to an unclear path of the direction and learning outcomes of German students within the educational system.

Control was solidified with the establishment of the Ministry of Education within the country, which allowed some national oversight over the directives within the education system. To note, even though a national Ministry of Education exists, Germany's education system has 16 separated states that each have their own independent educational systems. These 16 separate states have flexibility to form different policies and educational outcomes as they see fit to meet the states' needs. For this reason, and since the unification of Germany in 1990, the country still struggles with different philosophies and unified educational learning goals and objectives. Until the recent pandemic, the traditional brick and mortar classroom has been the model for education. The country's ability to transform to the new information and communication

technology age within the classroom and adapting the education system digitally using EdTech has been slow to form and compete on a global scale (educationstateuniversity.com, 2021).

Major German Educational Reforms:

Even with the internal struggles of the unification period in its education system, Germany has been considered a very educated society. Still, in the Anglo-Saxon Model education style, used in German education, there was room for improvement. The reform process started with a focus to support early childhood education. There is renewed focus to help underprivileged children start early to prepare them for grade school.

In addition, academic secondary school requirements are shrinking and leading to less years to complete by extending the school day and reforming a more productive school schedule. Traditionally in the German education system it would take five years to complete a degree, but this method is being changed to support a more American four-year style of degree completion.

Finally, there has been huge reform in Germany's commitment to produce skilled workers upon completion of education. The creation of a vocational education and training system has served as the foundation. According to the (Federal Ministry of Education and Research, 2015),

> "The Germany vocational education and training system, also known as the dual system, is highly recognized worldwide due to its combination of theory and training embedded in real-life work environment. This system is firmly established in the German education system and bridges the gap between education and hands-on training."

The following diagram 1.1 serves to showcase a model in Germany's commitment to helping reform its educational system to meet the demands of bridging the human performance gap from education to hands-on skilled application.

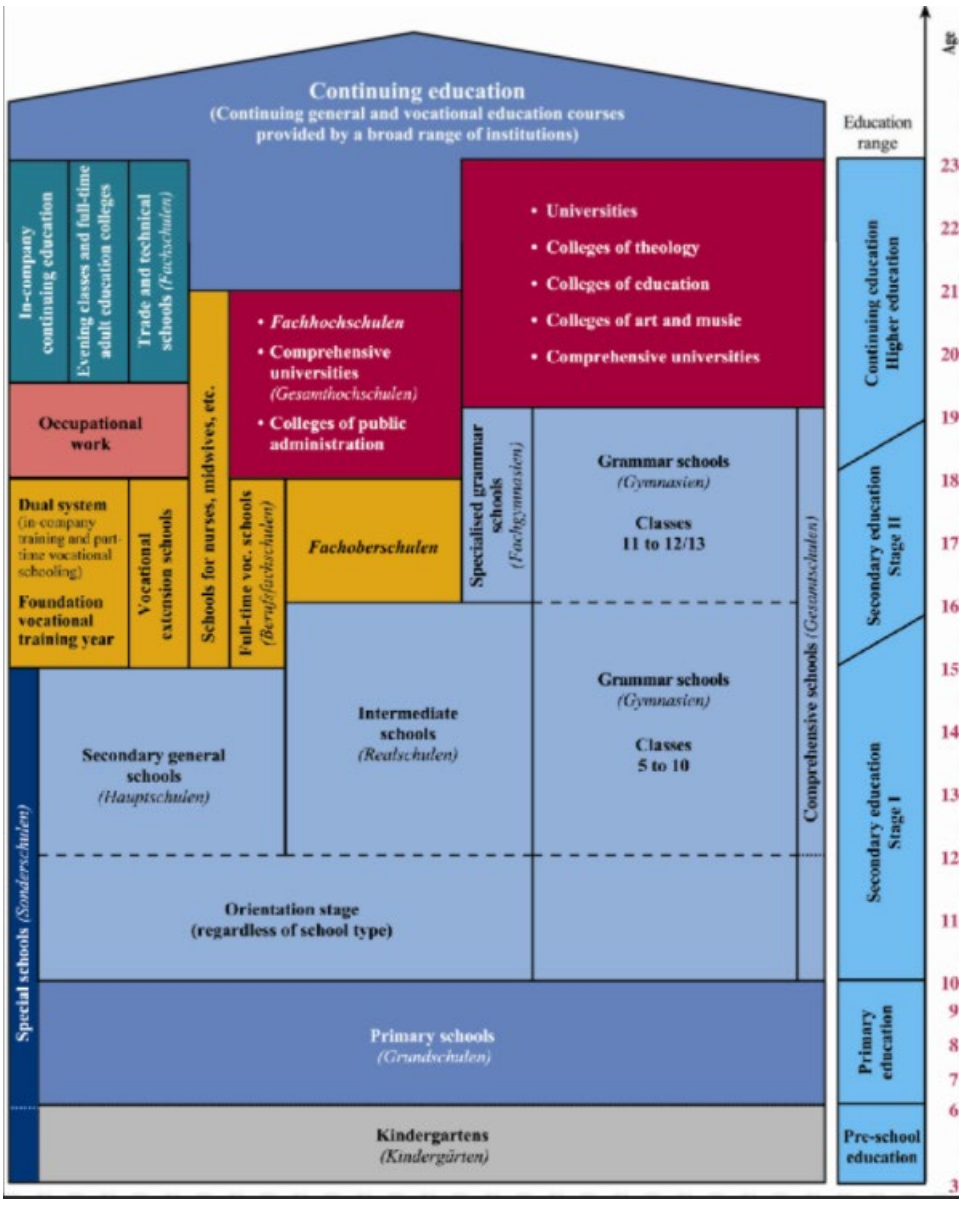


Diagram 1.1 German Vocational Education and Training System (2015)

Current Education:

The current state of education has Germany ranking well on the global stage. According to (expatica.com, 2021), "Germany is ranked 16th in mathematics, 16th in science, and 11th in

reading out of 72 countries and economies." In addition, and more impressive, is that at least half of its students enter a higher education institution. The public school system is where most students attend school and the cost, like the United States, is free. The education system in Germany for all kids ages six to fifteen is compulsory, but in many cases education within the German system will last until around 18 years of age. As detailed earlier in this project, all education policies are established by the 16 separate states with influence from the Ministry of Education. While the Ministry of Education does have some influence, each section or (land) has its own flexibility and establishes its educational programs, policies, and standards. This means that there is a good chance each student in the country will get a unique learning experience in various subjects, and different resources and methods will be used to instruct students.

The standard German school year typically starts around August and ends in the beginning of July. However, it does slightly vary depending on region. The school week for a German in most cases is like the United States; a student attends Monday through Friday, with its school day lasting roughly from 8:00 in the morning to 4:00 in the afternoon (Koptyug, E., 2020).

The overall make-up of the German education system according to (Koptyug, E., 2020) includes the "elementary, primary, secondary levels, followed by higher education in universities and universities of applied science. Further education is developed through apprenticeships, vocational training, distance and e-learning, as well as adult education outside of the school and university system."

According to (Koptyug, E., 2020), "Germany currently has 15,431 primary schools and 3,141 secondary schools. In addition, the most popular apprenticeship is retail salesperson,

most popular adult subject is health, and there are 1.33 million vocational trainees within the country."

A current issue facing the education system is a lack of educators. According to (Welle, D, 2018) as recently as 2018, "German schools are short nearly 40,000 teachers in total." This issue continues to hurt the education system within the country. There are many factors that are contributing to this issue, including teacher retirements, low pay, lack of investment in education, and difficulty in meeting teaching certification requirements. The path to becoming an educator is demanding and alternate methods need to be established in helping to close the need. This will be critical to the future of the education system (Welle, D, 2018).

Educational Technology

EdTech History:

Germany is not unfamiliar with the world of Information and Communication Technology (ICT). In fact, according to (trade.gov, 2020), "Germany has one of the largest ICT markets in the world and is one of the single largest software markets in Europe." The issue for the educational system within the country has been the ability to bridge the existing capabilities into the instructional world. The country of Germany is traditional in its values and morals, and hence, there has been a reluctance to incorporate EdTech in the classroom. For many years, Germany has been committed to an analog approach to instruction. In the early 2000s, you would be lucky to find even a single computer in a German classroom (Welle, D., 2018).

EdTech standards and reforms:

Although Germany has understood, for a few years now, the importance of EdTech within its education system, the global pandemic has really pushed the country into high gear for increased digital abilities in education. Important computer-based asynchronous learning was never a need

until the COVID-19 pandemic. The sudden need for online education due to a global pandemic surprised Germany much like many other countries. The country needed immediate action in the educational infrastructure and platform supply to support digital learning.

To meet the critical need for immediate asynchronous learning capabilities within the education system and according to (Stefan, T., 2021) a Quality Assurance Director and Editor at the World Education News

> "as recently as 2019, it committed €5billion euros (US$5.8 billion) for the modernization of its internet infrastructure and the increased supply of digital devices in Germany's 43,000 schools. However, the abrupt shift in March of 2020 to online education for close to 11 million school students in Europe's largest country exposed Germany's lack of readiness for digital learning. The crisis resulted in cascading calls across the political spectrum to rapidly advance the digitalization of schools."

This monetary commitment by the country of Germany provides us insight on the growing trend to both investing and improving EdTech capabilities within its education system. Germany, who already has robust ICT, can now allow its education system to tap into these critical resources to increase overall EdTech capabilities within the country.

EdTech Major Projects:

In addition to increased monetary resourcing, there is a growing digital education initiative supported by the German Chancellor to help bridge the ICT gap into the classroom. According to (Brandt, P., 2021) on 22 February 2021,

> " As part of the "Digital Education Initiative" *(Initiative Digitale Bildung)*, Chancellor Angela Merkel and Federal Minister of Education and Research Anja Karliczek introduced various projects and strategies, which will see the German Federal Government taking a more active role in education matters." The app (financed by the BMBF) is what prompted Chancellor Angela Merkel and Federal Minister of Education and Research Anja Karliczek to "give digital education in Germany a strong push" with their new "Digital Education Initiative."

The concept allows a center point for digital services for every citizen no matter age or education level. This program will allow various digital platforms to be linked in competition at a national level. Although there is still work to be done, there is now an increasing national emphasis on improving digital literacy from the German chancellor himself. This is yet another project that lends us to believe that Germany, has in fact, identified the importance of EdTech, and is now active in helping its education system. This will allow the country to leverage resources to enable its full capabilities within the entire region.

Ed Tech Current Situation:

The current EdTech situation is bright for the country of Germany. In this changing world, Germany has come to understand the importance of EdTech for the future. In 2019, Germany made big strides in its commitment to utilizing EdTech to its advantage and ensuring its education system stays relevant well into the future.

Changes are underway and according to (Rein, R., 2018), "Germany is supporting ICT initiatives such as digitalizing and updating libraries and other information centers. In schools

and universities, the use of tablets and increased focus on ICT in the curriculum has also started to make the rounds."

Lastly, the broadband capabilities continue to increase in the country to provide increased ICT capabilities within the classroom. According to the German Federal Ministry for Economics and Technology (2021), "it has set up the Broadband Portal to introduce technologies from DSL via fiberglass or UMTS right on up to Long Term Evolution (LTE)." In the end, all signs are positive for the current state of EdTech in Germany.

EdTech Future Trends:

The lack of a unified national education system will make change a bit difficult, but as we discussed earlier, with a national emphasis and monetary compensation, the future is pointing towards Germany's increased awareness of the importance of EdTech in its education system. Germany appears to understand that they must close the digital divide in the classroom, invest in modern infrastructures to support EdTech, apply flexibility and efficiency within the classroom, remain EdTech competitive globally, and be a driving force for future innovation.

According to the (Whiting, K., 2018) "Germany is currently in the driving seat when it comes to innovation - thanks in part to the speed it's developing new technologies like driverless cars." Although these changes will not occur overnight, the increased awareness coupled with resources and capabilities make the country of Germany ripe to become a global leader in EdTech. Germany is now investing heavily in online learning, pedagogical technology, interoperability, asynchronous learning, data, and privacy to increase its overall EdTech capabilities in the education system. The following chart depicts my take and opinions on both the strengths and weaknesses that can potentially influence the future trends of EdTech for Germany.

Strengths	Weaknesses
1. ***Monetary Commitment-*** In 2019, Germany committed 5 billion euros (US$5.8 billion dollars) for the modernization of its internet infrastructure and increased supply of digital devices in Germanys 43,00 schools. (Stefan, T., 2021).	1. **Customs and Traditions-** The EdTech-scene in Germany is not big-the competition is low. Most providers are younger companies and startups.(innovation Norway Europe, 2019). Traditional values tend to slow down importance of EdTech and are slow to gain acceptance and buy in.
2. National Oversight- Chancellor Angela Merkel and Federal Minister of Education and Research Anja Karliczek introduced various projects and strategies, which will see the German Federal Government taking a more active role in education matters. Digital initiative to give digital education in Germany a strong push. (Brandt, P., 2021)	2. **No nationally regulated Education System-** Although general education policy in Germany is set by the Federal Ministry of Education and Research (BMBF), each Federal state (*Länd*) has its own Ministry of Education which sets its own education program, schools, and standards. This means that the school system and what students learn vary across the country: there may be different types of schools available, and students may learn different subjects and use different textbooks in each region. (Expatica.com., 2021).
3. Robust Existing ICT Market Germany has one of the largest ICT markets in the world and is single largest software markets in Europe. (Trade.gov., 2020)	3. **Lack of Educators-** As recently as 2018, Germany schools are short nearly 40, 000 teachers in total. (Welle, D., 2018).
4. Leading Innovation Germany is currently in the driving seat when it comes to innovation - thanks in part to the speed it is developing new technologies like driverless cars. (Whiting, K., 2018).	4. **Lack of EdTech Professional Development for Educators-** However, there is frequently a mismatch between these skills and those needed to carry out digitally mediated schooling effectively. Significant investment is needed to make up the skills gap to effectively use EdTech capabilities.(Blume, S.,2020).

EdTech Resources:

Key People:

Federal Ministry of Education and Research

Head of Federal Ministry of Education

Federal Minister Anja Karliczek

Tel+49(0)228 99 57-0

Ext 3010/5000 (5003)

The following diagram 1.2 depicts the organizational chart for the German Federal Ministry of Education and Research. It provides the hierarchy diagram and contact information for the German Federal Ministry of Education and Research. All contact information found on this document was gained through public search using the Bing search engine and can be found on the official website of the German Federal Ministry of Education and Research.

In addition, the following diagram 1.3 depicts the locations to the Bonn, Germany, and Berlin Germany offices. The diagram has maps and directions to both offices with respective contact numbers, fax numbers, and e-mail addresses. All contact information found on this document

was gained through public search using the Bing search engine and can be found on the official website of the German Federal Ministry of Education and Research.

German Federal Ministry of Education and Research Organization Hierarchy Chart

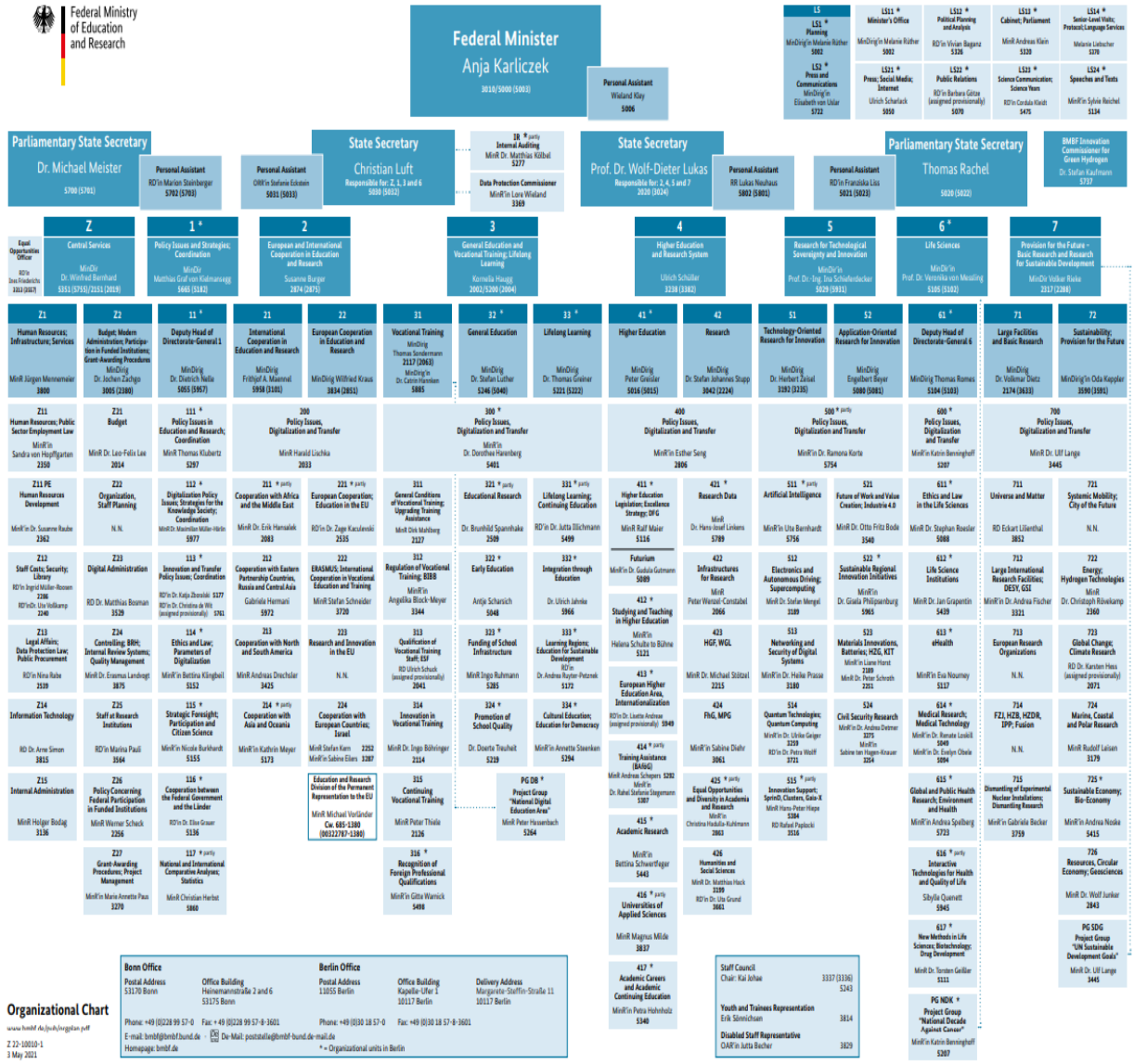


Diagram 1.2 German FME Organizational Chart

German Federal Ministry of Education and Research Contact Infromation

Federal Ministry
of Education
and Research

Organizational Chart

of the Federal Ministry of Education and Research

Bonn Office

Postal Address	53170 Bonn
Office Building	Heinemannstraße 2, 53175 Bonn
Office Building	Heinemannstraße 6, 53175 Bonn

Berlin Office

Postal Address	11055 Berlin
Office Building	Kapelle-Ufer 1, 10117 Berlin
Delivery Address	Margarete-Steffin-Straße 11, 10117 Berlin
Phone	+49 (0)228 99 57-0 or +49 (0)30 18 57-0
Central Fax	+49 (0)228 99 57-8-3601 or +49 (0)30 18 57-8-3601
Division Faxes	+49 (0)228 99 57-8- or +49 (0)30 18 57-8- (+ extension given after name)
E-mail	bmbf@bmbf.bund.de **For citizen enquiries and publication orders:** information@bmbf.bund.de
De-Mail	poststelle@bmbf-bund.de-mail.de
Homepage	http://www.bmbf.de

German Federal Ministry of Education and Research Location Maps

How to reach the BMBF in Bonn · Heinemannstraße 2 and 6

By car

A59 motorway

- to the "Bonn-Ost" interchange, then continue towards Bad-Godesberg
- take the "Bonn-Rheinaue" exit
- follow signs "Zu den Bundesministerien" into Heinemannstraße

A555 motorway

- to the "Bonn-Nord" interchange
- take the A 565 towards Siegburg/Bonn-Beuel as far as the "Beuel" junction
- then take the A 59 towards Königswinter as far as the "Bonn-Ost" interchange
- then take the A562 towards Bad Godesberg as far as the "Bonn-Rheinaue" exit
- follow signs "Zu den Bundesministerien" into Heinemannstraße

A565 motorway

- take the "Bonn-Poppelsdorf" exit
- continue along Reuterstraße via Willy-Brandt-Allee
- towards "Autobahn/Rheinaue" (underpass) onto Franz-Josef-Strauß-Allee
- follow signs "Zu den Bundesministerien" into Heinemannstraße

By rail

U 16 or U 63 (from Bonn main station "Hauptbahnhof")

- direction Bad Godesberg to "Max-Löbner-Straße/Friesdorf" (approx. 10 minutes)
- approx. 100 m to the BMBF (pedestrian entrance on Max-Löbner-Straße)

U 66 (from Bonn main station or Siegburg station)

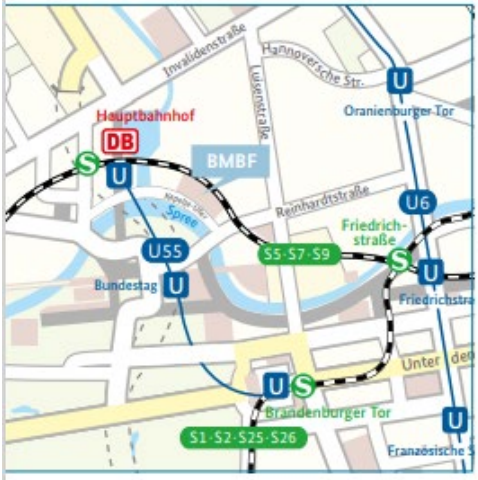
- direction Königswinter to "Robert-Schuman-Platz" (approx. 10 minutes from Bonn main station and approx. 45 minutes from Siegburg station)
- approx. 300 m to the BMBF

By air

From Konrad-Adenauer Airport

- take airport bus SB 60 to "Bonn-Hauptbahnhof" (main railway station)
- then continue by underground (U 16, U 63 or U 66) as described above

How to reach the BMBF in Berlin · Kapelle-Ufer 1



By rail

Berlin main station ("Hauptbahnhof")

- approx. 250 m to the BMBF

By air from Berlin-Brandenburg Airport BER

Arrival at BER Terminal 1 or 2

- Airport Express or Regionalbahn train to "Hauptbahnhof" (main railway station) (approx. 30 minutes)
- S 9 S-Bahn train to "Hauptbahnhof" (approx. 50 minutes)

Arrival at BER Terminal 5

- S 9 S-Bahn train to "Hauptbahnhof" (approx. 40 minutes)

Diagram 1.3 German FME Location Maps

EdTech/IT Programs at Universities

This section of the project outlines some points of contact for universities that offer EdTech and IT opportunities/programs in the country. To note, there are many programs that exist, and this section is aimed at highlighting a couple of the more popular programs within the region. Contact information, if interested, is provided in the following snapshots for each highlighted program.

Master of Science EdTech Saarland University

Saarbrucken, Germany

4 Semesters

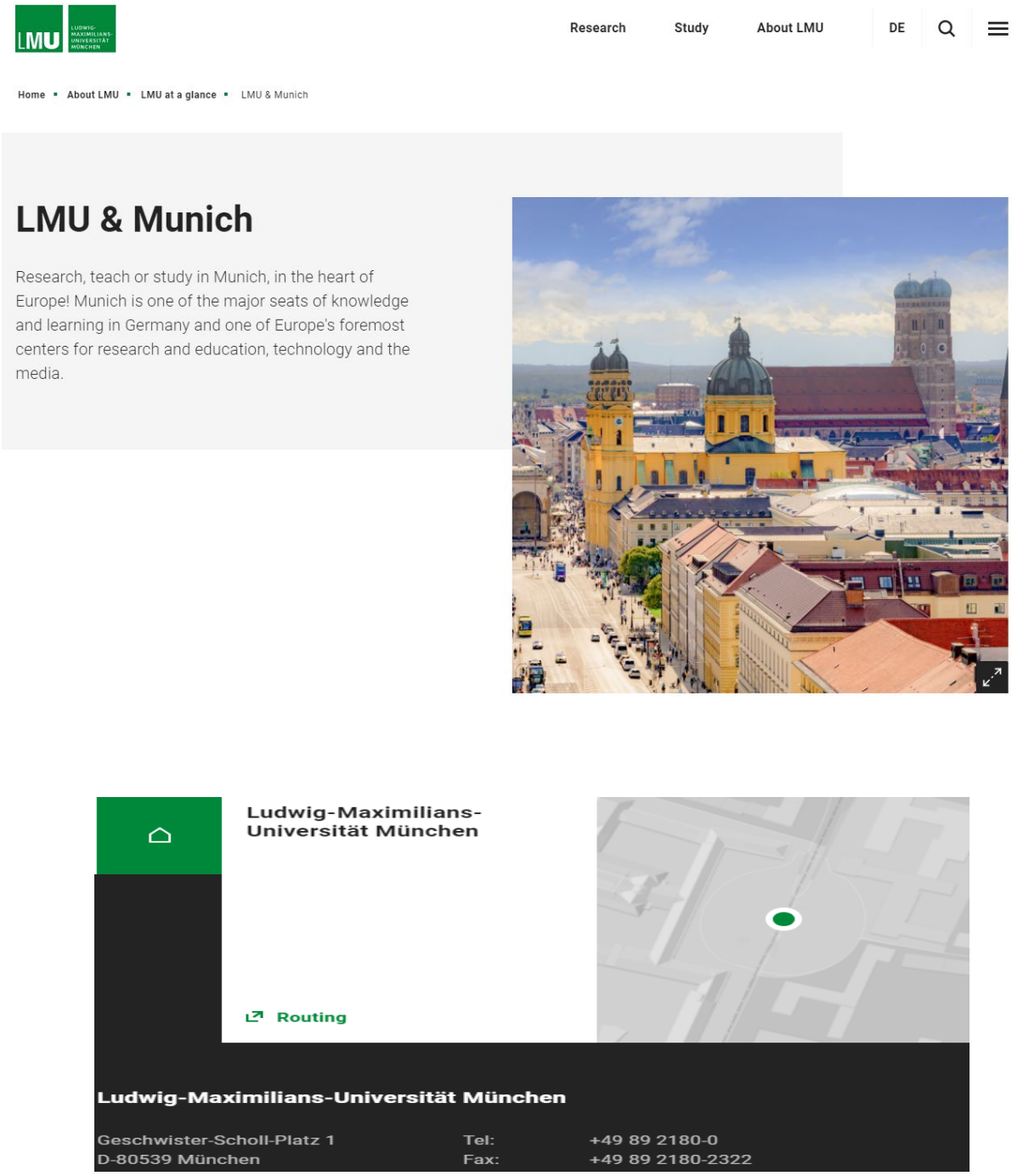
Program Highlights

Advances in technology are continuously enhancing learning inside and outside the classroom. Educational designers and educators need to understand and orchestrate the learning opportunities of the 21st century:

- hybrid and online learning
- community and collaborative learning
- Massive Open Online Courses
- learning management systems and social media
- digital tools and open educational resources
- game-based learning
- learning with multi-touch devices, e.g., smartphones, tablets, tabletops

Bachelor of Science EdTech Ludwig-Maximilians-University

Munich, Germany



Various semesters depending on IT program

University Highlights

LMU forms an integral part of the exceptionally broad-based network of research institutions, universities, foundations, and corporations based in Munich. As a major center for technology, cultural institutions and the media, Munich possesses an ideal range of infrastructure for study and research.

LMU is closely intertwined with the city's other research institutions, including the Technical University of Muenchen, the Max Planck Society and the Fraunhofer Society, with global enterprises, a vibrant start-up scene and prestigious libraries and museums.

The greater Munich area is a hub of innovation and the entrepreneurial spirit. The university works closely with leading German businesses and liaises with many key manufacturers, such as Audi, and numerous banks and insurance companies, such as Munich Re.

EdTech International Organizations or Projects:

The country of Germany participates in various international programs and/or projects to enhance collaborative efforts in the EdTech market. This section briefly describes a few of those organizations and/or projects:

1. *United Nations Educational, Scientific, and Cultural Organization:*

Organization dedicated to understanding that education is a human right and must be matched with quality. Only United Nations agency with mandates to cover all aspects of education. Provides global and regional leadership in education and strengthens education systems worldwide. Encompasses educational development from pre-school to higher education (UNESCO.com, 2020).

2. *Studying-in-Germany Organization-*

Studying-in-Germany.org is the largest information portal about studying in Germany for foreign students. Studying-in-Germany publishes news about the latest German higher education system changes and education policy updates, as well as a vast amount of informational content, articles, and research about studying in Germany for international students (Studying-in-Germany.org., 2019).

Factors to be Considered When Working EdTech in Germany:

There are several factors that must be considered to ensure that the planning and implementation of EdTech within the classroom is successful. As discussed throughout this project, Germany is a unique region and environment and thus, special factors must be considered. I recently wrote a short essay that can be accessed using the following link for my analysis of factors that would be successful to consider when working with EdTech in Germany.

URL Link:

Shortcut to EdTech Factors in Germany

In looking beyond the two factors discussed within my short essay, it is important to think about other factors, such as researching the country before you try to implement instruction. It is important to consider the cultural norms and traditions of Germany. German traditions run rich and heavily influence the educational system within the country. When working in the educational field, an individual must be willing to live and embrace the German culture. Embracing the culture and traditions, will help show the local population the necessary buy in to gaining respect for any recommendations made in the education field. Germany has a good baseline for ICT, so tapping into existing technology will also help you be successful within the

EdTech environment. In the end, a good bit of resilience and patience will help you to successfully incorporate EdTech within the country of Germany. The country has been slow to adopt this technology but now understands how important it will be to its educational future.

Conclusion

In this project we have explored how Germany's unique landscape, customs, and culture shape not only its education system, but also how the impact of information and communication technology is used in this European region. There are many strengths for future EdTech incorporation within the classroom that include an increased monetary commitment to EdTech, increased oversight from a national level on EdTech options in the country, a robust ICT market capability within the region, and the ability to globally lead in technology innovation.

With all its strengths there remain some challenges that exist to help with the future EdTech application in the country. The longstanding customs and traditions of this country have become a roadblock in adoption of new EdTech application in the education system. If Germany is going to become a global leader and model for EdTech application, it will need to find a way to change the traditional way of thinking about technology in the country. A key component in helping to shape application of EdTech in the country will be forming a nationally regulated educational system. The current 16 state system leaves the door open for many different methods of education application. National oversight can help increase both the awareness and importance of EdTech in the education system, and it can also help formulate national policies for application of EdTech now and in the future. Germany must also find a way to increase both the number of educators along with the needed professional development to successfully incorporate EdTech in the curriculum. The ability to provide better pay and professional development will increase the desire to not only make up for the shortage in educators, but also

provide them with the training and expertise to apply EdTech successfully in the classroom. By increasing the knowledge and skills necessary of its educators, Germany will enable their education system to excel to the next level for future EdTech application.

In the end, as we discussed in the project, Germany has clearly identified a need for EdTech. Germany is committed to allocating the resources necessary for it to be successful, and currently possesses the ICT capabilities to not only achieve it but become a global influencer and leader in this rapidly increasing market. I am confident that Germany will ensure its future educational system includes the newest EdTech so that its schools do not fall behind now and in the future.

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