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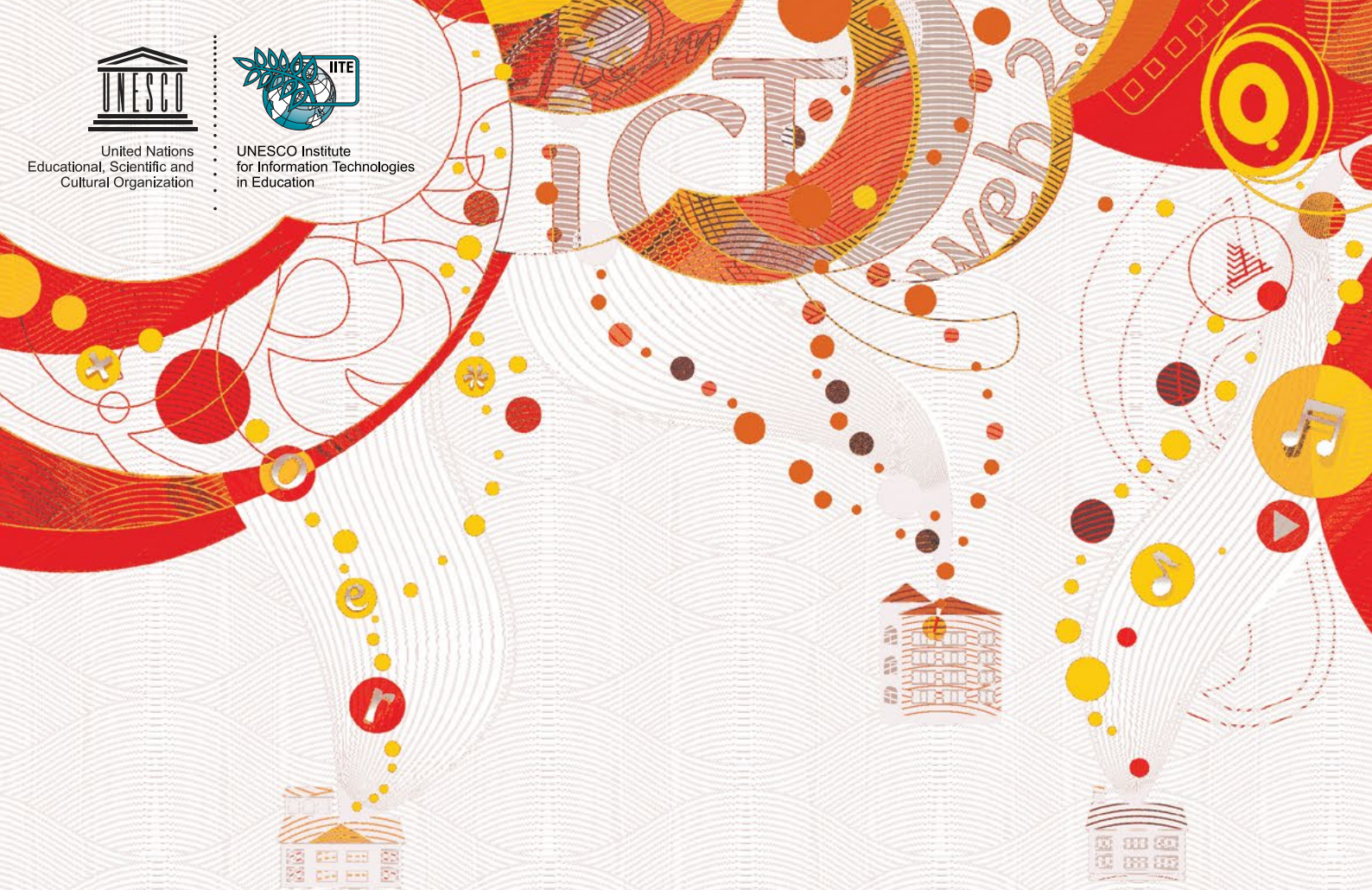

Dominic Orr, Jan Neumann
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German OER Practices and Policy – from Bottom-up to Top-down Initiatives

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Foreword

I am pleased to introduce the new publication produced by the UNESCO Institute for Information Technologies in Education (UNESCO IITE) within its project on Open Educational Resources (OER) in non-English-speaking countries. This report focusses on a holistic understanding of OER, including the policy perspective, as well as technical, legal, social and didactical aspects. The report provides a brief overview of the OER-related developments in Germany, describes the structure of the German education system and reveals major educational challenges. The authors of this study analyzed the state of advancement of OER in Germany using bottom-up and top-down perspectives. The study proved that in Germany both types of activities exist in parallel, although more focus is needed for policy-led, facilitative initiatives in the future.

Since 2009, the needs and challenges for open education and OER have been surveyed by UNESCO IITE in Armenia, Azerbaijan, Belarus, Kazakhstan, Moldova, Russia, Ukraine, Uzbekistan, as well as in Latvia and Lithuania. The results of the cross-national survey of OER in the Commonwealth of Independent States were published in the monograph "CIS on the Way towards OER". Later on the geographical scope of the IITE OER project expanded to include Japan, China, Brazil, Turkey and Vietnam. UNESCO IITE published the case studies on OER in Lithuania, Brazil, China, Kenya, Poland, Russia and France (2011, 2012, 2013, 2015 and 2016, respectively). In total, 21 non-English-speaking countries were surveyed.

Though Germany could be characterized as a relatively latecomer to the OER scene, there is a strong OER community in the country and the OER World Map data for Germany shows 166 organisations involved in OER-related practices. Recent government activities in the field of OER include the OERinfo funding programme, which was launched in November 2016. There are some important achievements at the level of federal entities, for example, the establishment of the Hamburg Open Online University, which is currently the most ambitious OER project in Germany. Considering the fact that for the German educational community and the authorities of different levels, OER are recognized for their potential in fostering innovation, it is expected that the recent and forthcoming grassroots OER initiatives and those triggered by the authorities will favour the advancement of open education in Germany.

The term "open educational resources" was first adopted at UNESCO's 2002 Forum on the Impact of Open Courseware for Higher Education in Developing Countries and since then the transformative potential of OER has been proved in English-speaking countries mostly in higher education. Promoting the production and use of open content in languages other than English for ensuring wide access to quality education and life-long learning and supporting linguistic and cultural diversity has become increasingly important.

Tao Zhan,
Director
UNESCO IITE

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The authors would like to thank everyone who contributed to providing information and insights for this report. First and foremost, we would like to acknowledge Irina Geanta for her patient and thorough improvements, completions, connections and corrections of the report. Furthermore, we would like to offer our thanks to the following persons (in alphabetical order) for advice and support: Ingo Blees, Boris Bockelmann, Sonja Borski, Perrine de Coetlogon, Karin Driesen, Gabi Eckart, Gabi Fahrenkrog, Barbara Getto, Doris Hirschmann, Till Kreutzer, Kerstin Mayrberger, Luca Mollenhauer, Felix Ostrowski, Peter Rempis, Christian Richter, Jan Schallaböck, Philipp Schmidt and Annett Zobel.

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Executive summary

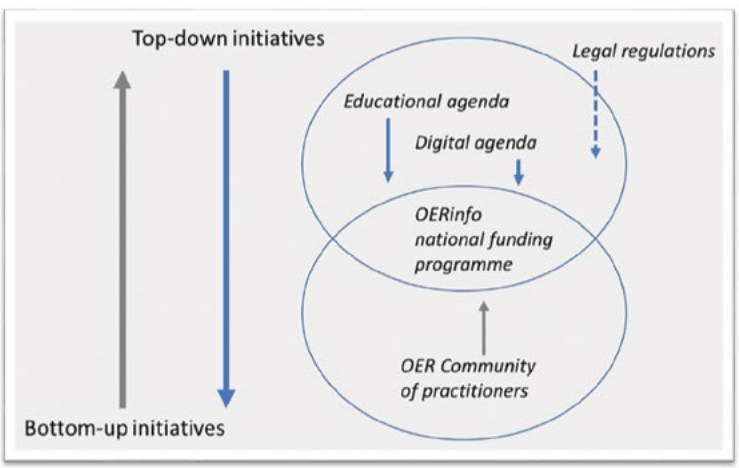
This study was commissioned by UNESCO's Institute for Information Technology in Education as part of their series on the status of developments concerning Open Education Resources across the world. Germany is an interesting country for such an overview, since it can be described as a late-comer to OER. With rare exceptions, the international debate was largely ignored in Germany during the early years of OER. However, this view neglects the strong OER community in Germany, which has been active for many years. Whilst internationally German's presence in the OER discussion was missed, a first white paper on OER was published in early 2012, a first OER-focussed (un)conference in late 2012 and a first national hearing of OER experts was called by the German Federal Ministry of Education and Research (BMBF) (see Chapter 1).

The approach chosen by the authors of this study was to structure the report around the question of which bottom-up (community-led) and which top-down (policy-led) initiatives have occurred and are worth featuring as central to the constellation of OER practices in Germany today. This approach is illustrated in Figure 0.1 below, where key aspects for top-down and bottom-up initiatives are also highlighted.

The study shows that Germany is a case where both types of activities exist in parallel, although more focus is hoped for top-down, facilitative initiatives in the future. This is likely to happen, when the digital agenda for education is implemented, as OER is frequently mentioned as part of this agenda, but also when the general educational agenda discovers the potential benefits of OER for improved and more individualised and context-dependent access to learning opportunities (see Chapter 4). A current and recognised blockage to OER practice are the legal regulations of copyright, which are in need of further reform (see Section 4.4). An encouraging development in this context is that close to 10% of OER services in Germany offer resources under the public domain CC 0, which, from a user perspective, represents the optimum for easy reuse.

Overall, the OER World Map data for Germany shows 166 organisations to be involved in OER-related practices, supporting 104 services (see Chapter 5). Here Germany is no different to other countries in having more services in the school sector and higher education, but it also with a substantial amount as cross-sector services, which bring the community together for peer learning and knowledge exchange. It should also be noted that activities in the higher education sector also have a cross-sectional dimension: experts from the higher education sector use their expertise to support developments in other educational sectors, e.g. by providing services for the school sector or leading projects within the OERinfo funding line.

Figure 0.1: Overview of the main components relevant to OER development in Germany



For each of the educational sectors, the study offers selected cases, chosen to illustrate the type of activities in each sector and for their specific relevance. These cases are provided for top-down and for bottom-up activities.

As Germany is a federal state, some of the top-down initiatives come from specific states (see Chapter 6). In the case of the

city-state Hamburg, in 2015 it started the Hamburg Open Online University — HOOU (see Section 6.3.1), which — at the moment — is the most ambitious and best funded OER project in Germany. The HOOU project follows an innovative design, which focusses strongly on openness and cooperation. The project is driven by the six public higher education institutions (HEIs) located in Hamburg including a medical university, a technical university, as well as universities for music and theatre and fine arts. With the preparation phase complete, the first earnest phase of the project has now begun and is funded until the end of 2018, when a first full evaluation of its impact will be possible. This is just one example of state-led initiatives. On a national level, it is the so-called OERinfo funding programme which is of interest. It is the most significant German government action in the field of OER so far. This programme has recognised the importance of an enabling interface between top-down interests and bottom-up activities and largely focusses on facilitative activities such as train-the-trainer initiatives and supporting first ideas for trainer certification. It is a two-year programme and can be evaluated at the end of 2018.

When compared to other countries Germany has scored low on top-down and high on bottom-up activities in the past. This is a consequence of German politics having largely ignored the topic of OER until recently, although this has been changing. Since OER activities are mostly driven bottom-up, there has been a need for sharing questions, experiences and materials between players, who have been isolated in their own institutions. These players found opportunities for sharing in cross-sector events and communities. Especially the barcamp/unconference format turned out to fit tremendously well developing a strong German OER community. Indeed, Germany so far has seen a remarkably strong cross-sector community with common interest in OER. So, whilst the presentation of bottom-up initiatives highlights particularly cases, it also presents a special focus on the events to support community exchange (see Chapter 7).

It is interesting to note that the OERinfo funding programme works well, no matter what future political decisions related to OER might look like. If there is a decision to step deeper into OER with a sorely needed further funding of infrastructure and content development, OERinfo is a perfect starter for the wider programme (see Chapter 8). If on the other hand, no major investment in OER follows, OERinfo still makes sense, since the various awareness-raising activities and opportunities for knowledge exchange will arguably increase the number of people using existing OER platforms and tools.

This review of OER-related activities in Germany, therefore, provides at least four key insights for other countries:

- A potential for supporting OER is emerging within the general educational debates on how to assure effective digital educational strategies and practices. OER are well-placed within this framework, but it is important to review whether their full potential is reflected in key strategic documents.
- In many countries, there are a significant number of OER practitioners. Governments can use top-down policy programmes to support them and provide them with the opportunity for exchanging knowledge and practices.
- Copyright clarity remains an important framework condition for OER and indeed for digital education, since legal uncertainty before OER practices will not disappear afterwards. But at the same time, the confusing situation in Germany can be considered one of the main drivers of OER adoption. The more the law fails to provide practical solutions, which make use of the potentials of the new technologies, the more OER appears to be a feasible alternative.
- Quantitative and qualitative information, monitoring and research are important for any educational reforms and therefore it is also just as important for OER activities. In this context, the authors would like to point to the relevant information, which could be attained for the German entries to the OER World Map. This tool should be exploited by other countries to fully highlight their own activities. However, this is not enough. Specific evaluations of programmes and practices are vital and it is unfortunate that the very positive OERinfo funding programme has not foreseen such requirements in the current funding round. The authors hope that other countries will remember this important element of change management.

Zusammenfassung

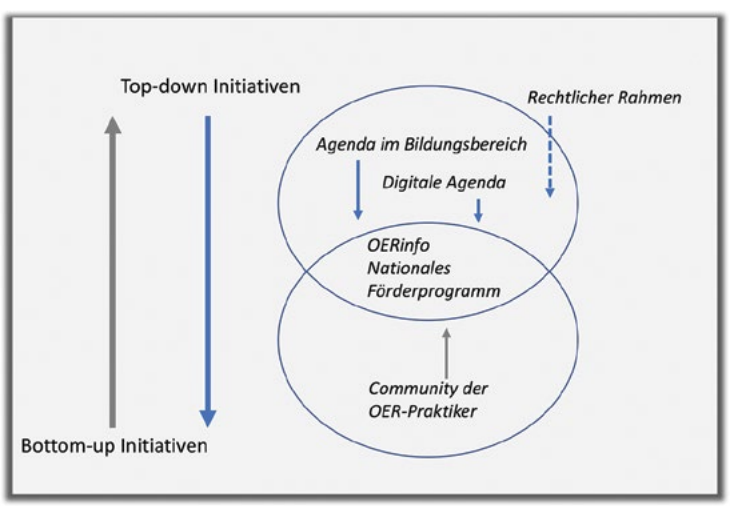
Diese Studie wurde im Auftrag des Institute for Information Technology in Education der UNESCO erstellt. Sie ist Teil einer Reihe von Bestandsaufnahmen in Bezug auf Open Educational Resources (OER) auf der ganzen Welt. Deutschland ist für einen solchen Überblick ein interessantes Land, weil es als Spätzünder in Sachen OER bezeichnet werden kann. Mit wenigen Ausnahmen wurde in Deutschland die internationale Debatte um OER in den frühen Jahren weitgehend ignoriert. Dies berücksichtigt jedoch nicht die starke OER-Community in Deutschland, die schon seit vielen Jahren aktiv ist. Während man auf internationaler Ebene eine deutsche Präsenz vermisste, wurde Anfang 2012 ein erstes Whitepaper zu OER veröffentlicht, eine erste (Un-)Konferenz zu OER fand im Herbst 2012 statt, und das Bundesministerium für Bildung und Forschung (BMBF) lud zu einer ersten Expertenanhörung (vgl. Kapitel 1) ein.

Die Autoren haben diesen Bericht entlang der Zweiteilung in Bottom-up- (von der Praxis ausgehend) und Top-down-Initiativen (von der Politik ausgehend) strukturiert, sofern sie sich als relevant für die heutige Situation von OER in Deutschland herausgestellt haben. Abbildung 0.1 illustriert diesen Ansatz und hebt zusätzlich zentrale Aspekte für Top-down- und Bottom-up-Aktivitäten hervor.

Die Studie zeigt, dass in Deutschland beide Arten von Initiativen parallel existieren, auch wenn für die Zukunft auf einen stärkeren Fokus zugunsten von unterstützenden Top-down-Initiativen gehofft werden kann. Die Chancen dazu stehen gut, sofern der Digitalpakt zwischen Bund und Ländern und entsprechende Vorhaben in den einzelnen Ländern umgesetzt werden, da OER in diesem Kontext bereits häufig genannt wird, aber auch wenn im Rahmen der allgemeinen Bildungsdebatten die Potentiale von OER für bessere, individualisierte und situationsgerechte Lernmöglichkeiten entdeckt werden (vgl. Kapitel 4). Ein aktuelles und bekanntes Hindernis für die OER-Praxis sind die gesetzlichen Bestimmungen im Urheberrecht, die weitere Reformen benötigen (vgl. 4.4). In diesem Zusammenhang ist es eine ermutigende Entwicklung, dass nahezu 10% der OER-Services in Deutschland Ressourcen unter Public Domain CC0 anbieten — die aus der Sicht der Nutzer das Optimum für eine einfache Nachnutzung darstellen.

Die Daten der OER World Map zeigen für Deutschland 166 Organisationen, die an OER-bezogenen Aktivitäten beteiligt sind und insgesamt 104 Services unterstützen (siehe Kapitel 5). In Deutschland liegt — nicht anders als in anderen Ländern — der Schwerpunkt der Aktivitäten in den Bereichen Schule und Hochschule. Gleichzeitig zeichnet sich Deutschland durch einen hohen Anteil von bereichsübergreifende Aktivitäten aus, die die Community für Voneinander-Lernen und Wissensaustausch zusammenbringen. Es ist auch zu beachten, dass die Aktivitäten im Bereich Hochschule zusätzlich eine Querschnittsdimension aufweisen: Experten aus dem Hochschulbereich nutzen ihre Expertise, um Entwicklungen in anderen Bildungsbereichen zu unterstützen, z.B. durch die Bereitstellung von Services für den Schulsektor oder durch die Koordination von Projekten innerhalb der OERinfo-Förderlinie.

Abbildung 0.1: Überblick über die die Hauptkomponenten, die die OER-Entwicklung in Deutschland beeinflussen



Für jeden Bildungssektor stellt die Studie ausgewählte Praxisbeispiele vor, die die spezifischen Aktivitäten in jedem Sektor und ihre Relevanz veranschaulichen sollen. Diese Praxisbeispiele werden sowohl für Top-down- als auch für Bottom-up-Initiativen vorgestellt.

Da Deutschland föderal organisiert ist, kommen einige der Top-down-Aktivitäten aus einzelnen Bundesländern (vgl. Kapitel 6). Im Fall des Stadtstaates Hamburg wurde 2015 die Hamburg Open Online University (HOOU, vgl. 6.3.1) initiiert, die im Moment das ambitionierteste und am besten geförderte OER-Projekt in Deutschland ist. Der Ansatz der HOOU verfolgt ein innovatives Design, das stark auf Offenheit und Kooperation setzt. Das Projekt wird von sechs öffentlichen Hochschulen in Hamburg getragen, darunter ein Universitätsklinikum, eine Fachhochschule, die Hochschule für bildende Künste und die Hochschule für Musik und Theater. Die Vorbereitungsphase des Projektes ist abgeschlossen, so dass nun die erste Hauptphase begonnen hat, die bis Ende 2018 finanziert ist. Eine erste umfassende Einschätzung zu den Wirkungen wird dann möglich sein. Dies ist nur ein Beispiel für eine Länder-geführte Initiativen. Auf Bundesebene ist das OERinfo-Förderprogramm, die bisher bedeutendste staatliche Maßnahme im Bereich OER in Deutschland, von besonderem Interesse. Das Programm hat die Bedeutung einer fähigen Schnittstelle zwischen Top-down-Interessen und Bottom-up-Aktivitäten erkannt. Es konzentriert sich weitgehend auf unterstützende Initiativen zur Sensibilisierung und Qualifizierung von Multiplikatoren (Train-the-Trainer-Maßnahmen) und unterstützt erste Ideen für die Zertifizierung von Lehrenden. Das zweijährige Programm kann Ende 2018 ausgewertet werden.

Vergleicht man Deutschland mit anderen Ländern, so gab es in Deutschland in der Vergangenheit wenige Top-down- und viele Bottom-up-Initiativen. Die Ursache dafür liegt in der Vernachlässigung des Themas durch die deutsche Politik, was sich aber inzwischen verändert hat. Da OER-Initiativen vor allem bottom-up vorangetrieben werden, gab und gibt es einen großen Bedarf, Fragen, Erfahrungen und Material untereinander auszutauschen, zumal die Akteure teilweise auch innerhalb der eigenen Institutionen isoliert arbeiteten. Die Akteure und Initiativen haben dafür Gelegenheiten in bereichsübergreifenden Veranstaltungen und Communities gefunden. Insbesondere das Barcamp-/ Unkonferenz-Format hat sich als sehr effektives Mittel herausgestellt, um eine starke OER-Community in Deutschland zu entwickeln. Vor diesem Hintergrund wird neben der Vorstellung von konkreten Bottom-up-Initiativen auch ein besonderer Fokus auf die Veranstaltungen gelegt, die den Austausch innerhalb der Community unterstützen (vgl. Kapitel 7).

Interessanterweise lässt sich feststellen, dass das Förderprogramm OERinfo gut funktioniert, unabhängig davon, wie zukünftige politische Entscheidungen zu OER aussehen mögen. Falls die Entscheidung zugunsten einer stärkeren Verankerung von OER zusammen mit einer dringend benötigten Förderung von Infrastruktur und Materialentwicklung fallen sollte, ist OERinfo ein hervorragender Ausgangspunkt für ein weitergehendes Programm (vgl. Kapitel 8). Falls es andererseits nicht zu weiterer substanzieller Förderung von OER kommen sollte, bleibt OERinfo weiterhin sinnvoll, da die verschiedenen Initiativen zur Sensibilisierung und zum Wissensaustausch mit Sicherheit die Anzahl von Personen erhöhen dürfte, die bestehende OER-Plattformen und -Werkzeuge nutzen.

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Die Analyse von OER-bezogenen Maßnahmen in Deutschland liefert mindestens vier zentrale Erkenntnisse für andere Länder:

- Innerhalb der allgemeinen Diskussion um effektive digitale Bildungsstrategien und -praktiken zeichnet sich die Bereitschaft zur Unterstützung von OER ab. OER wird bereits jetzt in dieser Diskussion angemessen berücksichtig. Trotzdem bleibt es wichtig darauf zu achten, dass sich das volle Potential von OER in zentralen Dokumenten wiederfindet.
- Es gibt in vielen Ländern eine signifikante Anzahl von OER-Praktikern. Regierungen können Top-down-Policy-Maßnahmen so gestalten, dass sie die OER-Praktiker unterstützen und ihnen Gelegenheiten zum Austausch von Wissen und Praktiken geben.
- Klarheit in Urheberrechtsfragen bleibt weiterhin eine wichtige Rahmenbedingung für OER und digitale Bildung im Allgemeinen. Entsprechende Unsicherheiten bleiben mit oder ohne OER-Praktiken bestehen. Andererseits kann die verwirrende Rechtslage in Deutschland als einer der Haupttreiber für die Verbreitung von OER gesehen werden. Je stärker die Gesetzgebung daran scheitert, praktikable Lösungen für die Nutzung des Potentials neuer Medien zu finden, desto hilfreicher erscheint OER als gangbare Alternative.
- Quantitative und qualitative Informationen, Monitoring und Forschung sind wichtig für jede Bildungsreform, also auch für OER-bezogene Initiativen. In diesem Kontext möchten die Autoren auf die Informationen hinweisen, die von der OER World Map bereitgestellt werden können. Die OER World Map sollte als Werkzeug auch von anderen Ländern genutzt werden, um einen Überblick über ihre eigenen Aktivitäten zu erhalten. Allerdings reicht das alleine nicht aus. Die spezifische Evaluation von Programmen und Praktiken ist von entscheidender Bedeutung. Und es ist unglücklich, dass das insgesamt sehr gute Förderprogramm OERinfo entsprechende Verpflichtungen in der laufenden Förderperiode nicht vorgesehen hat. Die Autoren hoffen, dass andere Länder diesen wichtigen Bestandteil von Change-Management beachten.

Résumé

Cette étude a été commandée par l'Institut de l'UNESCO pour l'application des technologies de l'information à l'éducation. Elle fait partie d'une série sur l'état des Ressources Educatives Libres (REL) à travers le monde. L'Allemagne est un cas d'étude intéressant puisque le domaine des REL y est considéré comme relativement récent. A quelques exceptions près, la discussion internationale sur les REL a été largement ignorée Allemagne dans les premières années. Il ne faut pas pour autant sous-estimer la force de la communauté des REL existante en Allemagne, qui est déjà active depuis plusieurs années. Bien que l'Allemagne ait été absente un certain temps de la scène internationale, un premier livre blanc sur les REL a été publié début 2012, suivi à l'automne d'une première (non)-conférence sur les REL et enfin d'une première audition des experts du domaine par le Ministère fédéral allemand de l'Education et de la Recherche (voir Chapitre 1).

Les auteurs ont structuré l'ensemble du présent rapport en distinguant les initiatives ascendantes (venant des acteurs de terrain, de la pratique) et descendante (partant de la gouvernance politique) [en anglais, respectivement, *bottom-up* et *top-down*] selon leur pertinence au regard de la situation actuelle des REL en Allemagne. La figure 0.1 schématise cette approche et met en outre en lumière les concepts clés correspondant, activités « descendantes » et « ascendantes ».

L'étude montre qu'en Allemagne, les deux types d'initiatives existent en parallèle, même si l'on peut espérer pour l'avenir un soutien plus important des initiatives descendantes. Il y a de fortes chances d'aller dans ce sens dans la

mesure où le Pacte numérique entre l'Etat fédéral et les Länder, ainsi que les projets correspondants mis en œuvre au niveau de chacun des Länder, citent fréquemment les REL, mais aussi parce que l'on découvre dans le cadre des discussions générales relatives à l'éducation les potentialités des REL pour un apprentissage meilleur, personnalisé et adapté à toutes sortes de situations (voir Chapitre 4). Parmi les obstacles principaux à l'utilisation des REL, le plus connu et le plus complexe a trait au droit d'auteur, qui nécessiterait une réforme supplémentaire (voir 4.4). Dans ce contexte, il est encourageant de constater que près de 10% des services de REL en Allemagne sont des ressources proposées sous domaine public CC 0, la licence optimale pour en faciliter la réutilisation par l'utilisateur.

Les données de la carte mondiale des REL montrent, pour l'Allemagne, 166 organisations ayant des activités se rapportant à la pratique des REL et au total, 104 services de support (voir Chapitre 5). En Allemagne, comme dans d'autres pays, l'essentiel des activités a trait aux enseignement scolaires et supérieurs. En même temps, l'Allemagne se distingue par une proportion importante d'activités allant au-delà des domaines de chacun, rassemblant ainsi la communauté pour des échanges de savoirs et de bonnes pratiques. Notons que les activités au sein de l'enseignement supérieur apportent en outre une dimension transversale : les experts de l'enseignement supérieur utilisent leur expertise pour soutenir les développements d'autres domaines d'enseignement, en proposant par exemple de mettre leurs services à disposition du secteur scolaire ou bien par la coordination de projets financés par la ligne OERinfo.

Pour chaque secteur d'éducation, l'étude présente des exemples pratiques sélectionnés afin d'illustrer les activités spécifiques dans chaque secteur et leur pertinence. Des exemples pratiques sont présentés tant pour les initiatives ascendantes que les initiatives descendantes.

L'Allemagne étant un Etat fédéral, certaines initiatives descendantes proviennent de Länder spécifiques (voir Chapitre 6). La ville de Hambourg, qui est aussi un Land, a lancé en 2015 le projet de la Hamburg Open Online University (HOOU), qui est aujourd'hui le projet REL le plus ambitieux et le mieux financé en Allemagne. Le projet HOOU met en œuvre un modèle innovant mettant l'accent sur l'ouverture et la coopération. Le projet est mené par les six établissements d'enseignement supérieur de Hambourg, comprenant un centre hospitalier universitaire, une université de sciences appliquées et technologies, ainsi qu'une école des beaux-arts et un conservatoire de musique et de théâtre. La phase préparatoire du projet étant terminée, la première phase principale a démarré, financée jusqu'à la fin de l'année 2018. Une première estimation globale de son impact sera alors possible. Il s'agit ici d'un exemple parmi d'autres initiatives au niveau des Länder. Au niveau fédéral, le programme de financement OERinfo est la mesure publique la plus importante à ce jour dans le domaine des REL. Elle est également particulièrement intéressante. Ce programme a reconnu l'importance de favoriser l'interface entre les initiatives venant du haut et celles portées par les acteurs de terrain. Elle se concentre largement sur des activités facilitatrices telles que la sensibilisation et la qualification des formateurs (actions de

Figure 0.1: Aperçu des principaux composants influant sur le développement des ressources éducatives libres en Allemagne

formation de formateurs). Elle soutient les premières idées relatives à la certification des apprenants. Le programme s'étend sur deux ans et pourra faire l'objet d'une évaluation à la fin de l'année 2018.

Si l'on compare l'Allemagne à d'autres pays, celle-ci a connu ces dernières années peu d'initiatives descendantes et beaucoup d'initiatives ascendantes. Ceci est la conséquence d'une politique allemande qui a largement négligé le sujet des REL jusque récemment. Mais la situation a depuis évolué. La plupart des initiatives étant ascendantes, les acteurs ont eu, et ont toujours, un grand besoin d'échanger sur leurs questions, leurs expériences et les outils. Surtout les acteurs travaillant parfois de façon isolée dans leurs propres institutions. Ces acteurs et ces initiatives ont su trouver des opportunités au travers d'événements et de communautés au-delà de leur domaine. En particulier, le format de BarCamp ou de non-conférence s'est montré très efficace pour développer une communauté forte en Allemagne pour les REL. Dans ce contexte, au-delà de la présentation des initiatives du terrain, une attention toute particulière est portée aux échanges au sein de la communauté (voir Chapitre 7).

Il est intéressant de remarquer que le programme de financement OERinfo fonctionne bien, indépendamment des décisions politiques futures en matière de REL. Si la décision d'ancrer plus profondément les REL était prise, en répondant aux besoins urgents d'infrastructure et de matériel nécessaire à son développement, OERinfo serait le point de départ idéal pour un programme plus ambitieux (voir Chapitre 8). Si au contraire, aucun soutien financier supplémentaire ne devait venir, OERinfo tiendrait un rôle toujours aussi central puisque les diverses initiatives de sensibilisation et d'échange de bonnes pratiques participent sans aucun doute à l'accroissement du nombre d'utilisateurs des plateformes et outils existants.

L'analyse des mesures prises en Allemagne pour les REL livre au moins quatre éléments centraux pour d'autres pays.

- Il ressort des discussions générales sur la mise en place effective des stratégies et des pratiques de formation, une maturité des pratiques liées aux REL. Les REL sont d'ores et déjà prises à leur juste considération dans la présente discussion. Pourtant, leur potentiel est encore bien plus grand et décrit dans les documents centraux.
- Il existe dans de nombreux pays un nombre significatif d'acteurs REL. Les gouvernements peuvent mettre en place des mesures politiques pour les soutenir et leur donner l'opportunité d'échanger sur leurs savoir-faire et bonnes pratiques.
- La clarté sur les questions de droit d'auteur reste une condition générale importante de développement des REL et du développement de la formation numérique en général. Les incertitudes juridiques demeurent, avec ou sans utilisation des REL. A contrario, la situation juridique confuse concernant la législation sur le droit d'auteur en Allemagne peut être considérée comme un moteur de l'adoption des REL. Plus la législation faillit à fournir des solutions praticables pour l'utilisation du potentiel des nouveaux medias, plus les REL semblent une alternative valable.
- Les informations quantitatives et qualitatives, la coordination, et la recherche sont des éléments cruciaux pour les réformes de l'éducation tout comme pour les REL. Dans ce contexte, les auteurs souhaitent attirer l'attention sur les informations mises à disposition par la carte mondiale des REL. Cette carte mondiale des REL (OER World Map) devrait être un outil exploité par d'autres pays pour pleinement rendre compte de leurs activités. Cependant, cela ne suffit pas. L'évaluation spécifique des programmes et des pratiques est essentielle. Et il est regrettable que le programme de financement OERinfo, qui est tout à fait satisfaisant dans son ensemble, n'ait pas prévu de tels engagement pour les porteurs de projets de fournir ces éléments dans les délais de la période de financement. Les auteurs espèrent que d'autres pays prennent part à cette importante évolution de management du changement.

1 Introduction: between two World Congresses

The first World Open Educational Resources (OER) Congress took part 2012 in Paris. Fred Mulder, emeritus UNESCO Chairholder for OER from the Open University Netherlands, posed the poignant question at the Congress: "But where is Germany?". It was characteristic for the state of development at the time — the German OER movement was hardly detectable.

It is quite interesting to have another look at the major document of the first World Congress — the OER Paris declaration. When comparing it to the developments in Germany, it is easy to notice, that for each of the ten recommendations mentioned in the declaration you can find examples in this report — for some more, for others less.

Open Educational Resources have the potential to improve societies in multiple ways. UNESCO supports OER, because it provides access to high quality education and is therefore key to realising Sustainable Development Goal 4. In this, education is defined as a key driver: "…to reduce inequalities and to reach gender equality. It also empowers people everywhere to live more healthy and sustainable lives. Education is also crucial to fostering tolerance between people and contributes to more peaceful societies."[1]

When looking at the pathways the introduction of OER took in different countries, it can be seen that they sometimes significantly differ and that often the actors associate different benefits with the introduction of OER. For example, in the United States one of the main drivers of OER initiatives have been the aim of saving costs for educational materials, which otherwise might hinder students finishing their degrees.

Germany sets different priorities. Germany can be typified as a country, which sees OER as having an implicit potential to foster innovation in the field of education. Despite this focus on innovation in education, this report will hardly look at didactical practices, because whilst Open Educational Practices are a frequently discussed topic in the German OER movement, little systematic information is available on implemented practical examples.

This report focusses strongly on policy questions related to OER. It tries to answer questions like "What happened?", "Who made it happen?", "Why did it happen?" as well as "What were the results?". Other perspectives, which are equally necessary to develop a holistic understanding of OER, like the technical perspective, the legal perspective, the social perspective and also the already mentioned, the very important didactical perspective are included only if necessary for the understanding of the policy-related questions this report mainly tries to answer.

The authors of the report have participated in numerous OER-related projects in the last few years, which provided them with the possibility of observing many of the often dynamic developments at first hand. They also had the privilege to discuss the complex and diverse issues related to OER and Open Education with many of the most knowledgeable experts in the community in Germany and abroad. Nevertheless, the authors approached the overall system from different positions such as educational policy analysis, grassroots community development and communications as well as government administration. By bringing these experiences together, they hope to be

[1] http://www.un.org/sustainabledevelopment/education/

able to provide an albeit incomplete, but at least all round representation of the German OER movement as it has developed during the last five years.

The report does not claim to be complete, neither does it claim to be completely objective. The authors sympathize with the concept of Open Education and have been supporting its uptake in different ways. Two of the authors are also participating in the current OERinfo website project, which is one of the central projects of the ongoing OERinfo funding programme. The authors have tried to handle this conflict by transparently addressing their own bias, where appropriate. All critical passage, which include self-referential explanations, i.e. related to the OER World Map project or the OERCamps, have been critically discussed internally.

Following an approach of evidence-based advocacy, the authors provide a perspective that combines qualitative and quantitative methods. At its core, the report is made up of a qualitative description of the current state of development, which is based on thorough literature research supplemented by observations the authors collected from the multiple projects, events and discussions they participated in.

A quantitative approach, based on data about the OER movement collected by the OER World Map project, is used to substantiate the arguments. Indeed, the entries in the OER World Map are used in two ways for this report. On the one hand, Chapter 5 of the report includes statistics derived from the OER World Map. On the other hand, the electronic version of this report will include links to the respective OER World Map entry, whenever an organisation, a service, a project or a report is mentioned within this report.

From a scientific publishing perspective, the report is directly built on top of underlying primary data. Thus, the authors hope to assure the reliability and robustness of the report. In the long run, the hope is that this approach will contribute to increasing the quality of OER policy-making and that many other countries will follow this path in the future.

The report uses the following structure: Chapter 2 gives a short overview of the OER related developments in Germany. Chapter 3 outlines the German education system, which is important information necessary to understand the relevance of the current debates in Germany in the following chapter. The organisation of the education system can and does frame the development of OER policies and the uptake of OER practices. Chapter 4 will explain the main educational challenges, show recent and expected government activity in the field of digitalisation of the educational sector, show how legal aspects are influencing the discussion and summarise the most important reports, which have supported the uptake of OER.

In Chapter 5, a quantitative overview of OER activities in Germany will be given before in Chapter 6 and 7 existing organisations, services and projects will be introduced. While Chapter 6 focusses on top-down policy-led activity, Chapter 7 gives an insight in the various bottom-up initiatives, which developed in the last five years. Finally, Chapter 8 offers an evaluation of the overall developments in Germany and possible next steps.

The second World OER Congress has the motto "From commitment to action". This report aims to provide examples and insights relevant to the question of how the transition from commitment to action can be achieved. The authors hope that the second World Congress will encourage many countries to increase their commitment to OER, just as the first World Congress inspired many to become active.

2 Overview of OER-related developments in Germany

This section presents an overview of developments in the form of a timeline, with comments on central developments. It provides a first insight into the German OER landscape.

2.1 Key points and milestones

- Germany can be described as a late-comer to OER. With rare exceptions, the international debate was largely ignored in Germany during the early years of OER.
- Legal issues have been important for developments in Germany (see Section 4.4). Late 2011 things changed when some bloggers and practitioners publicised details on a leaked agreement between textbook companies and the administration on the use of copyrighted materials in schools. A software was going to be installed on school computers to search for illegal copies of the publishers' contents — this was termed the 'School trojan virus' because of how it would be introduced ("Schultrojaner"). A community against this practice and for the open use of learning materials was initiated and it organised various annual events. This community was formed by diverse actors from different educational sectors and institutions.
- Late 2013 a working group was set up by the educational administrations of the 16 German Länder and the federal ministry. They published a position paper in January 2015 outlining first policy measures for Germany. The paper was largely supportive of OER, although the policy focus was on compliance and quality assurance. Other strategy documents in the context of digitalisation and education began to frequently refer to OER as a key element (see Section 4.2).
- 2016 Germany saw the first funding programme for OER on federal level. With 'OERinfo' Germany would now have funding for a central information hub and 23 activities from different educational sectors (see Section 6.6). The central aim is to raise awareness and build capacity through train-the-trainer exercises.

2.2 Timeline

Table 2.1: Timeline of key activities related to OER in Germany

Date	Headline	Short description
1999/ 2001	OpenCourseWare movement	The OpenCourseWare (OCW) project by the Massachusetts Institute of Technology (MIT) promotes the idea of OER from 2001 on. Though the project initially does not use the term OER itself, it makes the university's digital teaching and learning materials freely available and sorted into courses. Though no institutions from Germany are active in the OCW project directly, the University of Tübingen, Germany, had also started offering OER-like materials.

Date	Headline	Short description
Oct 2011	"Schultrojaner" (rough translation: School Trojan Horse)	The software programme described as "Schultrojaner" creates excitement in the (edu-)blogger world, but also in the media in general. The programme was supposed to examine school computers for works protected by copyright. (To date, 2017, the plans have not been implemented.) The reason for this is a new contract between copyright holders and the 16 German states. Shortly after that an online debate arises on OER as an alternative to the schoolbook publishing houses, which provide learning materials.
Apr 2012	First white paper on OER for Germany	The think tank Internet & Gesellschaft Co:llaboratory publishes the first white paper on OER for schools in Germany.
Jun 2012	Paris Declaration	In Paris, the first OER World Congress takes place and publishes the Paris Declaration on OER. There is no high-ranking delegate from Germany present.
Sept 2012	First OERcamp	The first OER-focussed (un)conference in Germany: the three-day OERcamp is held at the University of Bremen, initiated by Jöran Muuß-Merholz and organised by Internet & Gesellschaft Co:llaboratory in cooperation with the University of Bremen, EduCamp e.V. and the Agency J&K — Jöran und Konsorten.
Nov 2012	Hearing of experts on federal level	The German Federal Ministry of Education and Research calls a hearing of experts on OER in Berlin. Almost 20 experts discuss the diverse dimensions of OER. The state of debate is also discussed by the Commission on educational media programmes (Gemischte Komission Schulfunk/Schulfernsehen KMK/ARD ZDF/ DLR).
Sept 2013	First textbook for schools under CC BY-SA	The first schoolbook using Creative Commons licencing 'Biologie 1' is introduced. For the project "Schulbuch-o-mat" Heiko Przhodnik and Hans Hellfried Wedenig raised 10,000 Euro via crowdfunding. Part of the book is based on OER-materials from the US foundation CK-12.
Apr 2013	COER13 — the first MOOC[2] on OER as OER	COER13 launches an open online course on OER. COER13 is an international cooperation project by e-teaching.org, Patricia Arnold (UAS München), Martin Ebner (TU Graz, L3T), Andreas Link (Learning Agency Network, Brussels), Johannes Moskaliuk (Univ. Tübingen) and Sandra Schön (BIMS e.V., L3T).
Sept 2013	First Conference on OER, together with the 2nd OERcamp	The conference 'OER Konferenz 2013 — Freie Bildungsmaterialien in Deutschland' offers both a curated conference and an OERcamp to promote the use of OER in German education. The event host: Wikimedia Germany.
Nov 2013	Declaration of the German Federal Council on EU-initiative 'Opening Up Education'	The German Federal Council (Bundesrat) expresses its position regarding the EU-Initiative 'Opening Up Education' and with that also on OER. It is cautious.
Nov 2013	OER in the coalition agreement on federal level	The coalition agreement contract adopted by the new governing parties CDU, CSU and SPD mentions OER indirectly in the section on digital education.
Jun 2014	Announcement of OER for Berlin Project	The Berlin administration officially announces the launch of the project 'Open learning materials for Berlin'.

[2] MOOC — Massive Open Online Course

Date	Headline	Short description
Nov 2014	2 million Euro for OER support foreseen in the federal budget 2015	A clause stating "More funds for open teaching and learning materials as well as open learning software (OER)" is included in the draft for the federal budget in 2015 and eventually agreed upon.
Nov 2014	Hamburg Open Online University is launched	Mr. Olaf Scholz, the Mayor of Hamburg, presents the concept of the 'Hamburg Open Online University'. In essence, this is a platform, which offers digital tools and courses based on OER, bundling activities of six Hamburg universities.
2014	Formation of the Alliance for Free Education	The Alliance for Free Education (*Bündnis freie Bildung*) is founded to promote open learning materials, it is initiated by Creative Commons, the Open Knowledge Foundation Germany and Wikimedia Germany.
Jan 2015	OER report from a working group from BMBF and KMK	The Federal Ministry for Education and Research (BMBF) and the Standing Conference of Standing Conference of the Ministers of Education and Cultural Affairs of the *Länder* (KMK) publish a paper on OER. It has a positive tone and recommends some short- and medium-term measures. The working group of BMBF and KMK was established in September 2013.
Apr 2015	Start of study 'Mapping OER'	Wikimedia Deutschland launches an OER mapping project (Mapping OER — *Bildungsmaterialien gemeinsam gestalten*), funded by the BMBF.
May 2015	White paper for OER in Higher Education	The White paper 'OER in Higher Education in Germany' (Open Educational Resources (OER) *an Hochschulen in Deutschland*) is published.
Feb 2016	Feasibility study on development and operation of OER infrastructures	A feasibility study on development and operation of OER infrastructures is published (*Machbarkeitsstudie zum Aufbau und Betrieb von OER-Infrastrukturen in der Bildung*). It was commissioned by the BMBF, and recommends connecting existing structures, rather than building news structures.
Feb 2016	Study 'Practical framework for OER'	Publication of the Practical Framework for OER as outcome of 'Mapping OER'.
Feb 2016	OER-Atlas 2016 published	The OER-Atlas 2016 is published and printed — 102 pages on the German-speaking OER landscape.
Apr 2016	Commitment to OER as default by the German educational servers	The German educational servers (*Bildungsserver*; platforms for educational media, run by the states and one run on a federal level) publish a commitment to OER.
Nov 2016	Start of OERinfo	The federal funding programme 'OERinfo' begins. The (formerly privately operated) 'Transfer hub for OER' is migrated and its scope widened as a publicly funded information hub. 24 publicly funded projects take up their activities on OER, raising awareness and training trainers.
Nov 2016	German Rectors' Conference release positive position paper on OER	Heads of German higher education institutions (HRK) release position paper highlighting the innovative potential for Open Educational Resources to improve teaching and learning.
Dec 2016	Digital Education strategy by KMK mentions the role of OER	The strategy paper by the KMK entitled 'Education in the Digital World' sees OER and other digital formats as equivalents to traditional educational media.

3 German education system

Germany has a federal structure, which leads to a different distribution of tasks and responsibilities for each of the educational sectors. This therefore affects both how OER-related reforms can be initiated and supported.

3.1 General organisational structure and division of responsibilities

The Federal Republic of Germany has a population of roughly 80 million. The republic is a federation of sixteen states, called *Länder* (singular *Land*), five of which were joined to the Federal Republic after the breakdown of the German Democratic Republic in 1990.

Educational legislation and administration of the education system are primarily the responsibility of the *Länder*. This particularly applies to the school system, higher education and the further education sector. The heads of the ministries for education assemble regularly in the Standing Conference of the Ministers of Education (*Kultusministerkonferenz*, KMK) for coordinating purposes. The Conference aims to create and preserve comparative standards and practices across all *Länder*, and it represents the collective interests of the *Länder* to other stakeholders. It sees itself as covering four roles:

- assuring uniformity and comparability of certificates and degrees as a prerequisite for mutual recognition;
- protecting quality standards in schools, vocational training and colleges;
- facilitating cooperation between institutions of education, science and culture;
- supporting coordination through decisions, recommendations, agreements or also state agreements (Decisions must be adopted by the individual countries as national legislation).

  "In cross-country questions, the *Länder* provide the necessary degree of common ground in education, science and culture ... In the sense of the desired diversity in the education system, detailed rules are avoided to leave room for innovation."[3]

On the federal level, the Federal Ministry of Education and Research (*Bundesministerium für Bildung und Forschung*, BMBF) has a mandate to support scientific research and company-based vocational training, but also to support national matters of higher education development. The ministry offers a host of programmes in support of research activities involving HEIs and other institutions.

The scope of the Federal Government's responsibilities in the field of education is defined in the Basic Law, which gives the Federation responsibility for the regulations governing the following domains of education, science and research:

- company-based vocational training and vocational further education;
- employment promotion measures as well as occupational and labour market research;

[3] From organisation's website: https://www.kmk.org/kmk/aufgaben.html

- admission to higher education institutions (HEIs) and higher education degrees (here the *Länder* may enact laws at variance with the legislation of the Federation);
- financial assistance for pupils and students;
- promotion of scientific and academic research and technological development, including the promotion of up-and-coming academics;
- youth welfare (in particular early childhood education and care in day-care centres and child-minding services);
- legal protection of participants in correspondence courses;
- regulations on entry to the legal profession;
- regulations on entry to medical and paramedical professions.

Concerning vocational education and training, whilst the Federation is responsible for company-based vocational training, the *Länder* are responsible for vocational education in schools. This means that for vocational education and training within the *duales System*, which takes place in cooperation between school and company, the Federation and the *Länder* have to agree on fundamental issues and in particular on training rules and regulations for the learning locations.

This requires strong coordination between federal and state levels. Within the Federal Government, the relevant ministries according the particular occupational field adopt, in agreement with the Federal Ministry of Education and Research, training regulations. These are developed by the Federal Institute for Vocational Education and Training (*Bundesinstitut für Berufsbildung* — BIBB) based on guidance from the competent ministries and according to the participation of representatives of employers and trade unions. These training regulations are then compared to the framework curricula for subject teaching at vocational schools simultaneously developed by the *Länder* and adapted. The process is developed based on the consensus principle where major decisions on structure and substance have to be taken through a joint effort by Federation and *Länder*, employers and employees.

In general too, there are provisions in the Basic Law for particular forms of cooperation between the Federation and the *Länder* within the scope of the so-called joint tasks. These joint tasks have to be agreed consensually and usually involve the Federal Government providing funding for infrastructure, whilst the state level (*Länder*) focus on didactic reforms and the related reforms to the teaching and learning environment. A good example of this is the Digital Agenda for education mentioned below.

Similarly, the Federal Government's influence on matters of higher education has changed over the years. In 2006, an amendment to the country's Basic Law (its constitution) was passed limiting federal state support for HEIs to include only scientific projects and research. Nevertheless, federal funding does play a role in supporting German higher education and so the Federal Government has retained some influence on the higher education system as a whole. Recently it has also supported the provision of higher education directly, for instance by providing co-funding for additional study places in a multi-year programme called the Higher Education Pact 2020 (*Hochschulpakt 2020*).

The heads of German universities are organised in the German Rectors' Conference (*Hochschulrektorenkonferenz*, HRK). The Conference publishes policy papers on various matters of the HEI system, in which it tries to define common positions represented by the diverse set of member HEIs. The Conference also runs projects supporting the reform of German higher education.

3.2 Organisation of teaching and learning media

As education is a decentral responsibility of each of the *Länder*, it follows that each of the *Länder* also has a platform for teaching and learning media. These so-called *'Bildungsserver'* contain the following resources for teaching staff:

- Teaching plans and guides
- Quizzes and tests
- Lesson materials organised by subject area and by educational sector
- Descriptions of project initiatives for improving teaching and learning
- Discussion forums for communication and exchange

They also provide a general digital infrastructure for educational media, including:

- Providing information on digital education
- Publishing curricula and learning resources
- Curating learning resources
- Providing communication and cooperation platforms
- Connecting schools and other educational institutions
- Providing educational databases

In addition to the 15 *Bildungsservers* of the *Länder* (Berlin and Brandenburg share a platform making 15 platforms for 16 *Länder*), the national education platform (*Deutscher Bildungsserver*) aims to pool resources provided by the different *Länder*. It is provided by the German Institute for International Educational Research (*Deutsche Institut für Internationale Pädagogische Forschung*, DIPF) in cooperation with the national Institute for Film and Pictures in Science and Education (*FWU Institut für Film und Bild in Wissenschaft und Unterricht*). The national education platform provides, for instance, the joint educational search engine Elixier.

Learning materials are increasingly using the new digital opportunities. This led the managers of the 16 educational platforms to formulate a voluntary commitment to OER in 2016 (see Section 6.2.1).

4 Current debates in the German education system relevant for OER

This paper starts out from the assumption that educational reforms are likely to be initiated based on the identification of specific problems in educational process and outcomes and heavily influenced by reform programmes in other societal areas. However, reform programmes seldom start out from one set of problems (Peters, 2002), they are influenced by developments and debates outside of education — in this case industrial reform policy — and one development strand (here: OER) is often coupled with others — in this case digitalisation of education in general. This chapter reviews the challenges and discussions in the German education system, which are linked to and shape the reception of OER within the system.

4.1 Key insights

In the case of Germany, the educational challenges are predominantly the increasingly diverse paths through the educational system, which present challenges for teaching and learning (e.g. requirement of special support for certain groups) (see Section 4.2).

The reform programme from outside of the educational sector with the largest influence is the debate on digitalisation in industry and services — termed 'Industrie 4.0'. This has led to both the federal and the state levels developing their digital agendas, which include educational reform and frequently see OER as part of this (see Section 4.3).

A further link is the challenge of copyright law, which creates confusion in Germany. Some argue, therefore, that this situation has been fruitful for the reception of OER as a (partial) solution to this (see Section 4.4).

At the same time, advocates of OER have published supportive and constructive evaluations of the value of OER (some funded by central government), which began to feed into the policy discussions in 2016 (see Section 4.5).

A point of note is that the decentral structure of education in Germany (which is also coordinated slightly differently for each educational section — see Chapter 3) means that policy action may, in fact, lag policy intentions somewhat. An example of this can be found in the delays currently found in implementing a cross-government pact supporting digital education (see Section 4.3.3). In the context of OER, private discussions of the authors of this report with policy-makers suggest that many people's individual opinion on the value of OER for educational reform is more elaborated than the picture presented in this chapter, which focusses on published policy documents.

4.2 Main educational challenges in Germany

Every two years, the German government publishes a report entitled the German Education Report, which looks at key topics and key developments in the German education system. It is a joint publication by the Standing Conference of Ministers and the Federal Ministry of Education and Research and is authored independently by a joint experts group from various educational research agencies.

In its most recent publication (Autorengruppe Berichterstattung, 2016), it highlighted challenges in each of the educational sectors.

- In early childhood education, the report notes the expansion of the sector, which the authors support. They point to the need for more qualified staff to assure the quality of childcare provision.
- In secondary schooling, they highlight the decline of the three-tier schooling system (academic, vocational and lower vocational schools) and the increase in pupils being taught in multi-stream schools. This change has risen out of school mergers, with a growth from 17% of secondary school pupils in such schools in 2000 to 26% in 2014. This development is welcomed, but it also means that there is a growing need for more individual support of pupils.
- At the transition point between upper secondary and higher education, there has also been a growing number of school leavers qualifying for higher education entry (*Abitur*). This is due to an expansion in the number of pupils obtaining the qualification via the academic route (Grammar school) and a diversification of routes to obtain this qualification. Around one third of those with the *Abitur* has graduated via a vocational route. Furthermore, additional routes into higher education have been provided in the last decade to give people a second chance of entering HEI. These include alternative routes especially open to people without the normally required secondary school leaving qualifications but with vocational training and experience (Nickel & Duong, 2012; Nickel & Schulz, 2017). However, even after these new laws and initiatives, only 3% of all entrants to higher education have entered higher education without the *Abitur*, predominantly, but not only enrolled in the university of applied science sector (*Fachhochschulen*). This overall expansion and diversification has led to challenges particularly for the entry phase in higher education, with HEIs offering bridging course and counselling and support to facilitate students' progression through their study programme.[4]
- For lifelong learning and greater inclusion of people with low formal skill levels, the report notes the role of the education system in finding new forms of recognition to get low-qualified people back into the formal education system.
- This search for new paths into formal education and new forms of recognition is also viewed as important for the substantial number of asylum seekers who entered Germany within the last few years and in many cases have been subject to interrupted or broken educational pathways.
- Overall, the report also highlights the need to offer continuous professional, pedagogical training and development within the educational sectors. This is important in the early childhood education sector because of its current growth, in secondary schooling because of the high average age of teachers, in higher education because of the increasingly important role given to didactics and teaching and in further education because of the fragmented field and heterogeneity of practitioners.

4.3 Digitalisation and the education sector – a new agenda

The Digital Agenda is a topic currently shaping government policies, strategies and interventions at all levels in Germany. The table below shows which German states have such a policy document at present and whether education is featured as an issue. In general, all German states and the Federal Government either already have such a policy document or are in the process of developing it, with some initial results in autumn 2017.

[4] An example of this can be found in Lower Saxony, where the initiators have also been active in the OER scene. Their OER World Map entry is here: https://oerworldmap.org/resource/urn:uuid:17868940-faed-4dbd-a20a-8afe3d201ced

Table 4.1: Comprehensive digital strategies at state level

German state	State programme	Dates (date of launch)
Baden-Württemberg	digital@bw (Digital BW)	December 2016
Bavaria	BAYERN DIGITAL; Masterplan Bayern Digital II	2013
Berlin	Digitale Agenda (Digital agenda)	December 15
Brandenburg	*(no overall strategy)*	
Bremen	Digitalisierungsstrategie (Digitalisation strategy)	November 16
Hamburg	Digitale Stadt (Digital city)	January 15
Hesse	Digitalstrategie Hessen (Digital strategy Hesse)	2016
Lower Saxony	digital.niedersachsen	2016
Mecklenburg-Vorpommern	*(no overall strategy)*	
North-Rhine-Westphalia	#dwnrw (Digital commerce NRW)	2015
Rhineland-Palatinate	Digital-dialog (Digital dialogue	2017
Saarland	*(no overall strategy)*[5]	
Saxony	Sachsen Digital (Saxony Digital)	January 16
Saxony-Anhalt	Digitale Agenda (Digital agenda)	June 16
Schleswig-Holstein	#digagendash (Digital agenda SH)	December 16
Thuringia	Wirtschaft 4.0 (Commerce 4.0)	March 16

At the same time, the strategies have tended to focus on digitalisation and commerce, rather than transformations in civil society and education, especially the ones before autumn 2016. This is also the conclusion of the lobby group for digital transformation called Bitkom, which represents 2,500 firms in Germany, but also argues for a holistic digital strategy (Reuter, 2017).

4.3.1 Collective digital education strategy of the German states

At the end of 2016, the Standing Conference of Education Ministers published a position paper, which set down the view of the KMK on what belongs to the digital agenda for the German education sector (Sekretariat der Kultusministerkonferenz, 2016). The strategy document starts out with the argument that digital technologies facilitate access to near inexhaustible information almost anywhere and anytime; they open new possibilities for communication and new opportunities for social participation. Based on this understanding, the strategy document then goes on to outline an approach to harnessing digital technologies for better teaching and learning and for an active social participation within the digital world.

- The school sector is seen as providing the basis for every pupil's self-determined participation in a digital world. The paper sets two specific goals. From the school year 2018, all pupils will be able to acquire digital competency skills, which are considered a new fundamental cultural tool, alongside reading, writing and

[5] A "Council on Digitalisation" was initiated in October 2016. This may lead to a digital strategy.

arithmetic. A full skills profile is laid out covering six areas: searching, modifying and saving; communication and collaboration; production and presentation; protection and safety; problem-solving; analysis and reflection. This will be facilitated through the use of competency-orientated educational standards, which leave more room for innovation in teaching and learning processes. Furthermore, by 2021 every school pupil will be able to access a digital learning environment at any time. This learning environment will provide new opportunities for pupils to collaborate with other pupils and for teachers to support and accompany pupils' learning.

- The goals are similar for vocational education. However, the paper emphasises the need for a closer integration of direct requirements in the labour market. New processes are being used for production and delivery of products and services and graduates of vocational education need an adequate set of skills, which allows them to flourish in this environment. These include being able to use digital tools and work processes; having developed self-management and self-organisational skills; thinking and working internationally and interculturally; cooperating and collaborating with others; understanding and applying data safety and security; and being sensitive and reflective on the impact of digitalisation and digital media on work and people's lives. Further education and training (lifelong learning) has the task of providing the same set of skills to people already in the labour market.[6]
- Higher education is given a similar role in the sense of supporting students in the development of these digital skills, but also researching and developing new ways to harness the benefits of digitalisation, whilst reflecting on the disadvantages and how these can be overcome.

Common to all four sectors are the following expectations:

- There is a need for additional capacity-building for teaching staff to enable them to harness the new possibilities provided by digital media, but also to understand the technical and legal requirements for sensible use. For the school sector, providing appropriate teacher training can be part of the so-called Quality Initiative — Teacher Training 2019-2023. For higher education, it can be part of the so-called Quality Pact, which supports the higher education completion agenda.
- Learning materials can also be developed more collaboratively than in the past and methods for sharing best-practice examples and perhaps using common platforms for sharing materials should be identified — both at Länder-level, but also at national level, including the idea of a learning cloud.
- Quality assurance for learning materials remains important. Digital media should contain the appropriate metadata and quality evaluations to facilitate appropriate usage, e.g. with alignment to the education standards in the school sector.
- None of the above can be achieved without additional funding for the provision of the appropriate infrastructure and technical support, and funding for so-called 'lighthouse'-projects, i.e. projects of excellence, which are expected to help motivate other educational institutions to adopt innovative practices.

Treatment of OER — limited expectations

Before publication of this strategy, the KMK and BMBF had set up a working group with a focus on OER. This working group was launched in September 2013 to look into the potential for OER for improving teaching and learning and reported on their results in January 2015 (*Kultusmininister Konferenz & Bundesministerium für Bildung und Forschung*, 2015).

[6] More specific recommendations for lifelong learning are being developed by a working group and are expected to be published at the end of 2017.

However, the KMK strategy paper does not mention the innovative potential. Instead, it states for instance:

> "(...) [Digitalisation] has led to a rapidly growing volume of educational media, which are made available in different licensing formats, from commercial media to open-licensed media. The term "Open Educational Resources (OER)" has been coined by UNESCO for the latter."

In this context, the following two challenges are mentioned:

- Existing resources for improving teaching and learning, which can be used by, but need to be made discoverable for teachers and learners
- A legal challenge in the context of simplifying copyright rules, which will be further worked on by the KMK (see Section 4.4).

However, indirectly the strategy paper does appear to have been influenced by the various papers drawn up on OER in Germany in the previous years (see Section 4.5). A review of the strategy by the so-called Alliance for Free Education (*Bündnis freie Bildung*) highlighted the following:

> "In the section on education media, the 'breaking up of the linearity of production, distribution and use of media' is stated, 'so that every useful person and thus also pupils as well as teachers can develop and distribute media themselves.'" (*Bündnis Freie Bildung*, 2017)

4.3.2 Federal government strategy

A major strategic document from the Federal government on digitalisation in all societal spheres is the Digital Agenda, setting areas of work and priorities from the period 2014-2017. This document sets out seven areas of work:

1. Digital infrastructure — high quality broadband provision across the country and public institutions
2. Digital economy and digital workplace — supporting start-ups and entrepreneurs, but also on preparing and supporting the transformation of workplaces
3. Innovative public administration — facilitating better access to public services via digital solutions
4. Shaping digital environments in society — dialogue and support to enable all parts of society to benefit from the advantages of digitalisation
5. Education, science research, culture and media — harnessing digital opportunities for improving teaching and learning, making knowledge more accessible to wider parts of society through digital solutions, and providing appropriate education and training to enable citizens to make use of digitalisation for better work and better lives
6. Building security, protection and trust within society and the economy — cyber security and data privacy
7. European and international dimensions of the Digital Agenda — digitalisation is a worldwide process and therefore new regulations and discussion processes are necessary on European and international levels. Germany aims to be more actively engaged in these processes.

Treatment of OER — growing recognition

It is of note that this document mentions open data, open source and open access, but does not mention open educational resources. However, it does mention frequently in the text that knowledge should be made freely available "in a way that does not infringe copyright", which could equally be applied to the use of OER.[7]

[7] A similar formulation was already used in the Coalition Contract between the leading political parties (CDU, CSU, & SPD, 2013).

A further central document is the "Educational Initiative for a Digital Knowledge Society", which was launched on the back of the Digital Agenda by the Federal Government's Ministry for Education and Research (Bundesministerium für Bildung und Forschung, 2016). This document takes a more strategic look at the Agenda and adds new developments to it. It also has the clear goal to lay out opportunities for synergy effects between this document and the strategy of the *Länder*, as formulated in the KMK document (see above).

In particular, it is now very clear that OER are expected to facilitate the improvement of teaching and learning through harnessing digital opportunities:

> "An important tool for tailor-made education is Open Educational Resources (OER) — teaching and learning tools that can be — depending to their specific licencing — used, adapted and distributed without restriction, and which are of particular relevance for learning with digital media. We are convinced that the range of teaching materials can be significantly expanded through OER. This requires an OER-conducive infrastructure with a meaningful combination of repositories, referatories and the appropriate metadata services and metadata standards, legal certainty (in terms of use, combinability and further development), user-friendly licensing systems, well-founded didactic concepts and suitable business models."

4.3.3 Awaiting a new Digital Pact

So, the Digital Agenda of the Federal Government and the KMK paper are expected to lead to much new activity in reforming education. Currently, the planned Digital Pact between the Federal Government and the states is not yet agreed, which means that the five billion Euros offered by the Federal government to this programme cannot be spent. Due to the national elections in the autumn 2017, this process will be delayed. However, a joint paper (from May 2017) has already been published setting out the cornerstones of further discussions and it is expected that agreement will be reached quickly following the appointment of the new Federal Government later in 2017.[8]

This joint paper remains reserved in relation to OER. The seven-page paper mentions OER twice:

- Measures should be launched to improve the dissemination of OER
- New quality assurance mechanisms should be developed for digital media and OER

4.3.4 Higher education forum on harnessing digitalisation

Digitalisation is an area in which higher education institutions are active. A quantitative survey from summer 2016 covering 200 HEIs in Germany found that nearly three-quarters of HEIs are using digital media strategically to enrich their teaching and learning. Nearly half see digital provision as a means to increase the quality of teaching and learning, better balance family and study commitments and improve support and programme completion. However, the president of the German Rectors' Conference concluded from the study that there is much activity, but more strategic development, supported by public investment, would be necessary (Hochschulrektorenkonferenz, 2016).

An important initiative is the Forum for Digitalisation in Higher Education, which has been funded by the Federal Ministry for Education and Research since 2014 and led by Hochschulrektorenkonferenz, a think tank for higher education (*Centrum für Hochschulentwicklung* (CHE)) and a coalition for trust funds and industry active in education (*Stifterverband*). This Forum has been organised as a participative process with around 70 experts meeting regularly in working groups. This Forum reported at the end of 2016, after its first cycle.

[8] This document has not been published, but was made available to the authors.

Amongst the recommendations, the Forum paper emphasises the collective development of teaching and learning materials and their publication as OER (Hochschulforum Digitalisierung, 2017):

> "the Digital Turn *[i.e. harnessing digital technology — the authors]* allows and requires HEIs to work together more — this ranges from jointly preparing and using teaching material to jointly offering entire courses of study that cannot be covered by one HEI on its own. In the form of higher education networks, digital courses can be opened up to students of other HEIs that recognise these courses accordingly."

For this, the paper recommends that programmes to support the development of such materials and that these should be released as OER should be established at the federal level (ibid):

> "…new teaching content created as part of the programme should be available as OERs under free licence. Only in this way can the newly created materials be further used, adapted and improved by all interested parties in a legally compliant way."

4.4 Related legal regulations

OER is a topic with strong legal references, which touches different legal fields. This is particularly the case in Germany and discussion of these regulations has influenced the reception and acceptance of OER in the educational sector. The two main regulations of note are the copyright law and the data privacy law.

4.4.1 Copyright law

Copyright issues are regulated by the Act on Copyright and Related Rights (*Urheberrechtsgesetz*, UrhG)[9]. The regulation was enacted back in 1965 and has been described as requiring fundamental restructuring to cope with the developments accompanying the emergence of Information and Communication Technologies (Kreutzer, 2008). Despite this, attempts of profound change are lacking. Instead, several adjustments have been implemented, although these have been criticised for being both not far reaching enough, as well as causing legal uncertainty due to imprecise and unrealistic regulation.

Like other copyright acts, German intellectual property law aims to balance the interests of authors and the public to foster continuous and dynamic development in the fields of science, culture and arts. The basic mechanics of the regulation follow a 'rule and exception' logic: while the author in principle holds all rights, the public gets access within a framework of limitations (*Urheberrechtsschranken*) constituted in chapter six of the German Copyright Act.

An important role is played by the collective management organizations (CMOs), which facilitate the exercise of copyrights by concluding licenses and collecting royalties for authors and producers. There are a number of different CMOs, amongst them the 'Society for musical performing and mechanical reproduction' (GEMA) for musical works, the 'VG Bild-Kunst' for fine arts including photography, and the 'Utilization Company Word' (VG Wort) for written or recorded works of speech.

This combination of a fast-changing environment, outdated legal code, multiple stakeholders having to negotiate easy solutions for complex issues framed by sometimes highly ideological conflicts and frequent interventions by courts has resulted in an almost stasis, which causes general frustration. A good example of this can be found in

[9] An English translation can be found at: https://www.gesetze-im-internet.de/englisch_urhg/index.html

the current development related to paragraph 52a of the Act on Copyright. The section was enacted in 2003 and provides teachers with the right to "publish small, limited parts of a work [as well as] small scale works [...] exclusively for a specifically limited circle of those taking part in the instruction". The most relevant practical application of this paragraph is the use of media in Learning Management Systems (LMS).

But while in the universities teachers started working based on the new regulation, VG Wort and the *Länder* never reached an agreement about the particular use of subject matter in universities and its remuneration. Key to the dispute was that the VG Wort claimed recording and reporting of individual acts of use and accordingly individual remuneration for each use. The *Länder* on the other hand claimed that such a model would be too expensive and therefore not feasible.

As a preliminary workaround, the payment of lump sum fees was agreed, but no real compromise was found, despite extended negotiations, several legal proceedings and a pilot project, which took place from 2014 till 2015 at the University of Osnabrück. Despite all these efforts, up to the day of writing this report, no solution has been achieved and the practitioners in the universities remain widely uninformed and confused. Legal experts consider it to be alarming, that four years after the decision of the high court and 15 years after the commencement of the act a solution of the conflict is not in sight (Beurskens, 2017).

This case is symptomatic for the current situation in the field of educational copyright. The main victims of this systemic failure are students, teachers and librarians, who risk unpredictable legal consequences by using digital resources for their teaching.

This effect is reinforced by the fact that, in contrast to common law countries, German copyright has no fair use clause. Using copyrighted material is only possible within the tight scope of the limitations constituted in Chapter 6 of the German Copyright Act without being balanced by a general clause, although this has been demanded by scientists and librarians for a long time (de la Durantaye, 2014).

A general clause would shift the decision-making power (up to a certain degree) to the courts, which arguably could speed up the overall process. Without a general clause, all new and outdated rules must be adjusted by the legislator. This makes the system extremely inflexible, especially when considering copyright is expected to govern a highly dynamic environment.

The consequences for OER adoption

This confusing situation can be considered one of the main drivers of OER in Germany. The more the law fails to provide practical solutions, which make use of the potentials of the new technologies, the more OER appears to be a feasible alternative.

Another speciality of the German copyright system is that rights owners and their lawyers sent cease-and-desist letters on a massive scale, claiming significant lawyer fees and damages. Just recently several cases have been documented in which originators tried to place fee-based legal warnings. In one case, a photographer whose works were popular in Wikipedia, threatened to sue '*segu Geschichte*', an OER initiative for history teachers provided by the University of Cologne, because several pictures that were perfectly attributed within the text unintentionally reappeared in the media-attachment page of Wordpress, where they were not attributed.[10]

[10] http://historischdenken.hypotheses.org/3677

The general situation concerning seemingly abusive cease-and-desist letters related to CC licensed material has not been subject of many court decisions so far.[11] But the resulting uncertainties, which might occur, if these cases receive wider recognition, carry the potential to slow down the adoption of OER in Germany and therefore should be treated carefully.

4.4.2 Data privacy law

Another field of law with relevance for OER and Open Education is the privacy legislation, which is mostly governed by the European law and can be considered to be one of the strictest in the world. The core principle is that collection of individual-related (i.e. personal) data is only allowed, if necessary for explicitly stipulated use cases.

Therefore, precautionary data collection and retention (i.e. data collected just in case it might proof useful in the future) is not permitted. Data can only be collected for a clearly specified purpose and with the consent of the data subject, or if another legal basis permits the collection. Compliance to this regulation is supported by data protection officers, which need to be appointed in every larger company or institution, especially in the public service.

Considering that monitoring learning activity can provide deep insights into the character and capabilities of the learner, this is especially relevant for applications in the field of learning analytics, but also for libraries and search engines. With the entering into force of the new European General Data Protection Regulation (GDPR) in May 2018, a high emphasis is given to the principle of privacy-by-design, and research in this field might prove of high value to tackle the problem.

The Snowden revelations caused a major outcry within the data privacy community, which has been mainly unanswered by politics so far. However, despite political paralysis, the law exposes a high threshold for data to be located on servers outside the European Union. Therefore, currently, it is hard to imagine, that Google or Amazon could provide Learning Management Systems or educational search engines for German schools and universities in the way they have in other countries.

4.5 Important reports leading to more engagement for OER in the educational field

In hindsight, it is possible to make out three reporting steps concerning OER in the German education system, which have together led to the current engagement of both educational actors and policy-making bodies in OER.

4.5.1 2014–2015: White Papers on OER

In 2014 and 2015, three White Papers on OER (Blees, Deimann, Seipel, Hirschmann, & Muuß-Merholz, 2015; Deimann, Neumann, & Muuß-Merholz, 2015; Muuß-Merholz & Schaumburg, 2014)[12] were published to provide a guide on what OER are and where they could be relevant in the context of the German education system. Each report concluded by highlighting the developments expected to particularly influence the introduction and use of OER. The following list

[11] Some references, partly in English can be found at http://ifross.org/v-urteile

[12] The one for the school sector had been published in 2012, but was updated in 2014.

summarises these influential aspects, which were broadly mentioned by all reports and can therefore be considered relevant for all educational sectors in Germany:

- Developments in German copyright — the need for better understanding of the Creative Commons licences or alternatives. However, without a further development of the German copyright law, the authors suggest OER could become more attractive, because they overcome the standard usage limitations.
- Behaviour of the publishers — since commercial publishers are the standard source of many learning materials, if these develop more digital materials and are more lenient on the use of their digital materials in classrooms, this may reduce the pressure for alternative solutions like OER. More strictly pursuing licencing infringements, on the other hand, increase the attractiveness of OER.
- The supply and costs of learning materials — the authors predict that cost concerns may not be important for OER implementation in Germany. However, they call for more actors to get involved in the supply of OER. For the vocational and further education sectors, businesses, which are involved in training, could become more engaged in producing learning materials.
- Pedagogic debates — debates focussed on learning-centred teaching and self-directed learning can be positive for the development of OER.
- Further digitalisation of hardware and learning materials — both an appropriate infrastructure and source material for OER are necessary to support further implementation and use of OER.
- Quality assurance and discovery — it must be easy for teachers and instructors to find good quality OER. Strict quality assurance regulations, however, can limit the use of OER, if all variations of a learning material have to be approved before use. The authors seem some cause for hope that flexibility will be increased (for example, since some school districts no longer require schools to only use approved materials).
- Funding of model projects — such initiatives could strengthen OER initiatives in all areas and such funding can be a clear government commitment to OER. This is also the case because the free licencing of teaching and learning materials leads to a challenge for existing business models. There must be a space to develop new concepts for the sustainable development of OER materials.

4.5.2 2015–2016: State of the art analyses

State of the Art Analysis on OER in German education (Ebner et al., 2015)

This report had the goal of mapping the situation regarding OER in each of the four key educational sectors: schooling, vocational education, higher education and further education. After reviewing the state of the art in each of these sectors, the authors come to the following general conclusions for Germany:

- Best practice examples exist even without public funding, although a lack of public funding may be holding the developments back
- A commonly shared motive for OER is that the knowledge society requires open access to knowledge and free sharing of this knowledge
- OER are seen as motor for more open learning scenarios
- OER is seen as a solution to licensing problems in the use of learning materials from third parties
- There remains a concern of how to assure the quality of OER materials.

The report does not close with specific recommendations for policy or practice.

Feasibility study on development and operation of OER infrastructures (Deutscher Bildungsserver, 2016)

This report looks at the technical side of OER sharing and co-creation. It recognises the difficulties and inefficiencies in developing new central infrastructures, but instead formulates specific recommendations for connecting existing structures and the development of common metadata standards.

4.5.3 2016: Practical framework for OER in Germany

This report focussing on the how-to question was the result of workshops with OER-experts and interested persons from the educational sectors (Wikimedia Deutschland e. V., 2016). The project had the goal of sketching a practical framework for progress in the creation and implementation of OER. It was funded by the Federal Government and carried out by Wikimedia Germany. Apart from very practical suggestions for initiatives, it also identified four areas where OER would require further support:

- Setting funding programmes and new financial incentives — to encourage the development and use of OER
- Providing professional qualifications and counselling on the use of OER — to encourage actors to take initiatives and to recognise expertise in the OER development field in a formal manner
- Tools and discovery for OER — to help users to find, use and particularly adapt materials to their specific needs. These tools should increase the user-friendliness of services and reduce the entry barriers to OER use.
- Networking and collaboration — in recognition also of the process, which led to the report, the authors suggest that further networking can support peer learning between users and support collaboration both in the creation of excellent learning resources and didactical environments for their application.

All three of these major reporting steps led to the launching of a major programme by the Federal Ministry of Education and Research for the funding of initiatives promoting the use of OER in different educational settings.

5 Quantitative overview

5.1 Collecting data with the OER World Map

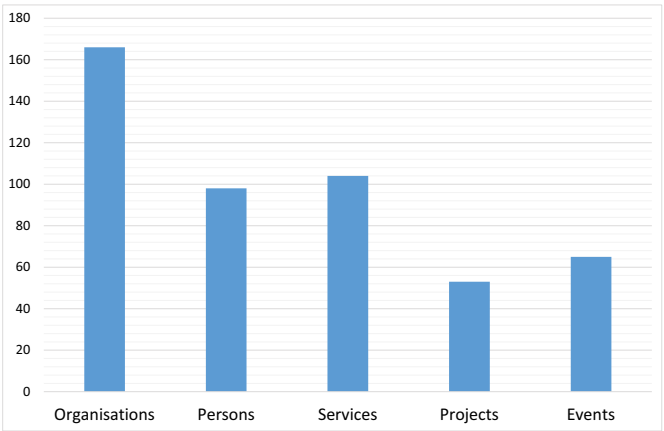
The OER World Map project collects and visualises the data on actors and activities related to OER. It has been funded by The William and Flora Hewlett Foundation since 2014 and is developed by the North Rhine-Westphalian Library Service Centre (hbz) in cooperation with graphthinking GmbH and the Open University UK.

It allows both the compilation of data manually following a Wiki logic and automatic data imports. It is located at the interface of top-down and bottom-up and is open for entries from the community as well as from government. It is also focussed on both user groups.

Recently, within the OERinfo programme (see Section 6.6), a country map has been implemented in the OERinfo Website and a national editing office was established. The system is open to be adapted by other countries.

At the time of writing this report the World Map includes 491 entries related to Germany. The main data types are organisations and persons (actors) as well as services, projects and events (activities). As can be seen in Figure 5, the data type with the most entries is 'organisation', which results from every activity being driven by one or several organisations. But according to the authors' experience, the activity-related data is often more meaningful.

Figure 5.1 OER World Map entries by data type



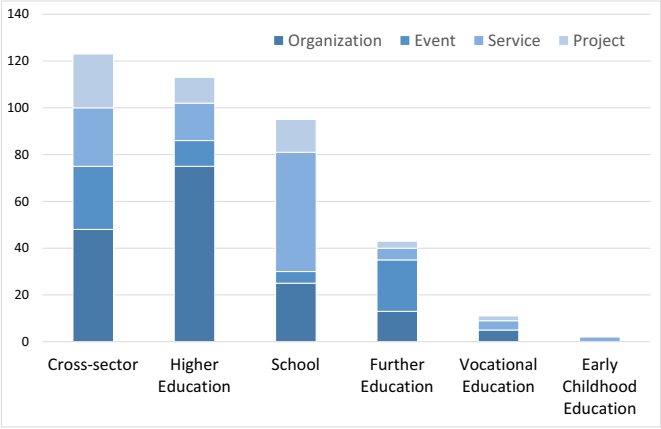
Source: OER World Map (https://goo.gl/SDpJ6Y)

5.2 OER activity by educational sector

One of the most important lessons learned from the OER World Map project so far is that data categorisation is difficult, since the needed categories are often still missing. One illustrative example is the distinction into educational sectors. UNESCO's International Standard Classification of Education (ISCED), which is used intensively on services, seemed to be inappropriate for all types of data, amongst other because it is too complex for a system, which aims at community participation. The OER World Map team therefore developed a model for the project, which distinguishes five main sectors as shown in Figure 5.2.

In general, distinguishing between sectors was demanding. For example, almost all activities of the OERinfo funding programme aims at training trainers and therefore could be qualified as belonging to the vocational sector. While this would have been a feasible solution, the team decided to focus on the core learning groups ultimately affected by a certain activity. For example, there are projects, which focus on training school teachers being categorised as belonging to the school sector.

Figure 5.2 Entries per sector distinguished by data type



Source: OER World Map (https://goo.gl/tTcV5M)

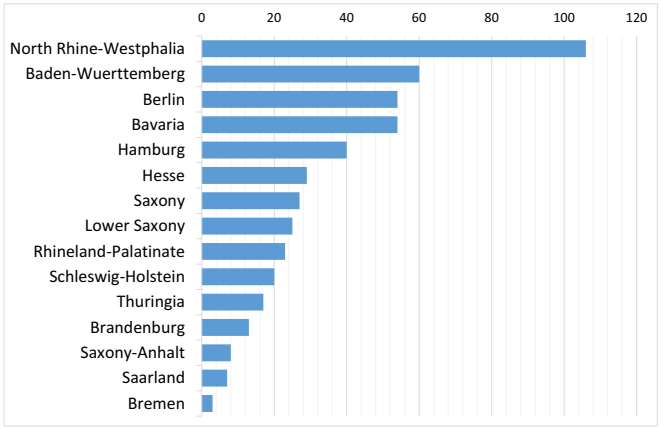
As can be seen from Figure 5.2, the biggest single group of entries have been classified as cross-sector. This includes, on the one hand, real sector independent activity (e.g. legal consulting) and, on the other, activity, which focuses equally at two or more sectors (e.g. the OER World Map). Very common are the examples, which target either equally the school and the higher education sector or equally the vocational and further education sector.

Apart from cross-sector activity, the higher education sector appears to be the biggest sector. Looking deeper, it can be noticed that around two-thirds of the entries in the higher education sector are organisations while the number of services is significantly lower (16%). One explanation for this could be that the higher education sector exports its expertise into other educational sectors, e.g. by providing services for the school sector or leading projects within the OERinfo funding line.

While by absolute numbers the school sector appears to be smaller than the higher education sector, the number of activities, especially of services and projects is significantly higher in the school sector: while only 16 services target the higher education sector, there are roughly three times more (51) services addressing the school sector. This aspect emphasises the previous statement, that the school sector is not only the oldest, but also the strongest OER sector in Germany up to date.

By a clear distance, the further education sector as well as the vocational sector are much less active at the present. While the further education sector appears to be nearly four times stronger than the vocational sector, this number is due to the high number of events in the further education sector, so that the actual activity-gap between the two sectors can be assumed to be much smaller.

Figure 5.3 Entries by state



Source: OER World Map (https://goo.gl/SMgA7a)

Finally, it is remarkable, that there are activities within the sector of early childhood education. While the movement there is still in its infancy, it can be stated that OER as a movement has reached all educational sectors in Germany by 2017.

5.3 OER activities by German state

Figure 5.3 shows the distribution of the OER activity across the German states. It is not very surprising that the *Länder* with the biggest population (North Rhine-Westphalia, Baden-Wuerttemberg and Bavaria) can be found amongst the top five. More

remarkably the city states Berlin and Hamburg belong to this group as well. Their high scores are indicators of the early adopter role both states took up — Berlin in the school sector (see Section 6.2.3) and Hamburg in the higher education sector (see Section 6.3.1).

5.4 A focus on OER services

One of the most important data types within the OER World Map is services. Services are characterised as providing some kind of value for their users on a continuous basis.

When the concept was first introduced, the primary focus was on repositories and other content sources. However, several other, less obvious types of services also exist and it is challenging to come up with a clear distinction of service types. Therefore, the following classification should be seen as work in progress, which requires further discussion and refinement. Also, it should be taken into account that many services fall into several of the categories, although they are divided by main category in Figure 5.4.

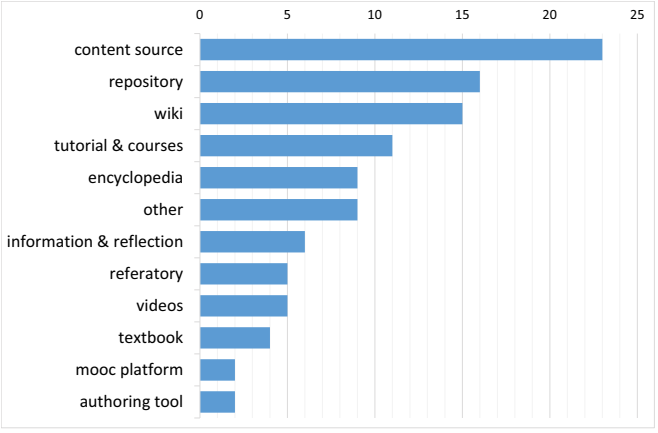
The largest group is made up of services, which provide content. Repositories are distinguished from other content sources. Quality criteria, which are known from Open Access and other academic repositories like sophisticated discovery options, standardised metadata and open interfaces/API,s are still hard to find in the German OER landscape since many of the early services have been developed without support from librarians and other repository experts.

The distinction between repositories (platforms, which host documents) and referatories (platforms, which link to documents hosted on other sides) has been taken from the feasibility study on infrastructure for OER, which is described more in detail below (see Section 4.5.2). However, while the feasibility study mainly thinks of search engines, most existing referatories in Germany are technically less demanding link-collections.

'Tutorials & courses' are platforms, which focus more on providing a direct learning experience instead of solely resources. Within the wider development from content to context, this category is expected to increase in the future.

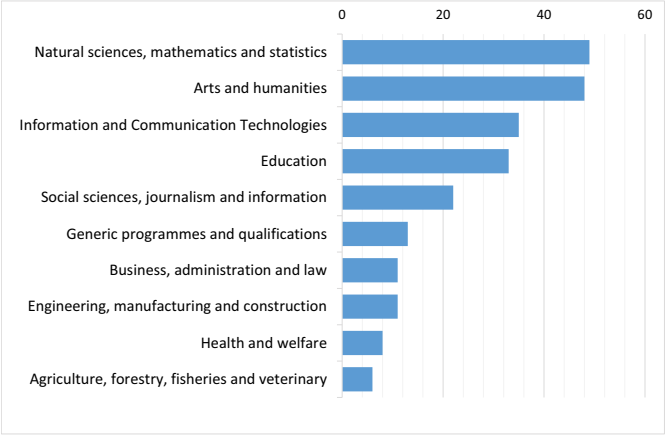
Figure 5.5 shows the subjects covered by German OER services. The topics are classified using ISCED-F 2013 classification, shown for major subject areas.

Figure 5.4 Services according to service type



Source: OER World Map (https://goo.gl/8EBpYE)

Figure 5.5 Number of services according to included subjects



Source: OER World Map (https:// https://goo.gl/ikLwUr)

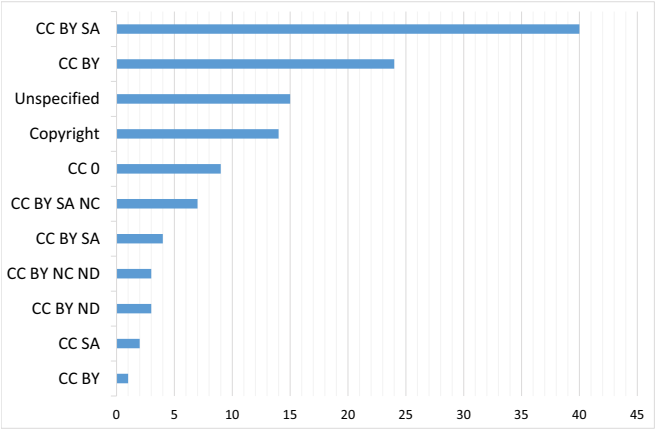
Natural sciences and statistics are strongly represented, not unexpectedly, since these disciplines are known from Open Access publishing for making intense use of digital technologies and open approaches. More surprisingly is that arts and humanities follow closely on second place. One reason for this might be that, triggered by the refugee crisis, several services aim at language acquisition and training. Also, there are several services from the fields of history, religion and music, some of them being well-established.

The relatively high number of services, which provide material from the field of education, can be traced back to several services, which support information and reflection by providing OER on OER. Rather low scores are achieved by the fields of business, administration and law as well as engineering, manufacturing and construction. Considering the high practical relevance of these subjects, the aimed production of material in this field should be of high priority in the future.

As can be seen from Figure 5.6, it is quite common for German OER services to publish their resources under licenses, which have been approved by Creative Commons for free cultural works. The most frequently used licence in Germany is the CC BY-SA license, followed by CC BY. An encouraging development is that close to 10% of the services offer resources under CC 0, which, from a user perspective, represents the optimum for easy reuse. It can be hoped that this trend will continue in the future, so that even more material can be found in the public domain.

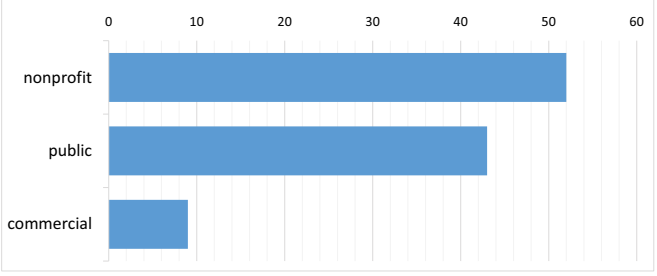
Information on both topics and licenses is currently still collected in a rather cost-intensive manual way. Therefore, one important issue for the future development of the OER World Map platform is to import this data automatically via the increasingly available API's of OER repositories.

Figure 5.6 Number of services according to used licenses



Source: OER World Map (https://goo.gl/GsDqN6)

Figure 5.7 Services according to their business model



Source: OER World Map (https://goo.gl/ruPimv)

While OER are free for the user, it has been well understood that their development requires resources. Figure 5.7 provides an insight into how the German OER movement has been funded so far. The distinction is rather rough and is heavily based on the constitution of the provider of the service. For example, services, which are provided by a public university, are classified as publicly financed services.

According to Figure 5.7, out of 104 services in total, 52 belong to the non-profit sector, which indicates a heavy contribution by volunteers as well as in some cases the acquisition of external funds. The non-profit model is especially strongly represented in the school sector.

On the other hand, 43 services are based on public funding, which does not include any funding from the OERinfo line. Only nine services follow commercial interests. Several of these receive public funding and are not expected to have reached the profit zone yet.

6 Top-down policy-led activities related to OER

In reviewing the OER-related activities in the German education system, the authors of this report distinguish between top-down and bottom-up initiatives. This approach is taken to provide an insight into where initiatives, measures and activities emerged. As the OECD study on OER (Orr, Rimini, & van Damme, 2015, p. 37) states:

"The level at which policy initiatives can and should be implemented will differ between countries and education sectors, depending on the division of regulative and operational responsibilities in an education system. Public policy formation will be shaped by considerations on what should and can be done on national, state, city and/or institutional levels, and how this presents new opportunities or challenges in connection with the respective higher or lower administrative levels of responsibility."

Previous chapters have already shown that:

- The German education system is decentralised with a complex division of responsibilities making centralised national policy in education rather seldom (Chapter 3)
- OER initiatives emerged from advocating practitioners before and parallel to policy initiatives from central or local government (Chapter 4).

However, top-down policy-led initiatives have occurred in relation to OER and these will be covered in this chapter. The following chapter (Chapter 7) will turn its focus to bottom-up community-led initiatives.

6.1 Key insights

OER-related interventions from policy-makers have taken place at both the *Länder* and the federal level.

- **School sector**: Most German schools are hardly (at most partly) digitised yet, meaning that neither the didactical nor the administrative processes at schools and central institutions are strongly supported by digital tools. As a result, the use of ICT in schools is still limited, and still the most common way to use digital resources is to print them out and spread them to the students. Nevertheless, there has been some governmental activity, which is worth noting. Most of it relates to the development of a wider infrastructure of educational platforms called *'Bildungsserver'*, which could be transformed into a network of connected repositories in the future. One critical issue is the provision of a general repository, which will allow teachers as well as the interested public to upload self-developed OER — a function currently missing in the German OER landscape.
- **Higher education**: While attention given to OER raised within the school sector from 2012 onwards, the higher education sector remained more reserved. Early examples of higher education OER activity either focussed on introducing OER in the school sector or were carried out by visionary champions, who, despite outstanding personal achievements, largely stayed isolated in their institutions. More focus was given to MOOCs, which became an intensively discussed topic from 2013 onwards. While in other countries like the Netherlands and the UK the uptake of OER was accelerated by the Open Universities, its German counterpart, the 'FernUniversität in Hagen' was not an advocate. So for several years the 'OpenLearnWare' Repository of the Technical University

of Darmstadt (see Section 7.2.3) was a lonely example of institutional support for OER. Things changed in 2015 when Hamburg announced its start of the Hamburg Open Online University (see section 6.3.1), which - at the moment - is the most ambitious and best funded OER project in Germany. In spring 2016, shortly after the call for the OERinfo funding programme, the German Rectors Conference published a statement, which supported the uptake of OER in German Universities (Section 4.3.4). Today it can be said that OER has reached the higher education sector. Of 21 disseminator projects within the OERinfo funding line, 14 are led by higher education institutions (Section 6.6.2).

- **Vocational and further education**: With the exception of the Federal Agency for Civic Education (*Bundeszentrale für politische Bildung*, bpb), which provides OER since 2013, the authors are not aware of any top-down initiated activity in the field of vocational- and further education outside the OERinfo funding programme.
- **Cross-sectional dedicated funding programme**: The OERinfo funding programme is the most significant German government action in the field of OER so far. It focuses adequately on multiple educational sectors, continuing the former emphasis on the school sector, preparing a breakthrough of OER in the higher education sector and opening the door for OER in the field of vocational and adult education. At the same time, the programme provides the German federal and state governments with the opportunity to gather more experience in the topic area, so that future decisions can be prepared.

6.2 School sector

6.2.1 The educational media platforms of the *Länder*

As has been outlined above (see section 3.2) each of the states provides a platform for teaching and learning media. These *Bildungsserver* are part of the state administration and have been characterised as top-down for this report.

The *Bildungsserver* are usually run by or on behalf of the Ministry responsible for education, often in cooperation with subordinate institutes for teacher training. It is this combination of IT infrastructure and teacher training, which makes them natural players for the mainstreaming of OER. Despite existing differences, there is broad support for OER by the *Bildungsserver*, which they expressed in a common agreement in April 2016 (Landesbildungsserver & Deutscher Bildungsserver, 2016).

The actual activity of the *Bildungsserver* in favour of OER concentrate on:

1. Production of OER
2. Curation of OER
3. Distribution of OER

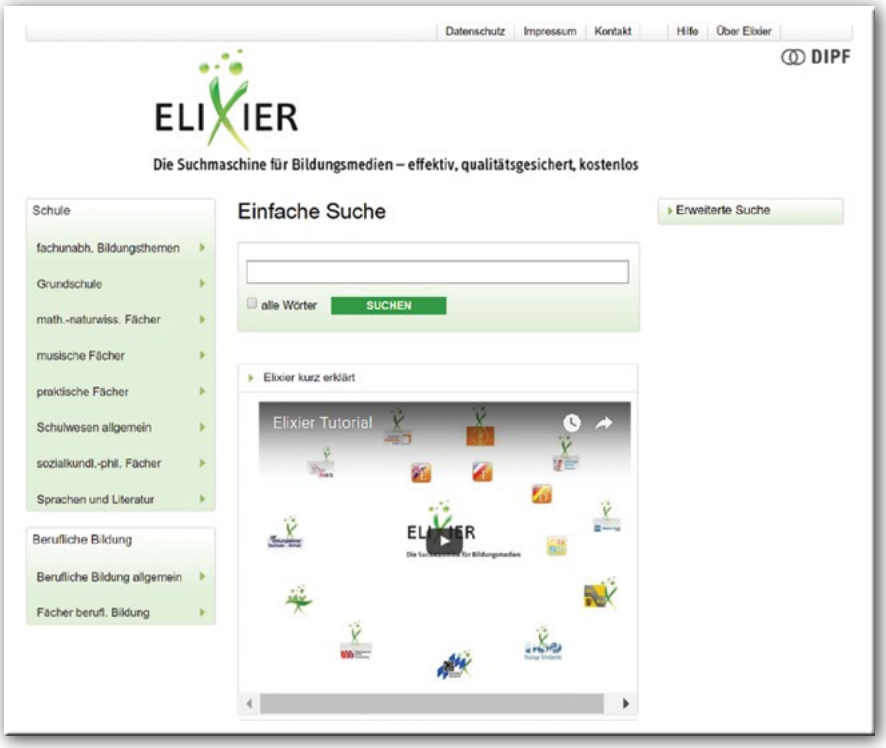
Most of the *Bildungsserver* employ small editorial teams, which curate and sometimes even publish OER, though this activity seems to be rather selective than comprehensive. Nevertheless commitment to OER is rising. For example, the platform in Baden Württemberg recently enacted a policy to license all published materials by CC BY-SA.[13]

The *Bildungsserver* also play an important role in the distribution of OER. Most of the *Bildungsserver* provide databases with learning resources, which are partly open licensed. While some of these databases provide public access, others are restricted to teachers from the referring state, possibly due to the fear of free-riders from other *Länder*.

[13] See http://www.schule-bw.de/ueber-uns/impressum-und-kontakt/oer

An open approach has been taken by the educational search engine ELixier. It includes more than 50,000 quality curated educational resources. In addition to the contents from the *Bildungsserver* of the *Länder*, contents from other services like 'Lehrer-Online', the 'Media Portal of the Siemens Foundation' or 'Serlo' (see Section 7.2.2) are indexed. Elixier has a strong focus on OER. From the currently included 9,000 resources using a CC licence, around 7,000 can be classified as real OER.

Figure 6.1 Screenshot of the educational search engine Elixier



Source: http://www.bildungsserver.de/elixier/

Elixier is based on the popular Open Source search engine Lucene and uses a LOM-based metadata scheme. One major achievement within the Elixier project was the development of a common metadata scheme, which allows importing data from the *Landesbildungsserver* into Elixier.

All in all, the *Bildungsserver* can be seen as a first step into the development of a broader OER-infrastructure. Some of the platforms lack features like modern search interfaces and open API's and arguably are not up to par with modern repository standards as known from the higher education sector. On the other side, one huge obstacle — the agreement of a joint metadata standard — has already been overcome. Anyhow the greatest achievement so far could be rather organisational than technical: the cooperation, which has developed on the operational level within the last years, is not self-evident and could turn out to be a critical factor of success in the future.

But despite all achievements one issue of highest priority remains open: the existing *Bildungsserver* do not allow teachers or other users to upload and share their material. Since there is no other general repository, which allows doing this, the German OER infrastructure is still missing a substantial part.

6.2.2 The emerging connected repositories

Connected repositories have been a frequently discussed issue in Germany. Simplified, the idea is to provide every school and every teacher with access to a repository or some other kind of cloud storage, so OER (as well as conventional resources) can be exchanged easily between teachers, schools and even states. The vision is that every teacher should be able to find, use, adopt and share OER, all within her or his familiar digital environment, whose quality and security can be guaranteed by the state.

According to the authors' observations, the idea of connecting repositories plays a more important role as it does in many other countries, because the federal structure of Germany usually requires decentralised solutions instead of a central national platform like Jorum (United Kingdom), Klascement (Belgium), Wikiwijs (Netherlands) or NDLA (Norway). Nevertheless, in theory there are two approaches to tackle the challenge: decentralised and centralised.

The decentralised approach aligns well with the distributed infrastructure of the *Bildungsserver* described above and could easily be seen as its next evolutionary step. In this model, each of the *Länder* would provide a central repository. These repositories would be horizontally connected to the central repositories of the other *Länder* as well as vertically connected, e.g. to the Learning Management Systems of the related schools beneath and a unifying index similar to Elixier.

On the other hand, a centralised approach could aim at reducing complexity by providing a single infrastructure for all states. A noteworthy initiative, which could be interpreted as taking a more centralised approach,[14] is the 'school cloud project', which is driven by the Hasso Plattner Institut of the University of Potsdam, in cooperation with the MINT-EC network.[15] It is funded by the Federal Ministry of Education (BMBF) and was officially announced by Prof. Dr. Johanna Wanka, Federal Minister for Education, during the IT Summit 2016 in Saarbrücken.

It is possible that both approaches will compete for funding in the future. In both cases, funding could come from *Länder* or from the central government, since the Federal Government is allowed to invest in cooperative funding of infrastructure, but not to influence educational teaching and learning (see Chapter 3). However, negotiations will be necessary and there will be no progress until after the national elections in autumn 2017.

The situation illustrates the often difficult relationship between states and Federal Government, which fluctuates between cooperation and competition. Regarding the discussed example above, it is hard to imagine that a central approach could be successful in the long run, since it would interfere the competences of the *Länder* and the structures, which have developed there within the last years. An interesting scenario could be the combination of both initiatives, which could result in adding a strong technology partner to the experienced and proven *Bildungsserver* infrastructure.

It would be a misconception to believe that the complex challenges related to sharing and reusing OER on an institutional level could be solved by the use of a centralised platform in the school sector. As can be learned from the feasibility study on the development and operation of OER infrastructures (Deutscher Bildungsserver, 2016), the ultimate vision for an OER infrastructure should be an ecosystem, which joins OER services from all educational sectors — see Figure 6.2.

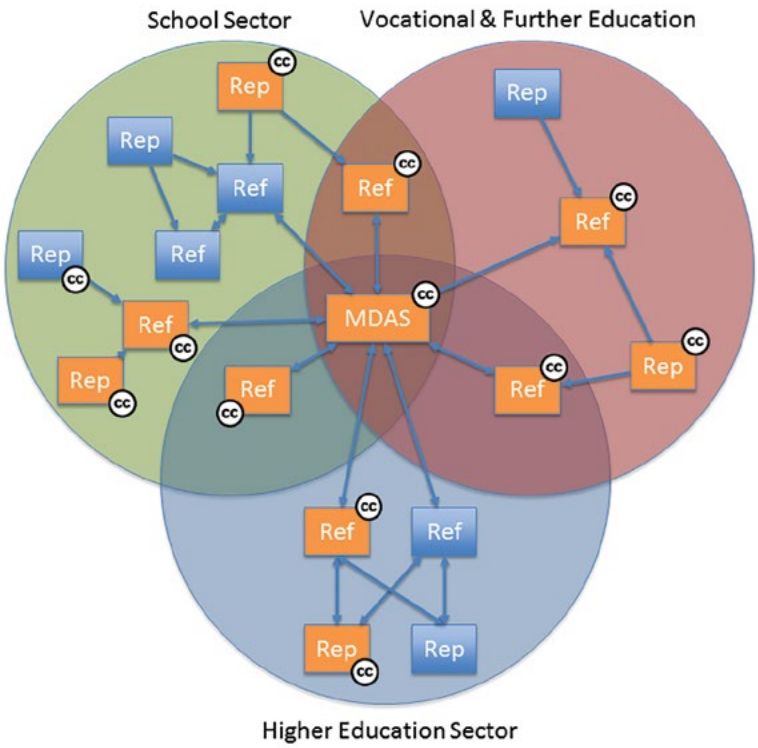
[14] The scope and focus of the project are apparently not fixed yet. Currently available information make it unclear whether this initiative will, in fact, take a highly centralised approach. A recent publication by the project seems to focus more on decentralised aspects than earlier presentations (Meinel, Renz, Grella, Karn, & Hagedorn, 2017).

[15] See https://www.mint-ec.de/

According to the study, such an ecosystem would be part of a wider technological infrastructure, which supports open as well as non-open materials. Building blocks of this wider infrastructure would be repositories (where resources can be stored) and referatories (where metadata about the resources are aggregated and indexed). Additionally, the study recommends the development of a Metadata Exchange Service (MDAS), which:

1. Receives metadata from the referatories
2. Complements the data and maps it to one or several suitable standards
3. Makes this enriched data available to the repositories and referatories by means of open interfaces.

Figure 6.2 Representation of a connected OER infrastructure with a 'metadata exchange service' in its centre



Note: (green=school, blue=higher education, red=vocational & further education)

Source: (Deutscher Bildungsserver, 2016)

6.2.3 Open Educational Resources for Berlin

Berlin is not only the capital of Germany, it is also, like the cities of Hamburg and Bremen, one of the 16 German states. As such, it is responsible for providing its 3.5 Million inhabitants with schools and other educational infrastructure. After OER became a frequent topic of educational policy discussions, it was a burning question for some time, which of the *Länder* would adopt OER first. In 2014, it turned out that Berlin was willing to become a pioneer by implementing the first major OER project, driven by a German state government.

In May 2014 the 'Technologiestiftung Berlin', a foundation, which supports research and education related to innovative STEM topics, published a study on Berlin's potential for OER (Dobusch, Heimstädt, & Hill, 2014), which includes the analysis of existing conditions in Berlin and described several scenarios with pretty concrete options for action.

One month later the Institute for Schools and Media Berlin Brandenburg ('LISUM', which also runs the '*Bildungsserver Berlin-Brandenburg*') officially announced the launch of the project 'Open learning materials for Berlin' (*Offene Bildungsmaterialien für Berlin*). The project aimed at providing Berlin-based schools with quality controlled OER, stored in a central repository. In order to ensure stakeholder participation, several round-table discussions were organised and five pilot schools were chosen to act as early adopters.

By the end of 2016 a test environment had been installed. The project itself was ended and the remaining working packages were transferred into a newly instituted OER-department in Berlin administration, which is quite remarkable, since it is the first of its kind in Germany. The new section is charged with taking a holistic approach towards OER, which addresses the technical, didactical, legal and social aspects of OER. Currently the new department is developing the plan for the stepwise mainstreaming of OER in Berlin. One of the first milestones is the appointment of 20 digital ambassadors, which will start producing OER together with teachers from Berlin at the beginning of the school year 2017/2018. LISUM also participates in the OERinfo funding line (see Section 6.6).

6.3 Higher education sector

6.3.1 Hamburg Open Online University (HOOU)

The Hamburg Open Online University (HOOU) is currently Germany's most ambitious and best funded project in the field of OER. The pre-project, which ran from spring 2015 until the end of 2016 was funded by the city of Hamburg (which is one of the *Länder*) with 3.7 million Euro. The current first phase of the project, which started at the beginning of 2017, will be funded with an additional 8 million Euro until the end of 2018.

The HOOU project follows an innovative design, which focusses strongly on openness and cooperation. The project is driven by the six public higher education institutions located in Hamburg including a medical university, a technical university, as well as universities for music and theatre as well as fine arts. The cooperation is supported by the 'Multimedia Kontor Hamburg', a cooperation owned by Hamburg's public universities which is specialised in the innovation of education, research and administration by the means of information technology.

Another special feature of the project, which underlines its transformative claim, is that it extends the classical target audience of higher education and is basically open to everyone. Within the HOOU interdisciplinary teams of learners from different institutions are expected to cooperate with interested citizens on current issues with societal relevance.

The branding core of the project is made of:

1. Learner orientation and collaboration
2. Scientific approach
3. Openness for new target groups and civil society relevance
4. Openness and OER

The project follows an agile approach and concentrates on the parallel development of two activity fields, media-didactical innovation and platform development, which are hoped to evolve in a co-evolutionary way.

Another characteristic of the project is that it explicitly aims at developing open licensed content. This includes the realisation of 60 early-bird projects, including such courses as 'Adventure Forensic Medicine', 'Innovative Moviemaking' and 'Sustainable Futures'. A detailed description of the early initiatives, amongst them many projects with local reference, has been published (Mayrberger, 2017).

But what looks spectacular on paper still needs to prove its practical applicability. In particular, the project has to face the major challenge that it was top-down initiated by Hamburg's mayor Olaf Scholz. While it is quite unlikely that a project like the HOOU could have been initiated without major policy commitment and visionary courage, its top-down design might turn out to be a barrier at the same time. In the case of the HOOU, one of its major strengths — its inter-institutional design — might turn out to be an additional burden to the development of a culture of trust and cooperation.

6.3.2 Central OER-Repository Baden-Württemberg

Another major OER project was announced recently in Baden-Wuerttemberg. At the University of Tuebingen a central repository is being developed, which will be open for 48 public higher education institutions in the state. However, when compared to HOOU, the project appears rather conservative, since it disregards didactical innovation and concentrates on library infrastructure. The roots of the project go back as far as 2002, when the University of Tübingen participated in the European Ariadne project.

The project is funded by the government of Baden-Wuerttemberg with 250,000 Euro. At its core will be an Alfresco-based repository, which will provide interfaces to the institutional Learning Management Systems as well as to a long-term preservation system. Each participating university will be able to implement an instance of its own, allowing institutional individuality, while keeping operational costs low. In view of the general OERinfo programme, the timing of the project seems to be ideal to benefit from OER developments. A first pilot of the system is planned to be available by the end of this year.

6.3.3 Digitale Hochschule NRW

It is likely that other states will follow Hamburg and Baden Wuerttemberg and start initiatives focussing on OER and Open Education in the higher education sector; although it might appear that these activities will be more hidden and less obviously addressing OER. In North Rhine-Westphalia, for example, a major initiative called 'Digital University NRW' (*Digitale Hochschule* NRW) has started 2016.[16] It aims at bundling the resources of the participating HEI in order to address a broad range of challenges related to the digitalisation of education, research and management cooperatively. OER and other open approaches make up only a small part of this initiative. Entering larger processes like this can be seen as one necessary step towards the mainstreaming of OER. It provides a new environment with new challenges for OER supporters, who have to compete for attention and resources with multiple, often more established fields of activities.

[16] https://www.dh-nrw.de/

6.4 Vocational training

Apart from the several projects in the course of the OERinfo funding programme (see Section 6.6) the authors are not aware of any governmental activity related to vocational training.

6.5 Further education: The Federal Agency for Civic Education

The further education sector in Germany is coined by a heterogeneity of providers of non-formal education. Government activity is rather seldom in this sector. One exception is the Federal Agency for Civic Education (*Bundeszentrale für politische Bildung*, bpb), which provides citizenship education and information on political issues for all people in Germany.

The bpb is one of the earliest examples of OER-related government activity. While most of its existing content does not use an open license, the bpb is increasingly promoting OER, and is publishing numerous new educational resources under Creative Commons licenses.

The bpb is an interesting example of the compatibility of public service publishing activity and open licensing. Being a public institution, which explicitly aims to spread its materials as far as possible, it has the full freedom to decide its licencing policy. Unlike commercial publishers, the bpb does not have to consider arguments on selling or not selling. So using open licencing can lower barriers to the distribution of its content without correlating drawbacks.

6.6 Cross-sectional OERinfo funding programme

6.6.1 Introduction

The OERinfo funding programme was prepared by a number of consultations, studies and recommendations, which took place between 2012 and 2016 (see Section 4.5). It is the most significant German government action in the field of OER so far. It aims at

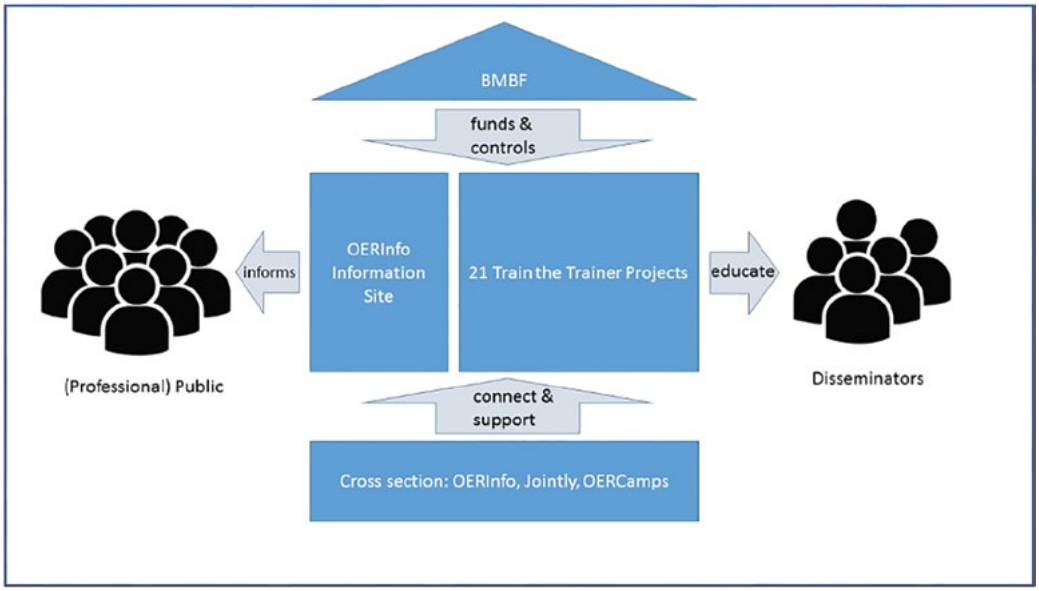
> "a broad demonstration of the potentials inherent to OER and the development of the skills needed for the use, development and distribution of open learning resources. To this aim, it supports the broad anchoring of OER in Germany, which so far has been blocked by missing abilities of the users and inadequate knowledge of the concept of OER on the part of the respective user group."[17]

The funding line is designed with two pillars at its core:

- The development of a central information website, which provides high quality information about OER to the interested (professional) public
- The development of the required skills to use, develop and distribute OER in the course of 21 train-the-trainer-projects.

[17] https://www.bmbf.de/foerderungen/bekanntmachung-1132.html

Figure 6.3 Architecture of the OERinfo funding programme



The programme is funded and controlled by the Federal Ministry of Education and Research. Three cross-sector projects aim at connecting, coordinating and supporting the activities of the overall programme. The complete programme will be funded with 6.6 Mio Euro (Surmann, 2017). The development of the OERinfo website is funded for 24 months with 1.2 Mio Euro. The other projects are usually funded for 18 months, with sums ranging from 95,000 Euro to 460,000 Euro.

6.6.2 Train-the-trainer projects

The first pillar of the programme is made up of 21 projects in different educational sectors, which all share a common train-the-trainer logic. The main idea is to educate disseminators, e.g. from the field of teacher training or central media and support units. These disseminators will then pass on their newly required skills to teachers and trainers in a second step, which itself is not part of the programme.

It can be said that with the OERinfo funding line OER has reached the higher education sector in Germany: 14 of the 21 train-the-trainer projects are directed by higher education institutions. Additionally, higher education institutions are project partners in several of the remaining seven projects.

The fact that a project is run by a HEI does not necessarily mean that it addresses the higher education sector as well. The projects of the programme aim at all educational sectors. While four projects target exclusively the school sector, six aim at the higher education sector and three at the sectors of adult education and vocational training. Eight projects aim at several educational sectors.

In several cases, HEIs lead projects, which focus on other sectors. Nine of the projects aim, primarily or amongst other things, at expanding existing teacher education programmes, many of them being driven by universities.

The projects also differ very much in their scope. While two projects aim at the introduction of OER at a university, eight aim to anchor OER in multiple relevant institutions within a state. Of the latter, Bavaria, Berlin/Brandenburg and Niedersachsen focus at the school sector, while Saxony focusses on the higher education sector. Hamburg addresses both the school and the higher education sector. Finally, North Rhine-Westphalia and Rhineland Palatine have the

broadest focus, addressing disseminators from institutions in the school, the higher education, the vocational and the further education sector.

The outcomes of the projects usually include some sort of face-to-face training as well as the production of learning resources. Common formats are workshops, informational events and consultancy. One project offers weekly open workshops, which allow OER novices to stop by and get in touch with experienced practitioners in an informal atmosphere. At the University of Cologne physical 'OERlabs' will be installed, which will support collaborative consulting and learning processes by bringing together different stakeholder groups of the university.

As far as the produced learning resources are concerned, a huge variety of formats can be identified, which include complete e-learning courses, educational videos, the generation of a CC-0 licensed book as well as the adaptation of an established university journal.

Several projects aim at secondary goals, which exceed the training focus by addressing other challenges related to the mainstreaming of OER. Connecting experts with experts, experts with novices, as well as novices with novices is important to achieve sustainable progress. Therefore, nearly half of the projects explicitly aim at community development in one or the other form.

Four projects aim at providing some sort of strategy development to prepare policy- and strategy-making. Finally, three of the train-the-trainer projects also aim to develop OER-related software, like LMS plugins or at developing standards, e.g. related to metadata.

6.6.3 The OERinfo website

The second major outcome of the programme will be the installation of a central information website, which provides high quality information on OER. The 'Information point OER' (*Informationsstelle OER* — OERinfo[18]) is developed by a multi-institutional team lead by the German Institute for International Educational Research (DIPF).

A core editorial team is provided by the Jöran & Konsorten agency, which ran a similar service in the past named 'Transferstelle für OER'. Jöran & Konsorten contribute blog posts, podcasts, video-interviews and other current status information on the state of OER in Germany and worldwide. DIPF provides the project management, additional editorial support as well as the technical implementation and hosting.

The connection to the established educational sectors is guaranteed by four so-called transfer partners, who are established educational players in different educational sectors: The FWU-Institute for the school sector, the Learning Lab of the University Duisburg Essen for the higher education sector, the Federal Institute for Vocational Education and Training (BIBB) for the TVET-sector and the German Institute for Adult Education (DIE) for the adult learning, further education and training sector. Acting bi-directionally, the transfer partners use their established networks to disseminate information from OERinfo into their respective educational sectors and collect information relevant to OERinfo within their sectors.

Additionally, the OER World Map project driven by the North Rhine Westphalian Library Service Centre (hbz) provides data and information on OER actors and activities with a special focus on Germany. To do so, an 'OER Germany Map' will be implemented in the OERinfo site, which will support connectivity within the programme and contribute to its transparent documentation.

[18] 'OERinfo' is used as an abbreviation for both the programme and its major project.

6.6.4 Cross-section projects

The activity within the programme is connected and supported by three cross-section projects. The OERinfo-project aims both at providing information on OER to the wider public, but also at supporting the 21 train-the-trainer projects by organising central events, announcing events and publishing the results of the projects.

Another cross-section project is 'Jointly', which is developed by a heterogeneous group including the 'edu-sharing Network e.V.' (see Section 7.2.1) and the University of Applied Sciences Lübeck (see Section 7.2.3) under the lead of the 'iRights e.V.' (see Section 7.2.1)[19]. Jointly directly supports the OERinfo programme by providing a repository, which can be used for collecting documents created during the programme.[20] The project also aims at connecting technicians in order to support the development of concepts for a wider OER infrastructure in Germany.

Finally, there are four 'OERcamps' in 2017, one for every compass direction in Germany. The camps are organised by Jöran & Konsorten. The standard format is that one half of the two-day-programme is organised as a barcamp unconference, the other half as workshops set up in advance. Extrapolating from the first three OERcamps in 2017 (the fourth will take place in Berlin in November 2017) there will be around 750 registrations, 150 workshops and 130 barcamp sessions on OER within the OERcamps in 2017.

6.6.5 Interim review of OERinfo

The authors of the report do not intend to provide a complete evaluation of the OERinfo programme, but aim to provide a short interim review here, as it is such a central element of OER developments in Germany. In order to support the overall success of the programme, the following list contains six insights, which could be used to stimulate the ongoing reflexion process.

1. While most important stakeholder groups are addressed by the OERinfo programme, libraries are not. This is regrettable, since libraries have turned out to be one of the strongest supporters of OER in other countries.
2. One of the advantages from Germany's late entry into the field of OER is the possibility to learn from other countries like the United States, the United Kingdom or the Netherlands. The increased German participation in recent international conferences indicates the interest to foreign OER activity. Policy-level support for the systematic analysis of existing experience in the field of training and education abroad could be considered and might help to support efficient learning.
3. There is hardly any reuse of existing material from other countries.
4. Like many other OER initiatives, there seems to be a strong focus on teachers, while students and other learners are largely neglected.
5. There is no scientific evaluation or monitoring of the overall programme progress.
6. While the potential of OER has been widely acknowledged, political commitment is still unclear, which results in a limited planning perspective. Currently, there is no decision to continue funding after 2018. It would be desirable, if a possible subsequent funding programme became more comprehensive addressing both infrastructure development and content production.

[19] iRights e.V. is closely related to iRights law — one of Germany's leading law offices in the field of open approaches

[20] https://oer-contentbuffet.info/edu-sharing/ng2/components/oer

7 Bottom-up activities related to OER

7.1 Key insights

- When compared to other countries Germany has scored low on top-down and high on bottom-up activities in the past. This is a consequence of German politics having largely ignored the topic of OER until recently, although this has been changing (see Chapter 4 and 6).
- Since OER activities are mostly driven bottom-up, there has been a need for sharing questions, experiences and materials between players, who have been isolated in their own institutions. These players found opportunities for sharing in cross-sector events and within relevant communities. Especially the barcamp/unconference format turned out to fit well the goal of developing a strong German OER community. Indeed, Germany so far has seen a remarkably strong cross-sector community with common interest in OER.
- In Germany, there are many cross-sector activities that address OER on a general level. However, both the school sector and (latterly) the higher education sector are active. There is comparatively less engagement in OER initiatives in the further education and non-formal education sectors.
- The project *kindOERgarten.de* was started in February 2017 as the first initiative for OER for Early Childhood Education.
- While there are bottom-up platforms for special subjects (RPI, Serlo) there is currently no generally accepted central platform, which allows teachers to upload self-created material, while (central) OER repositories have to be treated with care, in the current situation basic functionality is missing, which is expected to slow down the reception of OER.

7.2 Presentation of activities by educational sector

This chapter takes a standardised approach to presenting each of the cases. For every educational sector, several prominent featured activities are highlighted and some additional activities listed.

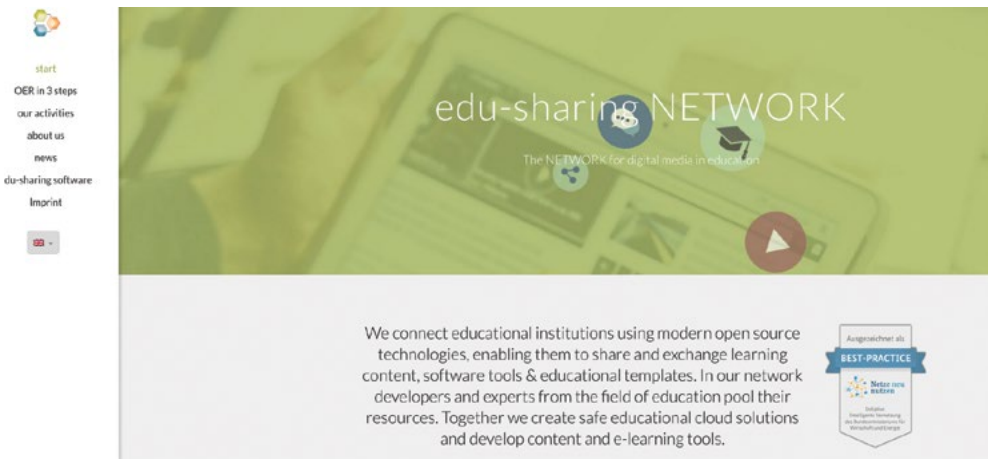
While the featured activities are regarded as particularly interesting, some have been chosen as representatives for a certain type of activity. Within each section, the activities are sorted in alphabetical order. The link provided for each project leads to English-language information, where available.

7.2.1 General cross-sector activities

Featured activities

Logo and/or Screenshot	
Name	**Alliance for Free Education (*Bündnis freie Bildung*)**
Description	The alliance for free education is an association of organisations that are willing to promote the idea of open educational resources in society and politics. Therefore only the materials that comply with the definition of OER are determined free and open.
Relevance	The alliance is a forum for those interested in OER policy making. It provides networking opportunities and gives voice to the idea of open education in the general public and the political arena.
Provider	Alliance of organisations and individuals with no formal organisational structures. Currently Wikimedia provides staff for coordination.
Founded	Founded in 2014 by Creative Commons Germany, Wikimedia Germany and Open Knowledge Foundation Germany
Tags	advocacy; OER policy making; alliance
Web	http://buendnis-freie-bildung.de/
OER World Map	https://oerworldmap.org/resource/urn:uuid:ee73232f-855f-4784-bf40-bf5d01a5a426

Logo and/or Screenshot	
Name	**German Institute for International Educational Research (*Deutsches Institut für internationale Bildungsforschung* — DIPF) / German Education Server (*Deutscher Bildungsserver* — DBS)**
Description	The German Education Server is the central internet guide to navigate through the German educational system. Supported by federation and federal states, the national web portal provides editorial supervised premium quality contents to all professions related to education and to the public at large. It is operated by Deutsches Institut für internationale Bildungsforschung (DIPF — German Institute for International Educational Research).
Relevance	DIPF and DBS provide services that are relevant to the "infrastructure of open" in Germany, including such projects as: • Elixier, a search engine for curated content in the field of education, containing about 10% of its content licensed under a Creative Commons license. • Edutags, a social bookmarking tool focused on educational content. It specialises in marking and filtering OER. Edutags received an OER award in March 2016. • OERinfo: The German Education Server successfully competed for funding from the BMBF to set up a central OER information service for Germany. • Feasibility study on OER in Germany, which was commissioned by the Federal Ministry of Education and Research to the German Education Server and the Learning Lab at the University of Duisburg-Essen (see Section 4.5).
Provider	DIPF is a public institution financed by both federal and state resources. It is a member of the Leibniz Association.
Founded	1951 (DIPF), 1996 (DBS)
Tags	research; information infrastructure; OERinfo; Elixier; Edutags; *Deutscher Bildungsserver*; education policy
Web	https://www.dipf.de/en/dipf-news?set_language=en / http://www.eduserver.de/
OER World Map	https://oerworldmap.org/resource/urn:uuid:f4f8af31-ac5d-497c-9c96-ec958c465b09

Logo and/or Screenshot	
Name	**Edu-sharing network e.V.**
Description	As a non-profit organisation, the edu-sharing network e.V. takes care of the availability of high quality learning content, the network organisation, quality assurance and the initial consulting for non-profit organisations. At www.edu-sharing.com you can find a separate website managed by the software developers of the open source system. There you will find information about products and services surrounding the edu-sharing open source technologies.
Relevance	Edu-sharing network e.V. both plays a role by providing technologies with a special focus on repositories and by providing networking activities for the OER community with a technical background.
Provider	The Edu-sharing network e.V. is a not-for-profit organisation funded by membership fees. Additionally, Edu-sharing.com is a for-profit technology company.
Founded	2010, as a follow-up to the research project CampusContent funded by DFG.
Tags	repository; software; networking platform; content provider; content production
Web	http://edu-sharing-network.org/?lang=en
OER World Map	https://oerworldmap.org/resource/urn:uuid:19cf20b0-91d0-4fe4-bcc4-2cd25286cc61

Logo and/or Screenshot	
Name	**iRights.info**
Description	iRights.info is an information platform on questions of copyright and other legal areas. iRights.info provides background reports, news, dossiers and other publications. Their goal is to provide a better understanding of copyright and other legal areas in the digital world.
Relevance	All content on the website is published under a CC License One of few legal services promoting CC licenses in Germany, first publisher specialising in legal issues regarding the influence of copyright and digitalisation on society. Partner to many (publicly funded) educational websites on internet safety (klicksafe) and digital education.
Provider	The iRights e.V. is a non-profit organisation, which received public funding in 2004–2008. There are connected organisations by the same name: iRights.Law as a law firm; the think tank iRights.Lab providing expert opinions, studies, research projects and consulting on strategic issues; and the publisher iRights.Media.
Founded	2005 as an online platform
Tags	legal information; background reports; dossiers; news; publications; workshops
Web	https://irights.info/was-ist-irights-info-projekt
OER World Map	https://oerworldmap.org/resource/urn:uuid:fc4e408a-e725-4588-bbc5-0404b9ca8687

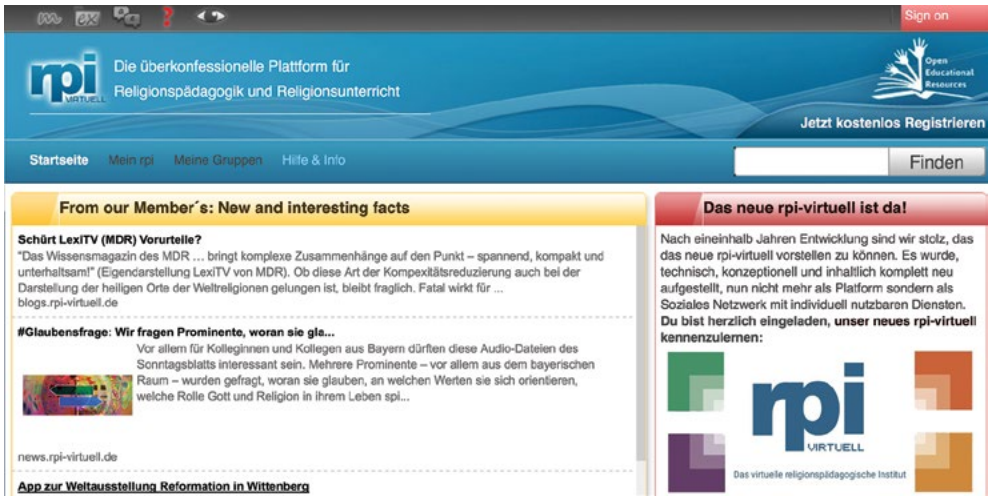
Logo and/or Screenshot	
Name	**Agency J&K — Jöran and Fellows (*Agentur J&K — Jöran und Konsorten*)**
Description	The team at J&K connect the educational and the digital world through consulting, public speaking, writing, editing, designing events and online projects. Since 2012 OER has been a focus of their work. They founded and operated the transfer hub for OER (Transferstelle für OER), which is the basis for the information hub now established as part of OERinfo (see Section 6.6). J&K are also the founders and the organisers of the OERcamps, regular unconferences on OER, the OER Awards and the OER Festival.
Relevance	The J&K OER hub served as a focus point for the emerging OER community in Germany, providing information on the subject. The OERcamps and OER Festivals also helped to connect the community and widen the playing field. The team at J&K is furthermore active in the production of OER in various sectors.
Provider	J&K — Jöran und Konsorten — is a company with eight permanent employees and a network of freelancers.
Founded	Agency founded in 2009, started working on OER in 2012, delegated the '*Transferstelle*' to the newly founded OERinfo in November 2016. J&K are still operating the blog of OERinfo, organising events and providing consulting and training on OER.
Tags	website; general; information; news; community building; training; consulting
Web	www.joeran.de/oer
OER World Map	https://oerworldmap.org/resource/urn:uuid:08b0cfbb-823d-49f6-99a3-285438828883

More activities

- **Edutags** (http://edutags.de) is a social bookmarking platform for the educational sector. Edutags offers connections and networking with OER producers.
- **Free Software Foundation Europe e.V.** (https://fsfe.org/about/about.en.html) is a non-profit organisation. Its mission is to empower users to control technology. The Foundation has played a significant role in advocating for OER in Germany.
- **German Commission for UNESCO** (http://www.unesco.de/) takes on the role of a hub and link for activities on OER in Germany with other parts of the education sector. It provides publications and patronage and is also a very active networking player.
- There are several foundations in Germany that are active in the field of OER. They provide OER material with the aim of lowering access barriers to their resources. Active in this field are, for example, the ***Bertelsmann Stiftung*** and the ***Heinrich Böll Stiftung***.
- **The North Rhine-Westphalian Library Center** (***Hochschulbibliothekszentrum des Landes Nordrhein-Westfalen* — hbz —** https://www.hbz-nrw.de/). The hbz is leading partner in the OER World Map and implements several activities promoting OER.
- Behind **O3R.EU** (http://o3r.eu) you find the "Publikationsreihe Beiträge zu offenen Bildungsressourcen" ("Publication series contributions to open educational resources"). Up to now there have been 13 publications since 2011. O3R is supported by the non-profit BIMS e.V.
- **Open Knowledge Foundation Deutschland e.V.** (https://okfn.de/en/) is a non-profit organisation that advocates open knowledge, open data, transparency, and civil participation. In recent years OER has been a growing field for Foundation activities, especially by connecting various open movements.
- **Pixabay.de** (https://pixabay.com/en/) provides more than 1 million free stock photos under the CC0 licence. The company is the best-known company for open content in Germany.

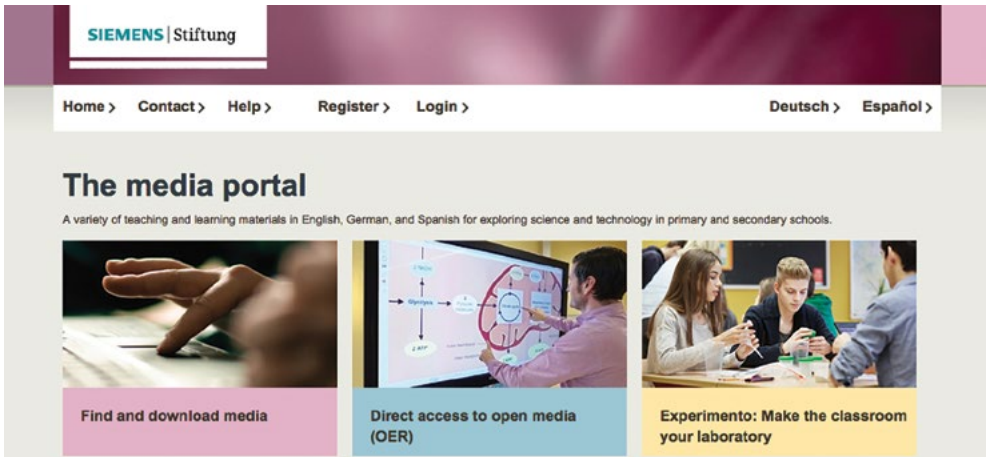
7.2.2 School

Featured activities

Logo and/or Screenshot	
Name	**rpi virtual (*rpi virtuell*)**
Description	The rpi virtual is a religious didactic internet platform hosted and funded by the Comenius Institute in Münster. rpi virtual is an OER repository and further education platform for conceptualising and creating OER materials and a collaboration tool for free licensed educational media production. The rpi virtual exploits and uses the opportunities given by the internet for religious didactic activities in schools and the community. It displays innovative stimuli and introduces the users to well-thought out materials with a proper handling of digital media. People of all confessions involved in teaching religious topics are invited to participate in the rpi virtual.
Relevance	The platform is consistently oriented on OER and might be classified as a most early example for mainstreaming OER. The members of rpi virtual were among Germany's early advocates for OER.
Provider	The rpi virtual is a part of the Protestant Centre for Research and Development of Education (Comenius Institute, Münster). It offers its services free of charge.
Founded	2002, explicitly using CC-licenses for own content since 2008.
Tags	teaching material; online course; community; webspace; religious education
Web	http://www.rpi-virtuell.net/
OER World Map	https://oerworldmap.org/resource/urn:uuid:63905512-0eb3-47cb-ab8e-b6bd83fea18e

Logo and/or Screenshot	
Name	**Serlo**
Description	Serlo is an open online learning platform. All learning resources on Serlo are free of charge and without advertisement. Like on Wikipedia, every user can create new content or improve existing materials.
Relevance	Serlo provides 840 explanatory entries, 4,600 solved exercises, 120 courses and videos for math and other school subjects. More than 700,000 school and university students use Serlo each month.[21] Serlo won several awards, among them OER Award 2016 in the category 'Biggest Impact'.
Provider	Serlo is a not-for-profit organisation, supported by a non-profit organisation with the same name based in Munich. The initiative was started by two students while they were still at school. The founders describe themselves as social entrepreneurs.
Founded	2010
Tags	general education; OER community; teaching material; authoring platform and community; learning platform; self-learning platform
Web	https://en.serlo.org/
OER World Map	https://oerworldmap.org/resource/?q=serlo#urn:uuid:6fc9d260-23bb-11e5-bba4-001999ac7927

[21] Numbers from July 2017

Logo and/or Screenshot	
Name	**Siemens Foundation Media Portal (*Siemens Stiftung Medienportal*)**
Description	The media portal supports educational professionals with a wide range of teaching and learning materials related to science and technology. The portal offers more than 5,500 media in German, English, and Spanish. The free materials are designed for use in preschools, primary and secondary schools.
Relevance	The repository was the first prominent OER project founded, financed and operated by a large foundation. It also went through the process of making existing content available as OER by newly licensing it under a Creative Commons license (CC BY SA 4.0). Siemens Stiftung also supports the OER movement by sponsoring events in Germany. It also supported the conference 'OE Global 2017' in Cape Town.
Provider	Siemens Stiftung
Founded	2009, gradual change to open licenses from 2015
Tags	repository; STEM; teaching material
Web	https://medienportal.siemens-stiftung.org/
OER World Map	https://oerworldmap.org/resource/urn:uuid:0cdf2128-360d-11e5-980a-7bb55dcbead6

Logo and/or Screenshot	
Name	**tutory.de**
Description	The tutory.de is an online editor for OER specialised in worksheets for schools and general education. Teachers and educators may create, customise and share learning and teaching materials using a drag-and-drop system of small samples of licensed content. The editor searches Wikipedia, Pixaby, Flickr and Openclipart for pictures and graphics and imports licenses automatically. It makes licensing works easy due to automatically handling licenses and setting layouts.
Relevance	The tutory.de is a rare example of a German edtech startup that is known beyond Germany. In July 2017 it had 3,500 registered users and 700 active users per month. The tutory.de is often mentioned as an example for technological solutions for making dealing with OER easier.
Provider	The tutory UG (entrepreneurial company with limited liability) is a start-up based in Leipzig and Berlin. The company was supported by a grant from the European Social Fund (ESF) until March 2017. They provide a freemium model for teachers and educators.
Founded	2016
Tags	general education; OER editor; start-up; online editor for teaching materials; authoring tool
Web	https://www.tutory.de/information-english
OER World Map	https://oerworldmap.org/resource/urn:uuid:0d027f1a-5643-4a23-b7bc-8889aac25474

Logo and/or Screenshot	
Name	***Zentrale für Unterrichtsmedien im Internet e.V.* (ZUM e.V)**
Description	ZUM.e.V. is a collaborative platform providing teaching and learning resources created by its members as well as webspace to create wikis and etherpads for educational purposes. ZUM covers a wide range of topics for all grades of primary and secondary schools. It is member-driven and most content is provided by professional teachers.
Relevance	ZUM.e.V. is probably the oldest (founded 1997) and largest grassroots educational project in Germany. It attracts a great number of users and promotes the idea of OER. The members of the ZUM community are very active in advocating activities. ZUM.e.V. might be considered as the best example of a truly grassroots and collaborative effort for OER by educators in Germany, if not worldwide.
Provider	The non-profit association *Zentrale für Unterrichtsmedien im Internet e.V.* is a community driven website financed by sponsors, while the content is provided by volunteers. It has a core team of more than 200 members.
Founded	Founded in September 1997; using CC BY-SA licensing since 2008
Tags	general education; OER community; teaching material; authoring platform; community; learning platform; wiki; etherpad
Web	https://www.zum.de/
OER World Map	https://oerworldmap.org/resource/urn:uuid:5be060b1-3276-4419-9e33-26543d91e8a0

More activities

- ***Cornelsen Verlag*** (https://www.cornelsen.de/) is one among three publishing companies that dominate 90% of the German textbook market for primary and secondary education. Cornelsen was the first one to publish two regular books for teachers with a CC BY SA licence. Both books cover the topics of digitalisation, one on coding in primary education (2016), another one more contains a collection of ideas and tips for using digital media (2017).[22]
- ***Medienanstalt Berlin Brandenburg* (mabb)** (http://www.mabb.de/) is one of 14 agencies regulating private broadcasting companies in Germany. The mabb has been promoting openly licensed educational resources in the federal states of Berlin and Brandenburg, providing teacher training and advice to school administration on the state level.

[22] It may be of interest that the OER community in Germany had mixed feelings about these activities since the second book has initially not been published in a digital format so that usage as OER was limited.

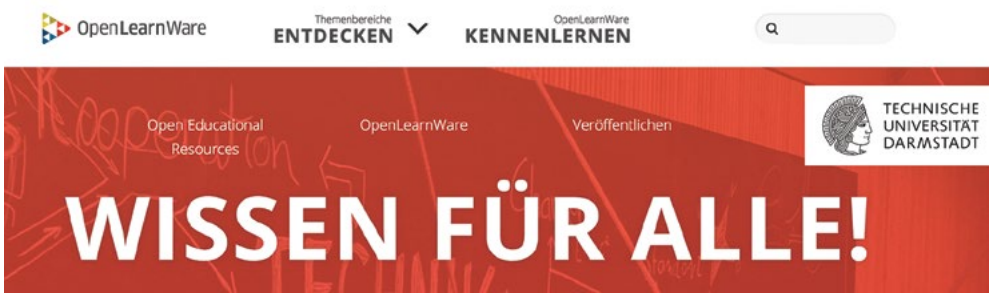
- ***Schulbuch-o-mat*** (http://www.schulbuch-o-mat.de/) is a grassroots project founded by a teacher and a media producer. It provides a platform for open textbooks, and has collaboratively created and published a biology textbook in 2013 with 10,000 Euro raised via crowdfunding.
- ***Lehrer online*** (https://www.lehrer-online.de) is a company providing educational information for teachers and materials for a wide range of subjects and school levels. The business model has a subscription for a members-only section providing access to lesson plans, worksheets and alike, among them OER.
- ***SeGu Geschichte*** (https://segu-geschichte.de/) started out as a research project at the University of Cologne in 2011. It provides a learning environment for history students and teachers. Segu Geschichte fosters self-directed learning by providing work plans for students. Teachers use the tool segu-planer to adjust lesson plans to their students' needs.

7.2.3 Higher education

Featured activities

Logo and/or Screenshot	L3T Lehrbuch für Lernen und Lehren mit Technologien
Name	***Lehrbuch für Lernen und Lehren mit Technologien*** **(L3T)**
Description	The course book for teaching and learning with technologies (short L3T) is freely available since 2011. 116 authors, 80 surveyors and others accomplished the display of a first version of the course book. The course book was revised for printing in 2013. The L3T contains 59 chapters that are accessible as Open Educational Resources, also available as print versions.
Relevance	Chapters from L3T had been downloaded more than 500,000 times by the beginning of 2016. Very striking is the unique approach via a 7-day book sprint with 250+ contributors in 2013, which demonstrated a most collaborative effort.
Provider	Technische Universität Graz and BIMS e.V.
Founded	2011 (first edition), 2013 (revision and CC BY-SA licensing)
Tags	course book; textbook; collaborative authoring
Web	http://l3t.eu/
OER World Map	https://oerworldmap.org/resource/urn:uuid:c3069db7-971f-4d4e-a557-86a0dab62a1a

Logo and/or Screenshot	
Name	***mooin, oncampus***
Description	Mooin is the most active German MOOC platform. Their course materials are usually produced as OER. Videos are also published via YouTube. Mooin has partnered with the Austrian platform iMOOX as 'MOOChub Partners' promoting the idea of openly licenced MOOCs.
Relevance	Mooin is an active MOOC producer and producer of mostly CC BY resources. The technical framework for providing OER is a Moodle fork (open source). Oncampus has been one of the organisers of OER-Festival in 2016 and 2017.
Provider	The oncampus GmbH is a subsidiary of the University of Applied Sciences Lübeck for distance learning and e-learning. Apart from various offerings, especially on tertiary education, oncampus operates the MOOC platform mooin, which mainly provides free licensed courses. Multiple OER contents are produced, for example the OER playlist on YouTube. Furthermore, oncampus is one of the organizers of the OER Festival 2016.
Founded	2003 (oncampus), Mooin and OER since 2015
Tags	distance learning; MOOC; lifelong learning; continuing education
Web	https://www.oncampus.de
OER World Map	https://oerworldmap.org/resource/urn:uuid:4acc8053-05a4-4890-9e99-81af4a831933

Logo and/or Screenshot	
Name	**OpenLearnWare (OLW)**
Description	OLW is the online platform of the Darmstadt University of Technology that provides free access and exchange of learning materials. Lecturers at the University can provide their teaching materials publicly on the OpenLearnWare platform as for lecture notes, presentation sheets, scripts or audio files. It is recommended to use a CC BY SA licence. The platform itself is also open source.
Relevance	OpenLearnWare has been active in OER since 2009. There are currently 3689 resources produced by 258 lecturers from the Darmstadt University of Technology.
Provider	Darmstadt University of Technology (Technische Universität Darmstadt), a public university with 26,360 students and 2,756 academic staff.
Founded	distribution of first OER in 2009; relaunch in 2014
Tags	repository; lectures; talks; university
Web	https://www.openlearnware.de/
OER World Map	https://oerworldmap.org/resource/urn:uuid:a8b12952-aff1-4e2b-aca6-42c8395d98fc

More activities

- **iMOOX** (http://imoox.at/) is the only MOOC-platform in Austria. Although it is based at the University of Applied Sciences in Graz (Austria) it plays a significant role for OER in Germany because courses and resources are published in German and under open licences.
- **Open eLearning Content Observatory Services** (**OLCOS** — http://www.olcos.org/) was the project co-funded in 2006-2007 under the European Union's eLearning Programme. It produced the ODEC Roadmap 2012, which explored possible pathways towards a higher level of production, sharing and usage of Open Digital Educational Content (ODEC).
- **Open Educational Ideas** (http://www.idea-space.eu/) is a platform that has been developed to find peers to connect and work together on open education from the very beginning to the final outcome — whether this is an open course or open textbook or anything else that helps to open up education.
- The **Open Educational Resource Initiative of the Faculty of Civil Engineering at RWTH Aachen University** provides a YouTube channel for OER (https://www.youtube.com/channel/UCMg7OPagfjM_eUYsDw3c4-A). The project's goal is to build up a set of standard features in Civil Engineering as Open Educational Resources to be used by any student or university.

7.2.4 Initial training and further education

Featured activities

Logo and/or Screenshot	 
Name	***Volkshochschulen / ichMOOC***
Description	Folk high schools (Volkshochschulen, VHS) are adult education centres funded on a local level and providing low- or non-credit courses. There are currently more than 900+ local VHS with 3,000+ regional offices with 9 million course participants, and 190,000 independent staff for the courses (numbers for 2015). Within the VHS community top down OER initiatives as well as a grassroots movement '*Erweiterte Lernwelten*'. The latter organises the sharing among practitioners via MOOCs and barcamps. In 2015, the VHS in Bremen and Hamburg joined forces with oncampus (see section for HE) for the MOOC 'My digital me' ('Mein digitales Ich', #ichMOOC), completely produced as OER.
Relevance	The #ichMOOC with 1,500+ participants in 2015 was awarded an OER Award 2016 for the cooperation between different fields of education.
Provider	Volkshochschulen are mostly local funded and operated institutions. They have a mixed funding. #ichMOOC was free of charge for participants. Hamburger Volkshochschule, die Bremer Volkshochschule und die Fachhochschule Lübeck, oncampus GmbH developed content and operated the course.
Founded	1844 first VHS / 2015 #ichMOOC
Tags	adult education; lifelong learning; vocational training; civic education
Web	https://www.dvv-vhs.de/en/home/ (German Adult Education Association) http://www.ichmooc.de (#ichMOOC course hosted by mooin)
OER World Map	https://oerworldmap.org/resource/urn:uuid:a526fdb4-d0e6-47d2-bf58-746c5891a97b

Logo and/or Screenshot	
Name	**wb-web**
Description	The wb-web is an online portal for educators in the field of adult and continuing education. All materials are OER. The website also offers a dossier about OER.
Relevance	All resources are openly licensed. It is the first platform focussing on adult education and promoting OER and an "open mindset".
Provider	The wb-web is provided by the German Institute for Adult Education (Deutsches Institut für Erwachsenenbildung — Leibniz-Zentrum für Lebenslanges Lernen e.V. (DIE)). The initial phase was supported by *Bertelsmann Stiftung*.
Founded	2014
Tags	post-secondary non-tertiary education; lifelong learning; adult education; community building; continuing education
Web	https://wb-web.de/
OER World Map	https://oerworldmap.org/resource/urn:uuid:0df6181e-3d83-4051-9047-5060ec09f37a

Logo and/or Screenshot	
Name	***W. Bertelsmann Verlag (wbv)***
Description	The publishing house *W. Bertelsmann Verlag* (wbv) has a special focus on vocational training, adult education, continued education, university and research, human resources and organisational management, educational research and social research. In addition to publishing books and e-books, wbv hosts an open access platform.
Relevance	The wbv has published 300+ books as open access, many of them in the field of education. Employees are active in the communities of OA and OER.
Provider	The publishing house is based in Bielefeld, Germany and acts in the fields of education, occupation, and social research. (*W. Bertelsmann Verlag* (wbv) has nothing to do with the multinational corporation Bertelsmann.)
Founded	1864, open access publisher since 2013
Tags	open access; publisher; ebook
Web	http://www.wbv-open-access.de/
OER World Map	https://oerworldmap.org/resource/urn:uuid:815e91fb-f2b9-49ff-a725-d0fbb4cd7b92

More activities

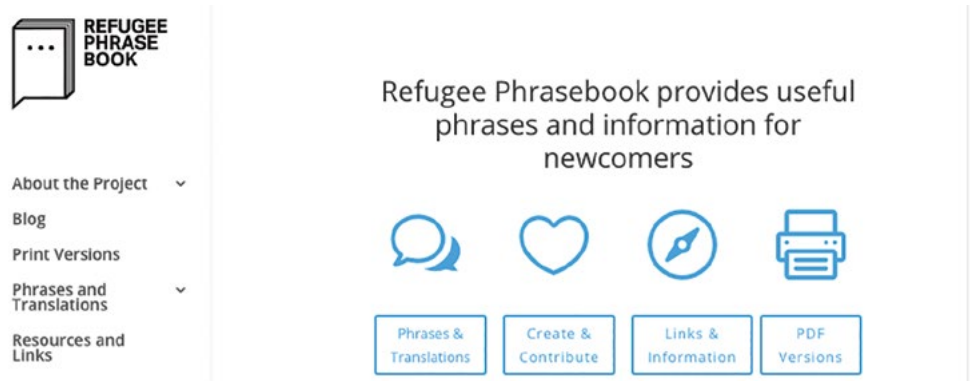
- **Cogneon Wiki** (https://wiki.cogneon.de) started out as an intranet for Cogneon GmbH, a consultant for community management. It is now open to the public, providing a knowledge base about change management, lifelong learning, and related subjects under a CC BY licence.
- **PflegeWiki** (http://www.pflegewiki.de/) is a wiki with information for health care professionals. It was launched in 2004 as a students' project and was later transferred into a non-profit association. PflegeWiki has currently 7,200+ articles under the open licence GFDL.

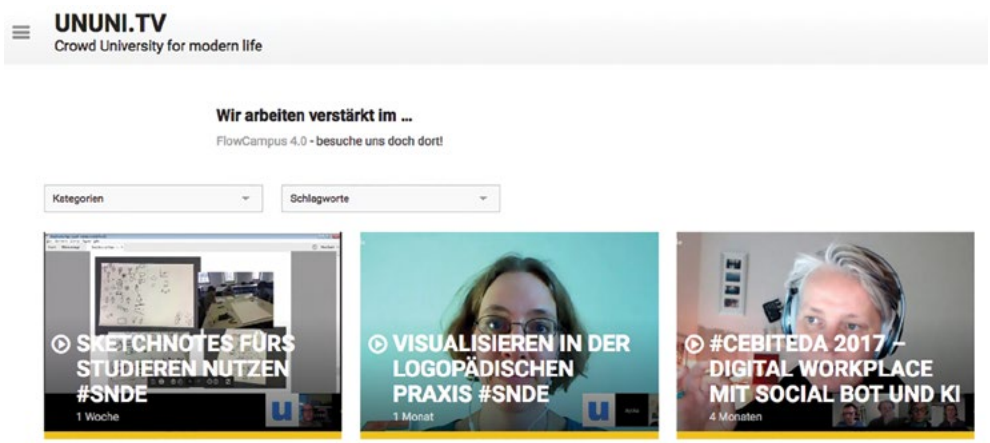
7.2.4 Non-formal education

Featured activities

Logo and/or Screenshot	
Name	***Bildung Migration Innovation Soziale Exzellenz gem. e.V.*** **(BIMS e.V.)**
Description	The BIMS e.V. is a platform for the non-profit encouragement of some researchers and practitioners ("think-and-do-tank") from the educational field. In various initiatives, BIMS e.V. asks for and develops solutions to education and educational offerings that are freely available for users. Currently a main focus is set on development, trial and research in the field of OER and open learning offerings (MOOCs). The application of technology at workplaces and for learning purposes as well as creative usage of those are in the centre of scientific attention. Political activities in different initiatives are deployed to raise the public interest for open materials and education in general.
Relevance	Members of the BIMS team were among the very first researchers in the field of OER in Germany. BIMS has completed outstanding projects like the textbook L3T, kindOERgarten.de, and OER for the maker community. BIMS also provides a series of scientific contribution on OER (o3r.eu).
Provider	BIMS e.V. is a non-profit organisation aiming at "making education reachable".
Founded	2007 (previously active as a provider for language courses for migrants since 1990)
Tags	Kindergarten; MOOCs; maker community
Web	http://www.bimsev.de/n/?BIMS_e.V._in_English
OER World Map	https://oerworldmap.org/resource/urn:uuid:c560e277-254d-4021-837c-c49a4172cc8b

Logo and/or Screenshot	
Name	**CC your EDU**
Description	CC your EDU is a website explaining the use of Creative Commons licenses in educational contexts. It provides an extensive list of links to (openly licenced) resources sorted by subjects.
Relevance	CC your EDU is the veteran site about OER and Creative Commons for teachers in Germany. For years it has been the most shared link for teachers interested in OER.
Provider	CC your EDU was set up by Damian Duchamps, a teacher volunteering his time to promoting OER. The name is a pseudonym. Duchamps rarely appears in public and refers to his website as a private project.
Founded	2011 (no updates since January 2014)
Tags	Creative Commons; linklist; referatory; OER capacity building
Web	http://www.cc-your-edu.de/
OER World Map	https://oerworldmap.org/resource/urn:uuid:ca1ac22f-3838-409b-b5d9-e1e6bcd951da

Logo and/or Screenshot	
Name	**Refugee Phrasebook**
Description	The Refugee Phrasebook aims at building an open collection of useful words and phrases for refugees who just arrived. The Refugee Phrasebook is a multilingual tool that provides basic vocabulary for the most common immediate needs. The website focuses on creating print versions from publicly available data and enable helpers to create their own version. All translations, phrases and links on this site are provided under a Creative Commons License (CC0).
Relevance	The project was a response to a specific need in the context of the European refugee crisis in 2015. It was developed by a community of volunteers and had broad impact with a six-digit number of printed copies being distributed in 44 languages for refugees and those helping them. The project was awarded an OER Award in 2016.
Provider	The Refugee Phrasebook is a community project coordinated by the Berlin-based support group. The website is hosted with the support of Open Knowledge Foundation Deutschland e.V.
Founded	2015
Tags	community project; refugees; German as a foreign language
Web	https://www.refugeephrasebook.de
OER World Map	https://oerworldmap.org/resource/urn:uuid:9b33023e-d89b-40a3-811c-43d6155c8ef7

Logo and/or Screenshot	
Name	**ununi.tv — Crowd University for Modern Life / open ed-talk**
Description	The ununi.tv provides video talks and Q&A sessions about the transformation of the society, education, and workplace. The projects provides the videos via YouTube under a CC BY licence. For two years a series of 26 episodes called OpenEd-Talk @ ununi.tv was released. The hosts Markus Deimann (then a member of *Fernuniversität Hagen*) and Anja Wagner (Head of ununi.tv.) invited guests to talk on open education.
Relevance	OpenEd-Talk @ ununi.tv usually had a broader focus than OER-related questions. Ununi.tv states in their mission statement: "We want to enable people to share their experience and to become members of a large movement of the Creative Commons. Through networking, participants collaborate towards alternative solutions."[23]
Provider	The ununi.tv is a network organisation with an open video portal for the public accompanied by a closed community area for paying members. It is coordinated by the educational consultant Dr. Anja C. Wagner.
Founded	The ununi.tv started in 2011, was crowdfunded in 2013 and is in ongoing transformation. The first open ed-talk was held in January 2014, the last one in March 2016.
Tags	open education; live video; self-learning; podcast
Web	http://ununi.tv/ and http://opened.ununi.tv/
OER World Map	https://oerworldmap.org/resource/urn:uuid:81232d43-76e2-477a-8020-fe1092c0b2c1

[23] http://ununi.tv/about

Logo and/or Screenshot	
Name	**ZUM-Willkommen (Willkommen-Wiki)**
Description	The zum-willkommen.de is an open portal that provides materials, information and ideas/concepts for German language lessons especially for refugees and asylum seekers. The main emphasis is on digital open contents for autonomous language learning. The zum-willkommen.de is designed for unsalaried (and others) German language teachers that already work or are planning to work with refugees and/or asylum seekers learning German. In addition to that zum-willkommen.de can be used by German learners to improve their language skills.
Relevance	ZUM-Willkommen is a community project by ZUM e.v. (see Section 7.2.2). It has a wiki with 99 pages and 934,170 views (by July 2017). It was initiated as a response to the exploding demand for materials for working with refugees and asylum seekers.
Provider	ZUM e.V.
Founded	2015
Founded	refugees; community project; German as a foreign language
Web	http://zum-willkommen.de
OER World Map	https://oerworldmap.org/resource/urn:uuid:f44c4b7f-05fc-42e4-82ab-0ad3b55d02f2

More activities

- **klexikon.de** (https://klexikon.zum.de/wiki/Hilfe:In_English) is a wiki and a community aiming at building a Wikipedia for children. Klexikon was established in December 2014 and currently (July 2017) contains 1,800+ articles. Articles are only published as a finalised and reviewed version. Klexikon is supported by Wikimedia Germany and ZUM e.V.
- **Math for Non-Freaks** (**Mathe für Nicht-Freaks** — https://de.wikibooks.org/wiki/Mathe_f%C3%BCr_Nicht-Freaks) is an open mathematics course book designed for university freshmen. The project is supported by Serlo and published on wikibooks with approximately 900,000 clicks a year.
- ***Methodenset Barcamp-Schulung*** (http://jbc.medialepfade.de/) is a toolbox for providing youth barcamps. It aims especially at educators and activists outside of the formal educational institutions. It was produced by several institutions with public funding from the Federal Ministry of Family Affairs, Senior Citizens, Women and Youth. It was award with the OER Award 2016 in the category "Great Wide Open".

7.3 Special focus on events

7.3.1 The community

OER in Germany in the early years was not driven by the state level nor on institutional levels. Thus the OER community grew by organising itself, connecting those who were separated across different organisations and even sectors. These individuals with very different backgrounds met and still meet at certain events and stay in contact via certain communities. The community is not a fixed group but rather a loose connection between those interested in OER. It has constantly grown and is still growing while the debate on OER is spreading on different levels. While there were probably 100 individuals interested in OER by 2012, their number in 2017 might have topped the 1,000 mark.

7.3.2 OERcamps

A milestone for the German OER community were the Educamp 2011 and the first OERcamp 2012. In the aftermath of the discussions on the *Schultrojaner* (see Section 4.4), the Educamp was the place of a first community gathering. The Educamp is a barcamp-style, community-organised unconference where practitioners from all educational sectors meet twice a year. In Bielefeld in November 2011 there was a strong emphasis on current discussions on OER (in the school sector), which resulted in the intention to start an organised community for sharing and publishing OER as an alternative model to the proprietary solutions offered by the publishing industry. The initiative was named *freiebildungsmedien.de* (free educational resources) but did not survive the initial momentum. The Educamp though was a partner in the first OERcamp, which took place in Bremen in 2012. It was organised by Agentur J&K and supported by Internet & Gesellschaft Co:llaboratory, University of Bremen, and EduCamp e.V. Around 70 educators, activists and a few publishers met for three days to work within the barcamp format.

From 2013 to 2016 the OERcamps took place once a year, organised by Agentur J&K and supported by multiple partners. In 2017 the formal ownership of the OERcamps was transferred to ZLL21 e.V., a nonprofit organization dedicated to 21st century learning. OERcamps then were designated as horizontal measures within the OERinfo funding (see Section 6.6).

7.3.3 OER Conferences

In 2013 and 2014, Wikimedia Germany hosted two conferences on OER. They combined the OERcamp and curated conference format and gathered 200+ participants each. Additionally, in 2015 there was a conference "*Perspektiven freier digitaler Bildungsmedien (OER) in Politik, Wissenschaft und Praxis*", hosted by *Deutsches Institut für Internationale Pädagogische Forschung* (DIPF) in Frankfurt.

7.3.4 OER Festival

In early 2016 several activities were combined for the first OER Festival #OERde16. There was the OERcamp plus a one-day conference including an award ceremony for an OER Award and a publication 'OER Atlas' (Neumann & Muuß-Merholz, 2016). The OER Festival was designed to be a gathering of the diverse OER community, which also reflected in the number of 41 organisations that were involved as partners and supporters. A second OER Festival with a similar structure has been announced for the end of November 2017.

7.3.5 Mainstreaming OER in events

Recently there have been educational conferences with a special focus on 'Open', including OER, for example "Campus Innovation", an annual conference on higher education in the digital age had 'Openness' as their annual theme in 2015.

7.4 Special focus on MOOCs and communities

For those active in OER in Germany there has always been a need for active networking since individuals often lacked the support of their institutions or central hubs on OER. The events described above were one way of networking. The other place was the internet. While there are more or less structured places for continuous networking, there were several MOOCs that can be described as catalysts for the OER community.

There are currently two MOOC platforms with German-language courses, Mooin (Germany) and iMOOX (Austria) that understand MOOCs as OER with open licenses (see Section 7.2.3). By providing MOOCs on a broad range of topics they have spread the idea of OER to several fields in the sense of OER mainstreaming.

Both platforms also provide MOOCs on OER. A prominent role was played by the online course COER13 in 2013, which provided information on OER, but used a connectivist MOOC approach, paving the way for a strong network of activists and educators (https://de.wikiversity.org/wiki/COER13). COER13 is also an outstanding example for OER in Germany: the course material was reused for follow-up courses in different settings and by different providers. It is today the one and only larger-scale practice of reusing and revising contents from earlier MOOCs for new MOOCs in Germany.

Besides MOOCs there are active communities on Twitter and Facebook. While on Twitter the Hashtag #OERde is well established, there is even more debate in a Facebook group (https://facebook.com/groups/oerde), which currently has 1,230 members, among them 891 active in the last 60 days and on average one new posting, three new comments and eight reactions a day.

8 Evaluation and lessons learnt in Germany

This report has shown Germany to have a multitude of OER-related activities across the education system, many both long-term and new champions of using OER in the field and, since late 2016, the emergence of the first reports on the digital agenda for education, which foresee a clear role for OER. On all levels, the disheartening conclusion of a Germany report published in 2016 can be overturned: "The results have shown that in Germany there are no OER policies, no funding for OER, and limited awareness about OER." (Miao, Mishra, & McGreal, 2016) This positive impression is confirmed by the OER World Map, which contains nearly five hundred entries for Germany and more than 160 active organisations. However, more can be done and is expected.

This final chapter will reflect on the current state of play in Germany by posing three questions:

- What has been the character of Germany's engagement with OER until now?
- How comprehensive has the strategy of mainstreaming OER been in Germany?
- What next steps might be expected in the near future?

8.1 Manner of engagement

The character of a country's engagement with OER is likely to be related to at least three aspects, which can also be formulated as questions: How is the education system organised and is responsibility for any sort of change divided across the system? What is the common way of doing things? What are the current educational problems and how is OER expected to contribute to their solution?

Chapter 3 showed the decentral organisation of education in Germany, where responsibility is divided up between the federal and state (*Länder*) level differently for schooling and higher education than for vocational and further education. This makes it hard to formulate and implement fully national policies, because they must be agreed between the federal and state levels. Chapter 4 shows that this is expected currently for implementing the digital agenda for education in Germany, but is currently on hold due to the upcoming national elections. Therefore, it is common in the educational field to have some initiatives, which are truly national, whilst for others there may be state-level champions forging ahead, whilst others are laggards or choose to set their priorities elsewhere.

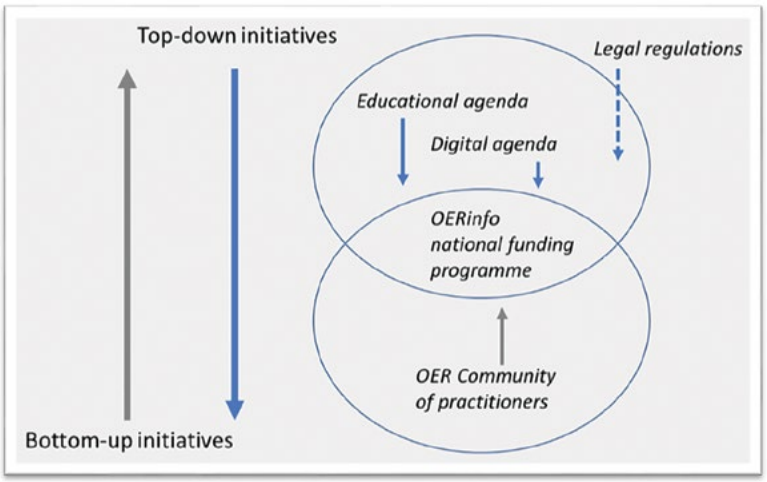
Both the OER World Map statistics in Chapter 5 and the description of top-down and bottom-up initiatives in Chapters 6 and 7 highlight Berlin and Hamburg to have been early adopters — Berlin in the school sector and Hamburg in the higher education sector. But the OER World Map entries also show that there are activities in all German states. In this context, it is interesting to note Germany's recent engagement with the so-called digital agenda and the reform challenges it raises for all parts of society in most states and at federal level. If OER is clearly seen as part of this agenda it may lead to a more even spread of engagement in OER in the coming years.

However, despite the clear challenges for the current educational system being highlighted in independent reviews (see Section 4.2), many of the official strategic documents from policy-makers have had a very limited view of what

OER can be used for (see Section 4.3). The key educational challenges are predominantly the increasingly diverse paths through the educational system, which present challenges for teaching and learning (e.g. requirement of special support for certain groups). Still, until now the role has been largely foreseen for making educational media more accessible (overcoming some of the copyright restraints) and perhaps more adaptable.

Whilst debates have been on-going on policy level, the grassroots movement in Germany has been very strong. Viewing this from a policy perspective, the authors of this report have termed this bottom-up activity. The many champions of OER across Germany have formed a strong community of practice and exchange. There has been a need for sharing questions, experiences and materials between players, who have been isolated in their own institutions. These players found opportunities for sharing in cross-sector events and communities. Again, this is now reflected in the OER World Map entries, with the highest number of entries for cross-sector activities.

Figure 8.1: Overview of the main components relevant to OER development in Germany



This makes the federal level funding programme, launched in late 2016 and entitled OERinfo seem most appropriate to the field. In summary, it can be said that the OERinfo programme made a reasonable and well-designed entry into the topic of OER. It addresses awareness-raising and know-how development, which are two of the most urgent challenges of mainstreaming OER. It focuses adequately on multiple educational sectors, continuing the former emphasis on the school sector, whilst preparing a breakthrough of OER into the higher education sector and opening the door for OER in the field of vocational and adult education. The funded projects are well connected and there is a strong will to cooperate on shared challenges, which is now being realised at multiple community events. At the same time, the programme provides the German federal and state governments with the opportunity to gather more experience on the topic, so that future decisions can be prepared.

It is interesting to note that the OERinfo funding line works well, no matter what future political decisions related to OER might look like. If there is a decision to step deeper into OER by funding infrastructure or content development, OERinfo is a perfect starter for the wider programme. If, on the other hand, no major investment in OER follows, OERinfo still makes sense, since the increasing awareness arguably will increase the number of people using existing OER platforms and tools.

8.2 Comprehensiveness of the strategy

As already mentioned, it is not easy to talk of strategy in the German context, because — even if the focus is solely on the central authorities for educational strategy — there are sixteen state ministries and one federal ministry all responsible for certain aspects of the educational sector. However, it remains interesting to review the main strands of activities. The argument for OER presented in the OECD's recent study of the innovative potential of OER called attention to the importance of mainstreaming (Orr et al., 2015). This argument is also being put by at the second World Congress on OER, which is taking place in September 2017 in Ljubljana, whose slogan is: from commitment to action.[24] The OECD study recommends four core areas for policy interventions to support this action, especially if it is to go beyond a core group of champions and enter the mainstream, where it can have a much larger effect (Orr et al., 2015, p. 37;127).

- ***Establish repositories and support the provision of open licence materials***

The provision and discoverability of OER has been a topic at least since the review of practices and recommendations for connected infrastructures and a preference for referatories in 2015 (see Section 4.5.2). The cooperation between the educational platforms and their agreed position that any resources they produce should be OER by default is a positive development here (see Section 6.2.1). But despite all achievements one issue remains open: the existing *Bildungsserver* do not allow teachers or other users to upload and share their material. Since there is no other general repository, which allows users to do this, the German OER infrastructure is still missing a substantial part of the necessary infrastructure.

Other initiatives such as the HOOU in Hamburg, which again take OER as standard, are welcome. A hindrance to what seems like a simple decision to make open licencing of educational materials standard are the legal debates, which ensue in the educational sector, particularly in higher education (see Section 4.4).

- ***Establish new communities of practice within the teaching body to encourage OER production and use***

The OECD recommends here awareness-raising, setting up a national competency centre, supporting the expansion of communities of practice through cascading techniques (train-the-trainer) and making OER a standard element in teaching training. The OERinfo funding programme seems to have followed this recommendation very closely, since it contains all of these elements in a nicely designed funding programme, which starts out from existing and aims to expand and deepen communities of practice (see Section 6.6).

- ***Change the framework conditions of formal education settings by modifying rules, promoting new tools and re-assigning the division of labour***

This recommendation for policy action came from a recognition that teachers and educators work in a set environment (or field of activity) and that the norms and expectations of this field also effect the value given to certain activities and tensions, which might occur if someone is doing something differently (Orr et al., 2015, p. 100 ff). This is where top-down initiatives can aid and nurture bottom-up ones (Cerna, 2013; Figgis et al., 2007). For this reason, the recommendations suggest providing space for experimentation with using, developing and adopting new content. The focus in recent educational reports and the digital agenda for education on competency-based learning instead of fact-based learning (see Section 4.3) could be facilitative for this, but these ideas only exist as policy papers at the moment.

[24] http://www.oercongress.org/

- ***Promote the provision of more research on how OER are produced and used in certain contexts and by certain actors in education systems (teachers, learners and prosumers)***

This recommendation is common in the field of OER, since OER is often associated with a potential for innovation, but this potential is less often proven. One reason for this is that OER are associated with wide-ranging potentials and indeed these might be different from country to country (Miao et al., 2016). It is, however, of note that the current leading top-down initiative in OER support, the OERinfo programme, does not even foresee the monitoring of results from the 24 subprojects it funds. This is a mistake, which leaves a gap in the positive view of this programme. The UK's OER programme did foresee a parallel reporting and monitoring of the funded programmes and this led to some insightful reports on communities of practice and dissemination of innovative practices (Littlejohn, Falconer, Mcgill, & Beetham, 2014). The further development of the OER World Map's data on Germany may help to cover at least the quantitative side of the evolution of practice, but as the OECD study suggests, qualitative research is equally vital (Orr et al., 2015, p. 89 ff).

8.3 Next steps

Despite of all the activity mentioned in this report, OER has not reached the educational mainstream in Germany yet. But it seems to be moving in the right direction.

The expected next steps can only be listed as possible future developments. How the adoption of OER in Germany will develop depends on several influencing factors, which are — whilst awaiting national elections in September 2017 — hard to calculate. In order to provide orientation, the authors have sketched three scenarios, which illustrate the conceivable courses of development. While the adoption actually depends on multiple causes, the authors assume that the completion or non-completion of the 'Digital Pact' (see Section 4.3.3) will be of decisive importance.

Scenario One: Intensive adoption

Starting point for this scenario is that the *Länder* and the Federal Government agree on the so-called 'Digital Pact' after the federal election in September 2017. As a result, the Federal Ministry for Education and Research puts up several billion Euro for the digitalisation of the educational system. Based on intensive discussions within the last years it is likely that part of this funding will be provided for OER. Even if only a small percentage of the funding is used for Open Education, it seems realistic that open approaches will be funded with several tens of millions of Euro.

It is likely that a large proportion of this money is used for infrastructure expansion like the development of repositories and search engines. Since there has been a focus on quality in the OER discussion from the beginning, it can also be expected that quality assurance will be addressed as well, even if it is still unclear, how this will look in detail. Finally, the authors anticipate that emphasis will be given to the measures, which support innovating educational processes with a special focus on collaboration between educators and adaptivity of materials.

Within the school sector, OER will also benefit indirectly from investments in hardware like new computers and wireless networks. It is quite possible that the existing *Bildungsserver* will be developed into a network of connected repositories, as has been described above (see Section 6.2.1), potentially with the participation of one or several strong technology partners. The Federal Ministry of Education and Research has already initiated a project called '*Schul-Cloud*' (school cloud), connected to the idea of the Digital Pact. If this school cloud is to be the central infrastructure for resources for all schools in Germany then its features regarding OER will be a crucial factor.

The authors expect that a big proportion of the subsidies will be acquired by HEIs, which will take a leading role in the development of innovative products and services in all educational sectors. Additionally, there will be a number of projects that focus on the implementation of Open Educational Practices in the higher education sector.

It is likely that special regard will also be given to the sectors of vocational- and further education. Ideally, truly innovative platforms aimed at fostering lifelong learning could develop here. One plausible scenario could be a cooperation of adult education centres with public libraries, which together could provide technology-based learning solutions for everyone.

Interestingly, the authors are not sure that, even within the intensive adoption scenario, there will be major investments in the systematic development of high quality content collections. Unlike in the United States, OER is seen less as a means of reducing costs of educational media and more as a catalyst for change. While only few of the studies mentioned in this report (see Section 4.5) suggest the systematic production of content, the authors would recommend evaluating possibilities of systematic content development carefully in order not to miss the full exploitation of the potentials related to OER.

Scenario Two: Medium uptake

Within the second scenario, the development speed of the last years can be extrapolated, so that a medium uptake of OER in Germany can be expected in the future. Cause for the non-appearance of a significant increase of the development speed as described in Scenario One could be: i) that the Digital Pact will not occur or ii) that the Digital Pact occurs, but will not take into account Open approaches or c) that the Digital Pact fosters OER as described in Scenario One, while at the same time inhibitory factors (see Scenario Three) remain strong.

In that case, the authors would expect the uptake of OER in the school sector, especially, to continue. Assuming that the bottom-up activity described in this report (see Chapter 7) continues as before, overall activity could be stimulated by the increasing awareness level of OER as a result of the OERinfo funding programme. From 2018 on, a growing number of disseminators will be trained in OER by the OERinfo programme. Especially if OERinfo is successful in anchoring OER in several public teacher training programs, it can be expected that the number of teachers, who are skilled in OER and related open practices will constantly grow each year.

As one critical condition for the mainstreaming of OER, the necessary infrastructure should be available. As one example of missing infrastructure, it has been pointed out in this study that currently no general repository for OER exists, which can be used for uploading and sharing material on a large scale. Nevertheless, the authors would consider that this shortcoming could be overcome, even without substantial funding through the Digital Pact, since this report already includes several examples of the development of OER repositories, which could close this gap in the near future.

Extended uptake in higher education will be much harder without continued funding and will depend on the occurrence of additional driving forces, which could be the success of lighthouse projects like the HOOU in Hamburg (see Section 6.3.1), the breakthrough of Open Research and Open Innovation or growing legal problems, which will make compliant handling of conventionally licensed digital resources impractical.

Also in the field of vocational and further training, the authors consider significant progress in this scenario as rather unlikely without external driving forces, which eventually could appear in the form of the refugee crisis, which is increasingly addressed by services that provide material for German as a foreign language.

Scenario Three: Stagnation or decline

While Scenarios One and Two anticipate growth in various degrees, Scenario Three addresses a situation of stagnation or even decline. Prerequisites for this scenario are as follows: i) the Digital Pact does not occur and ii) that additional weakening or blocking factors appear. One possible weakening factor could be a wave of multiple successful legal cease-and-desist letters, which could reinforce existing uncertainties on the part of the teachers concerning copyright and fair use, so that OERinfo will be weakened and mainstreaming of OER significantly slowed down.

Conclusion

At the time of writing this report (July and August 2017) it is hard to predict the future uptake of OER in Germany. The authors tend to expect either a strong or medium uptake of OER, nevertheless stagnation cannot be excluded with certainty. While Germany was a late starter in the field of OER, it has significantly caught up in the last five years.

The authors expect that more reliable forecasts can only be made after the outcomes of the national elections in Germany (September 2017) and the formation of the next Federal Government (following in the months after September). This situation might be interpreted as a phase of "just wait and see", but it could also be seen as a highly crucial time for lobbying for the cause of OER to exert influence on crucial decisions.

8.4 Lessons learnt

This review of OER-related activities in Germany, finally, provides at least four key insights for other countries and developing a supportive framework for OER implementation in the mainstream:

- A potential for supporting OER is emerging within the general educational debates on how to assure effective digital educational strategies and practices. OER are well-placed within this framework, but it is important to review whether their full potential is reflected in key strategic documents.
- In many countries, there is a significant number of OER practitioners. Governments can use top-down policy programmes to support them and provide them with the opportunity for exchanging knowledge and practices.
- Copyright clarity remains an important framework condition for OER and indeed for digital education, since legal uncertainty before OER practices will not disappear afterwards. But at the same time, the confusing situation in Germany can be considered one of the main drivers of OER adoption. The more the law fails to provide practical solutions, which make use of the potentials of the new technologies, the more OER appears to be a feasible alternative.
- Quantitative and qualitative information, monitoring and research are important for any educational reforms and therefore it is also just as important for OER activities. In this context, the authors would like to point to the relevant information, which could be attained for the German entries to the OER World Map. This tool should be exploited by other countries to fully highlight their own activities. However, this is not enough. Specific evaluations of programmes and practices are vital and it is unfortunate that the very positive OERinfo funding programme has not foreseen such requirements in the current funding round. The authors hope that other countries will remember this important element of change management.

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