Eduspaces Literature Review.

German and International Literature

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1 Preface

The aim of this report is to review literature in Germany [and other German speaking countries], and other international publication in respect of the relationship of education and learning and social spaces - virtual spaces - architecture.

This report is structured in three parts as follows. Part 2 describes the main change trajectories of the educational system in Germany and how this changes and influences socio-spatial structures and determine new challenges for the built environment. This context also shapes academic debates and the issues which are studied. In part 3 theoretical developments in social sciences, in particular, and the pedagogical literature are outlined. Some core concepts are introduced and selected current discourses and approaches in the German academic and political spheres are described. Part III will add further material based on a review of main academic and political debates.

Part 4 will be reviewing the relevant background literature other than that which relates directly to Germany or areas of Germany in the South Baltic.
2 The Educational System in Germany

2.1 Introduction

This section goes on to illustrate the main change trajectories of the educational system in Germany, and how these changes also influence socio-spatial structures and determine new challenges for the built environment.

The first section will very briefly outline main patterns of the current system. It has to be acknowledged that both social conditions as well as the educational institutions differ significantly between German regions. With regard to the social forces that challenge the educational system we find Germany has a great variation of economic conditions, the pattern and speed of demographic decline, the share of migrant population, and population density and settlement structures. In addition, the within the federal structure the political competences are on the Laender, which follow very different strategies to cope with these challenges.

In the following sections some major educational policy issues in Germany are briefly analysed in particular regarding the ways they shape functional requirements for schools and school buildings.

2.2 The Institutional structure at a glance

The German educational system is rather complex and, in many respects, also distinct from the educational systems of other countries. One reason for this is that the educational system is a task as well as a privilege of the Laender (the federal states). Thus, one might say that, in Germany, there is not a single system but instead, there are 16 different educational systems. However, the need for coordination of education systems is clear, and in this regard the German Laender already in the 1950s set up a coordinating body - the Conference of Cultural Ministers (Kultusministerkonferenz //KMK).

The KMK has continuously developed guidelines and standards to which all Lander comply. Thus, the German educational system can be understood as a set of common principles and standards, though there are considerable variations in the ways these principals are implemented¹.

Common principles, which are used to define the German educational system are obligatory school attendance up to the age of 18, the pre-dominance of public schools, the joint education

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¹ For a brief overview see (Kultusministerkonferenz 2014). A comprehensive overview is given by (Lohmar and Eckhardt 2011). Recent trends and debates are since 2006 covered in bi-annual national reports on the state of the educational system (Bildungsberichterstattung 2014b).
of children in primary schools, the tripartite school system at the secondary school level, two possible career paths after school - one being what is known as the dual system of vocational education and the other via higher education institutions (universities, colleges, academies), and the parallel structures for children with special needs (learning difficulties, disabled). This particular way of institutionalisation has brought about particular interfaces, which have a strong influence on individual career paths.

2.2.1 The first interface

Obligatory school attendance starts at the age of 6. Before this the attendance at pre-schooling and/or kindergarten are voluntary undertakings. With the change of the traditional family models, a greater integration of women into the labour market and, furthermore, the growing recognition of the importance of children’s early stage development for many habits and capabilities, the pre-schooling period has become subject to greater public concern. In particular, in the context of the integration of children of migrant origin, pre-schooling is seen as a necessary tool to ensure sufficient language skills. While there is growing effort to offer childcare facilities, parents are not obliged to make use of these facilities. [This will be discussed in 4 Integration] However, in most parts of Germany the demand has continuously outgrown the supply of childcare facilities.

School enrolment is the first interface which, in the established system, means the separation of „normal“ children and those with special needs. If a child displays a state of development that is below the expected minimum standard, there is the opportunity to either postpone enrolment for one year or to send the child along the special needs school path. Even today, ordinary schools and special need schools are segregated institutions, and are hardly ever interconnected in any way. Thus, there are also spatially separated and ordinary schools which do not meet basic accessibility requirements neither for the built environment nor in any other respect. However, following international agreements and due to the changes that have taken place, inclusion is now placed high on the policy agenda. Nevertheless, the pace of change is slow. For a child that has been diagnosed as having a learning difficulty it has been and still is - although not impossible - somewhat difficult to return to the ordinary school system at a later stage. The issue of inclusion will be discussed in greater detail in [3 Inclusion].

2.2.2 The second interface

The second interface - and for the careers of the majority of pupils perhaps the most important one - is set after primary schools. Here, a decision is made if pupils qualify for the Gymnasium - which offers, after 8 or 9 years - a direct path to the Abitur (comparable to A level Standard in Britain) and thus an opportunity to access University. Historically, to complete the German Abitur a further 9 years were required, but there has been an agreement - in line with most
European countries - to reduce this time to 8 years. These G8 reforms have caused much resistance by parents and organised interest groups, and remain unfinished or may be even reverted in some states.

In case pupils fail to qualify for the Gymnasium they either qualify for the Middle School (often called „Realschule“) or the Main School („Hauptschule“). Both types of school finish after 6 years, and offer lower school-leaving qualifications. Realschule generally offers a certificate that gives qualification to attend a number of high schools (secondary schools II), which themselves offer access to polytechnics or similar types of vocational education (but not to Universities). The main school generally offers a final degree that allows access to vocational education in the dual system. This is unique German vocational training that combines practical work as an apprentice in a firm, and 1-2 days a week of schooling provided by the state. [Since pupils leave these types of school at 16, two more years of obligatory school attendance is required].

Historically, there has been little flexibility in the system. Thus, if the decision after primary school was made, the career paths of pupils was then set. It is clear that a tripartite system is built on a social class system of industrial societies that divides ruling elites, administrative staff and workers. It came under increasing pressure with the decline of the industrial model, the opening of society since the 1970s and the increasing demand of the modern economy for a highly qualified labour force. The last forty years of school reforms in Germany can be described as a battle between both defenders and critics of the system. While attempts to abolish the system remained partial, increasing progress has been made for all for the vertical flexibility and to open gates for pupils to change earlier decisions at later stages of their school journey. Thus, with some extra courses pupils of the Realschule may presently earn a „qualified“ degree to attend the Gymnasium for the final years, while pupils of the main school may earn a „qualified“ degree either to complete the degree at Realschule or even, also, to attend the Gymnasium.

However, parent pressure to secure the best educational prospects for their child remains high. Although it is possible to move on the Gymnasium path later, school selection, after primary school, remains highly controversial. There is much debate that has postponed this decision to a later stage. As a consequence, the first two years of the secondary education have been transformed into an „orientation phase“ during where pupils my reverse an earlier decision and change the school type usually on the basis of teacher’s recommendation. In most states this orientation phase is taking place in the tripartite system. Yet, some states (for instance Mecklenburg-Vorpommern) have formed a new, integrated school type only for the years 5 and 6. Here, as a consequence the choice of the school system is successfully avoided
and postponed after year 6, but the cost for this is that pupils must change their social environment two times within a three year period.

There have been many attempts by some Länder to form integrated comprehensive secondary schools, which offer varying types of degrees in one place. However, since there has never been an agreement of all Länder in the KMK\(^2\), the basic regulations of the existing systems have never been changed. Therefore, in practice, comprehensive schools tend to reproduce, internally, the tripartite system. However, with regard to the built environment in comprehensive schools these are located in one place, while the tripartite school create a spatial as well as a social differentiation.

### 2.2.3 The final interface

The final interface is set after leaving school, when pupils are passed on in the system of vocational and higher education. For pupils of Middle and Main Schools, which did not achieve a qualification for the Gymnasium, this interface is set after the end of the secondary I phase. The only perspective for those, who finished with a Main School degree (Berufsaufeife) the path is set into what is known as the dual system. Those which obtained a degree of the Realschule (mittlere Reife) may opt between the dual system and further secondary (II) schooling in vocational academies and colleges, who in turn, prepare for an advanced technical college certificate that then qualifies for the attendance of a polytechnic or advanced technical school. In recent years, the Bologna Reforms have brought about a considerable opening and permeability of the system in the way that these degrees limit the scope of subjects, which can be studied. These are still limited, but the qualification level (Bachelor degree) is equal to a first academic degree which can be obtained at a University.

However, despite this and in the face of declining job prospects for employees with lower qualifications and an increasing demand for a highly qualified workforce, the priority of the majority of parents is to secure the Gymnasium path for their children, which offers all opportunities. At the same time that main school is increasingly perceived as a dead end. Accordingly, over the last decades the school system has envisaged a fundamental quantitative restructuring. While the Gymnasium has become the dominant school type, the other school types, particular the former dominant main school envisaged a heavy decline of pupil numbers. In the year 2012/13 33 percent of all pupils in the secondary I phase (stage 5 to 10) attended a Gymnasium, about 24 percent a middle or “Realschule” while only 13 percent attended the

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\(^2\) Since the Länder are independent and cannot be forced to agree every state has veto power. Agreements of the KMK reflect the least common denominator of all Länder.
main school. A further 12 percent attended a mixed school that offered multiple degrees (Bildungsberichterstattung 2014a Tabellenanhang D1_1A).

However, this trend has come under considerable pressure through a fundamental demographic shift, which is underway in German society. As a consequence of a major driver of reform in the German education the number of pupils is declining. This will be subject to further discussion in the following Section 2.3.2. The only aspect that is mentioned here is that this has forced the Laender to reduce the number of schools at the expense of the diversity of schools. Some Laender have created a new school type - the regional school - which merges the former middle and main schools, but - unlike the integrated comprehensive school - does not include the Gymnasium strand. In the face of declining pupil numbers and centralisation of schools the number of integrated schools of both types has increased while the number of middle and main schools [as well as pupils in these schools] have decreased significantly during the last decade. The number of gymnasiums remained relatively stable, with a moderate decline of pupils in line with the overall trend.

2.3 Current trajectories and challenges

2.3.1 Declining Number of children and Schools

One major challenge for the German educational system is population decline and – in connection with it - a declining number of pupils. From 2006 to 2012 the number of pupils in primary schools and secondary I schools (up to stage 10) decreased by almost 12 percent from around 8 million to 7.1 million. This trend is set to continue. This is a general trend, but with significant regional variations. Political administrations have attempted to respond to this development with a concentration process of school locations. In response, some federal states, particularly in the former East Germany, where the population decline is particularly pronounced, have merged Middle and Main Schools to regional schools, and have thus effectively transformed the tripartite into a bipartite educational system.

Particularly in rural areas, the reduction of the number of school locations means that pupils have to travel longer distances to attend school. In rural areas public transportation is limited and bus schedules are rather inflexible. Thus, in these more centralised schools new organisational (supervision, catering) and spatial requirements become more prevalent such as lounges and recreation rooms for travelling pupils, catering and canteen facilities as well as workspace. The mainstream discourse sees this development as an additional argument to transform the currently predominantly part-time schools into all-day schools (Arbeitsgemeinschaft der Akademien Ländlicher Raum in den deutschen Ländern 2010; Fücker, Otto, and
Leyda 2015) (see also 2.3.5 All-day Schooling). Even further, many parents seek accommodation facilities for older pupils that is located closer to the central school in an attempt to reduce travel time, even if the school is not a boarding school.

However, this centralisation process has faced strong opposition in rural areas. Villages and small communities often see their future prospects vanish, when (primary) schools are closed. Alternative approaches seek to maintain even very small schools (Fücker, Otto, and Leyda 2015). Such models require rather different solutions and are often connected with innovative usage models of IC technologies, as well as the mobilisation of self-help capacities of rural communities.

In many rural region, where the state has strongly enforced the centralisation process, private schools have mushroomed and offer alternative facilities in many regions.

2.3.2 Inclusion

As a consequence of the UN Convention on the Rights of Persons with Disabilities that came into force in 2008 (United Nations 2008) and was ratified by the German Bundestag in 2009, the traditional segregation of pupils with learning disabilities from non-disabled pupils in the German education systems must be overcome. The main principals of the convention is the „Full and effective participation and inclusion [of persons with disabilities] in society“ and „accessibility. “

In 2011, the German government published an action plan (Bundesministerium für Arbeit und Soziales 2011) for the implementation of this convention that particularly focuses on public spaces, which includes schools. Accordingly, the KMK outlined a process, in which the „integrative school“ was defined as the common future school model, and the existing segregation of handicapped and disabled pupils from ordinary schools should be overcome (Kultusministerkonferenz 2011). Some Laender have already changed legislation in this regard, and have formerly defined the integrative school as the standard model of primary and secondary schools. In practice, however, many obstacles - e.g. lack of knowledge and experience of all related stakeholders, dearth of teaching concepts, legal and safety issues, and - very importantly - new requirements of the built infrastructure have until today hampered enthusiasm.

In the face of the history of the German educational system, inclusion requires foremost, institutional and cultural changes, and is going along with the development of new teaching and

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3 In the German educational policy context the term “inclusion” is used in a narrow and specific way. It solely addresses the inclusion of such children with special needs, which require a specific pedagogical treatment - what is called - “Sonderpädagogik” (Special education).
learning approaches (Schmidt 2014; Werning 2014). The debate cannot be fully captured here. However, the changes are fundamental. Inclusive pedagogy and didactic is learner-centred and emphasises autonomy and self-determination of children and focuses on the heterogeneity of accesses/views to a shared topic. It is assumed that only by facing the plurality of life and lifeworlds this opens the chance to develop an understanding of the world in its entity. Thus, difference does not imply better or less worthy. Yet, schools and kindergartens in the German speaking country remain teacher-centred and deficit-focused (defizitorientiert) (Feyerer 2012).

In the context of inclusion, the built environment is also among the heavily contested issues, since barrier free schools often require costly changes. The CRPD sees „universal design“ as the basic principle for the design of products, environments, programmes and services. According to this principle all objects and activities have

„to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design. Universal design shall not exclude assistive devices for particular groups of persons with disabilities where this is needed.“

In the context of the German integrative school debate the main issues are particularly emphasized with regard to barrier-free schools: usability/accessibility and safety. These issues are summarised in three design and planning principles (Unfallkasse Nordrhein-Westfalen 2014):

- orientation at the most extensive requirements;
- the two senses principle;
- the two channels principle.

The first principle suggests that design of structural elements, furniture, equipment, devices, but also signposting and information etc. should be oriented at the requirements of those groups with the most extensive needs. It is argued that if the principle is met, all differing requirements of various groups are also met.

The two senses principle is particularly important for the design of buildings, equipment and information systems. According to this principle at any time at least two of the basic three senses (hearing, seeing, touching) have to be addressed. The information intake through two senses guarantees the usability of the school and its interior for the vast majority of pupils.

4 see also the special issue of the online Journal “Zeitschrift für Inklusion” on didactics of heterogenous groups.
Even for unhandicapped persons to address multiple senses is useful, when important information has to be transmitted (e.g. that’s why an alarm makes noise and flashes).

The two channels principle says that in situations when individuals may not have the capability or ability to make use of a product, a second, alternative option should instead be available. For instance, if an individual cannot climb the stairs, a ramp or elevator must be made available. If somebody cannot see a picture, there should be an audio description or some braille text made available that offers similar information.

On the basis of these principles standards for barrier free planning and construction of public buildings have been defined and summarised in the DIN 18040-1 (Deutsches Institut für Normung 2010). The DIN 18040-1 covers standards for

- Outdoor facilities (parking spaces, pathways and transport areas, outdoor spaces) and the entrances;
- Indoor development (corridors, doors, floor coverings, elevators and escalators, stairs, ramps, wheelchair parking spaces)
- Information and Warning Systems (Displays and Control elements, communication systems, equipment elements, service counter and registers, vending machines, alarming and evacuation)
- Premises/classrooms (general requirements, furniture, sanitary installations, sport and swimming facilities, washing rooms, showers, dressing rooms, restrooms, emergency systems).

Accessibility also addresses ICT usage and virtual spaces. Even up to now, no similar standards have been defined. Some orientation is given by the federal directive for barrier-free information technologies (Bundesministerium für Arbeit und Soziales 2011). However, this directive is legally binding for the federal ministries and agencies.

There is much debate, in how far the design principles and the standards have to be applied, since they define maximum standards rather than minimum requirements. While this approach seems to offer a good orientation for the construction of new school buildings, the costs of reconstruction of existing buildings can be very high. This is particularly the case if the number

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5 DIN-Norm are usually voluntary, mostly industrial standards, which are defined by work groups organised by the Deutsches Institut für Normung. They are based on the state of the art knowledge in science, technology, and practical experience of the industries. Through public often state recognition they become de facto legal standards in many areas. In case of DIN 18040-1 this is the case, since it is a legal requirement to refer to this norm in the planning and construction process of school buildings. DIN-Norms are not static, but are adopted and modified on a regular basis, if professional communities require this.
of cases is small. Thus, in many cases partial solutions are a more reasonable, and sometimes, it might even be appropriate to substitute reconstruction of buildings by extra services and additional institutional arrangements for disabled pupils.

Further, often it is practically impossible to transform existing buildings into a barrier-free environment, and sometimes barrier-free standards are in conflict with other objectives such as historical monument protection (Denkmalschutz) or safety standards.

2.3.3 Migration/Integration

A second educational policy agenda of social exclusion/inclusion is migration and the inclusion of families and children with migration backgrounds. In the German educational policy context this is usually subsumed under the label “integration.” The history of immigration in Germany has recently triggered a lively public debate on German identity being de-facto a multi-cultural society. Despite huge differences in worldview this debate has helped to address the impacts of an increasing population with a migrant background on the educational system, the school performance of children of migrant families, but also the impact of these changes on the school performance of all other students.

The KMK has defined a set of basic principles, which should be met by schools and teachers (Kultusministerkonferenz 2012). It is calling for a cultural change according to which heterogeneity should be seen as normal and has a potential. Main concerns are language skills and inter-cultural competences. Many migrant children have only poor German language skills, since families at home speak their native language. Since school performance is crucially dependent on language skills, these children face great difficulties in keeping pace with their fellow students. At the same time they are not trained in their native language. As a result they speak and write neither language well. There is a shared understanding that two approaches are considerably important to tackle this challenge:

- increasing importance of pre-school learning including language (German and native language) training for migrant children and their parents and
- school-parent partnerships: the involvement of parents in the learning process (language, learning, communication of expectations/requirements, etc.).

Accordingly, the learning functions of the school are extended to a social function, which requires better integration of learning and social work (see Sozialraum-Analyse). This is enforcing the trend towards all-day schooling (see for details Resume: On the way to inclusive all-day schooling).
2.3.4 Digitalisation of Schools

2.3.4.1 Media Education

In 2012 the KMK agreed on a resolution about „Media education at school“, that summarised a shared vision of the German Laender Ministries of education of the ways to deal with the new media at school. This has been the second publication of its kind, a first similar resolution was published in 1995. However, this second resolution is more than an update. The German educational system has not been at the forefront of ICT mania, instead scepticism about ICT usage at school used to be high. However, since 1995 the ICT revolution has gathered pace in the new millennium, and even the most reluctant schools nowadays have adapted to the new media in one way or another and is confronted with a generation of pupils that has access to smartphones, mobile devices and computer games already from a very young age. At the same time, the longer the ICT revolution is underway the more not only its potentials and benefits become visible, but also the downsides and new negative phenomena became apparent. In this context the KMK has - as the title of the resolution indicates - applied a broader, pedagogical approach to the new media that does not simply understand these media as tools for education, but instead emphasises the need to develop the pupils media competencies in order to be capable of acting self-determinedly, creatively and socially responsibly in a society in which these new media mean a reality.

„Media education is a permanent, pedagogically structured and guided process of constructive and critical debate with the media world. It aims at the acquisition and continuous expansion of media literacy; So that knowledge, skills and abilities that enable up an adequate self-determined, creative and socially responsible behaviour in the media-shaped living world. It also includes the ability to responsibly move in the virtual world to understand the interaction between the virtual and physical world, and to recognize the risks and dangers of digital processes alongside the opportunities“
(Kultusministerkonferenz 2012, Orig. German)

Media Competence therefore is the key concept. It is seen as a cultural skill that adds to and is built on other (traditional) cultural skills such as reading and writing etc.. Further, it is also understood as an indispensable key competence in almost all professional fields. It is argued that media competence cannot be learnt in the family context nor through the individual usage of the new media alone. This is why schools have to offer a fundamental, comprehensive and systematic media education.

Thus, the new media not only has to support education and learning processes, they have to also become the subject of education. Media education at school encompasses both learning with media and learning about them.
The federal states differ in the ways in which they try to achieve this goal. An exemplary way to deal with this media education is the „Media Pass NRW.“ It consists of three elements that are built on one another:

- A conceptual „competence framework“ that describe media competences to be achieved.
- A curriculum (Lehrplankompass) for teaching at different stages that is derived from the competence framework
- Implementation guidelines that include didactic tools, but also discuss infrastructure requirements and describe qualification requirements for the teachers.

At all competence levels and for all media the competence framework highlights the following five key competences:

- Operation and Usage (Bedienen und Anwenden)
- Research and Inquiry (Informieren und Recherchieren)
- Communication and Cooperation (Kommunizieren und Kooperieren)
- Production and Presentation (Produzieren und Präsentieren)
- Analysis and Reflection (Analysieren und Reflektieren)

For the implementation of the guidelines schools are encouraged to develop a comprehensive media plan (Medienkonzept). This should address the following issues:

- Curriculum development (which media shall be used for the development of media competences at which stages and in which courses?)
- Infrastructure requirements (Hard- and Software, Internet Access)
- Training requirements (Which didactic skills are required for the integration of the new media in the specialised classes (Fachunterricht)?)

While conceptually the educational system appears to be well developed, the implementation process, however, is rather slow. While there are also positive examples, in the majority of schools neither WLAN, Intranet, a learning platform nor interactive whiteboards are available (antene com 2014, Medienbildung in deutschen Schulen). The major issue is not a conceptual one but rather a financial one. The financial responsibility is with the school authority - usually the cities and municipalities. These suffer from budget constraints.

Thus, the Bring-Your- Own-Device approach (BYOD) is common, that assumes that pupils can make use of the own laptops and pads. However, this approach does exclude poorer families and also is connected with technical (multiple systems, availability of software), pedagogical as well as legal constraints. On the other hand, full equipment is costly, so that in good practice examples mixed approaches are applied.
A further barrier is the lack and the access to educational content that can legally be used. However, increasing effort is undertaken by the Laender and the Federal State to provide access to Media Portals and Open Educational Resources (OER).

Finally, a major impediment is the lack of technical support for the schools and the teachers.

2.3.4.2 Schools and Social Media

As organisations schools are embedded in the community and the wider society. In recent years, the new Social Media have radically transformed the ways in which we communicate - internally in organisations, but also across the boundaries of organisations. Today, most schools seek ways in which to use social media for the internal (teacher-teacher, teacher-pupil) and external (parents, wider community) communication. The lack of a sufficient ICT infrastructure in many schools has encouraged teachers and schools to make use of existing social media (such as Facebook, Google and WhatsApp). This has blurred the borders of the school and between the public and the private, and raised issues of data protection, legal content, rights of informational self-determination and cyber-bullying.

With regard to data protection the main problem is that commercial social media providers (particularly Facebook) have access to all information and data published inside of the systems. Thus, any communication in (even closed) social groups or forums means that protected personal data is transferred to a third party. This is against the data protection requirements of the public sector and therewith an illegal act, particularly if parents have not explicitly declared consent to share this information for a specific purpose. Since it is unclear how providers such as Facebook will make use of the data, it is de facto impossible to restrict the usage of this private information (see for example the „Hinweise zur dienstlichen Nutzung von sozialen Netzwerken an Schulen“ by the Sächsische Staatsministerium für Kultus (Sächsisches Staatsministerium für Kultus 2014). Thus, the Laender have made it clear that it is regarding data protection requirements illegal to communicate any school related personal information (e.g. grades, assessments, personal advice, sick notes, accident notifications, complaints, photos) via Facebook. Even further, due to the right of informational self-determination it is also illegal to force pupils, parents or the staff to join a private social network such as Facebook, since this de facto requires a compulsory disclosure of private information.

A further common experience is that the overlap of private and professional usage may trouble teacher-pupil relationships. Typical functions as „making friends“ and „likes“ reduce the professional distance and may be misinterpreted - by both pupils and teachers, but also the parents - in ways that negatively influence the educational process. Thus, the current advice to teachers is not to privately engage in social media or, at least, keep pupils out of their own private sphere.
Since communication through commercial social media is communication in the public sphere, further legal issues constrain their usage. Some issues must also be considered when schools maintain a public webpage and/or a public weblog or forum. According to recent jurisprudence in Germany, institutions and individuals that run a blog or a forum can be made responsible for all published content. In the case that illegal content is published the providers may be charged. Most commonly legal problems occur when pupils publish content for which the school and/or teachers are made responsible.

A further crucial issue is the protection of intellectual property rights. The use and copying of material at school and for private purposes is legally privileged. When content is made public, intellectual property rights are violated, and schools and teachers may be charged for such violations.

Cyber bullying is a phenomena that is closely connected with the rise of the new media and particularly new social media. Although it is a general phenomenon, it is particularly prevalent in youth culture and therewith an important concern in educational systems. In social networks discussion and conflicts between pupils may escalate in ways that may have far-reaching consequences.

In the face of these discussions there is clear focus on closed, self-organised platforms in schools to avoid most obstacles. Since most schools are not able to run such systems by themselves some Länder have offered centralised solutions (e.g. the Hessian Schul-Moodle). However, it is not always possible to maintain close borders. In order to avoid property rights issues another approach is the provision of open learning content.

**2.4 Physical activity and nutrition**

Modern technologies have fundamentally changed the ways we work and live in modern societies. Some scholars speak about a „sitting live style“ which characterises modern life. Its main patterns are a shift from predominantly physical to cognitive work, the increasing reliance on new information and communication technologies at work but also media consumption at home, changing mobility patterns (car driving) and the increasing reliance on prepared and convenience food.

In school life these patterns have been reinforced by changing household structures (households with single children), increasing media consumption of children and teenagers, long school hours, as well as unfavourable and almost dangerous (e.g. due to traffic) public urban spaces.
As a consequence problems relating to a child’s lack of physical exercises such as movement disorder, limited body control and mobility, hyperactivity (disorder), and overweight and obesity have gained increasing prominence. The combination of the lack of physical exercise and malnutrition does not only mean a reduction of quality of life in the short term, but will supposedly have long term health problems, and related diseases (high blood pressure, diabetes) are considered to be among the most important public health issues in the near future.

In recent years it has become apparent that modern life requires a fundamental shift of attitudes and habits of members of society. It is impossible to extort such changes from any person. Rather, it requires a long process, in which mental frames, but also conditioning social and physical structures have to be transformed in a way that individuals are willing, enabled and encouraged to change their everyday routines. In this line of argument, the German Government has setup the INFORM programme to initiate and coordinate projects on all levels of the society that inform about and encourage a healthy diet and physical activities.

In addition, a health reform is on the way that focuses on prevention. It is the objective of this reform to tackle life style related health risk such as malnutrition, lack of physical exercises, stress, smoking, and alcohol consumption. The new legislation seeks to encourage and support all citizens in adopting a healthy lifestyle, which is appropriate for their individual circumstances.

In such a process, schools play, again, a fundamental, double role in a way that they there are socialising institutions, in which knowledge and mental frames are built, and that they are themselves places of living, which have to be transformed.

Several different strategic elements have been summarised among the concept of a Moved School („Bewegten Schule“) such as:

- Activation of pupils /animated teaching
- School sports
- Physical activities in breaks (Bewegungspausen)
- Design of furniture
- Food Health education

Beyond the school gate this problem also requires the development of public spaces, the provision of secure physical recreation facilities. And again, the school has to be seen as the partner in wider (local) networks that promote healthy lifestyles.
2.5 **Resume: On the way to inclusive all-day schooling**

The German educational system is under reform pressure due to

- the ratification of the UN Convention on the Rights of Persons with Disabilities. It requires a fundamental shift of the pedagogical model towards joint lessons of heterogeneous groups. The increasing cultural diversity in German society through immigration is putting additional pressure in the same direction. At the same time collaborative school-parents relationships/partnerhships are even more crucial.
- changing family structures and labour markets, but also the reduction of school years (G8), require an organisational shift from part-time to all-day schooling.

Inclusion and all-day schooling have strong implications for the school architecture. In addition to the development of didactic concepts, and sufficient personal resources, the transformation towards integrative all-day schools also requires re-design of existing and innovative designs of new school-buildings.

In all-day schools they are not only learning, but living spaces, in which students spend an increasing amount of their time. From the perspective of the students the school can be separated in six phases, which each have different spatial requirements (Reich 2012):

Students attend schools according to flexible schedules to learn, repeat, experiment, talk, play or just to “chill.”

Directed and self-managed forms of learning alternate.

Eating and drinking, physical activities and regeneration, conversation, counselling and communication are fixed elements of the daily schedules.

The promotion of individual interests and talents has to be ensured.

Collaborative projects and presentations are not an exception, but the rule. This requires spaces for performing, documentation and archiving.

After classes students do not hurry to escape from school, but stay to work in groups or in activities for the neighbourhood, events, sport etc.
Table 2-1: Activities that have to be considered for the space offer of an all-day school (Reich 2012).

<table>
<thead>
<tr>
<th>Activity</th>
<th>Spaces/Areas of Activity</th>
</tr>
</thead>
</table>
| Eating and drinking                   | Indoors: canteen, preparation kitchen, common room for kitchen staff, storage and cold stores, waste disposal room, bathrooms, dressing room, students’ kiosk, water dispensers etc.  
  Outdoors: covered seats, kiosk with covered forecourt, water dispensers etc. |
| Getting together with other students  | Indoors: cafeteria, tearoom, cybercafé, room for lending and playing board games etc.                                                                    
  Outdoors: covered area (rain shelter/sun shade), cafeteria seats, barbecue area, seating accommodation, seating steps, bathrooms that are accessible from the school playground etc. |
| Getting exercise                      | Indoors: table tennis, billiards, table football, dance studio with mirrors etc.                                                                          
  Outdoors: covered area (rain shelter/sun shade), storage room for outdoor equipment that is accessible from the school playground, play areas (e.g. for table tennis, a goal wall, for street and beach volleyball, a climbing wall), ‘active playground’ for primary schools with campfire spot, watering place, building shed, walls for painting, climbing scaffold etc. |
| Retreating, resting, doing nothing    | Indoors: library, reading corner, aquarium, ‘room of silence’ (meditation), relaxation room with loungers, sick room etc.                                      
  Outdoors: swings (not solely for the “small ones”), lawn, strolling path, seating accommodation etc. |
| To do homework                        | library, workplaces with Internet access, working areas etc.                                                                                               |
| Trying out, producing, designing something | Indoors: workshops with storage rooms (e.g. bicycle workshops, video editing, school radio, wood, metal, ceramics, electronics, model making, textile, kitchen), cubicles for practicing an instrument, room for the school band etc.  
  Outdoors: school garden, pond, zoo for small animals, aviary etc. |
| Presenting, showing, performing something | Indoors: assembly hall, foyer with exhibition walls, dressing room, bathrooms, lighting and sound control, chair storage, prop and scenery room, make-up room, puppet show etc.  
  Outdoors: “Green” classroom/open-air theatre, sculpture trail etc. |
| Celebrating festivals                 | Connection between canteen and assembly hall, disco room etc.                                                                                               |
| Getting help                          | Office for social education workers, office for guidance counsellors, infirmary, arbiters room, room for the student representatives, room for parent-teacher conferences etc. |
| Getting together with teachers        | Individual teacher workplaces (including storage compartments, power and printer connection, meeting area), informal meeting places for teachers (balcony in front of the teacher’s room, staff cafeteria in the canteen) etc. |
Table 2-2: Space requirement of an inclusive school (Reich 2012).

<table>
<thead>
<tr>
<th>Need for</th>
<th>Spaces/Areas of Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Therapy</td>
<td>Rooms for therapeutic work, e.g. for physiotherapy or rhythmics</td>
</tr>
<tr>
<td>Retreat and rest</td>
<td>Relaxation rooms for students who have problems with longer phases of concentration or who are exposed to particular mental challenges in their respective environment; sheltered rooms for students who have a greater need for peace and quiet and to retreat, e.g. in the case of severe disabilities and more complex needs for assistance</td>
</tr>
<tr>
<td>Hygiene</td>
<td>Specific sanitary facilities for children with serious disability issues and an increased need for assistance for their personal hygiene, if necessary additional space for nursing that requires more than the installation of a disabled toilet, rooms with washing machines and tumble dryers</td>
</tr>
<tr>
<td>Health care</td>
<td>Room for the patient personnel/first aid post for the safe storage of medicine for children who need special medical treatment, if necessary to be used as a school social station or room for health care, if for example patient personnel is present at regulars hours</td>
</tr>
<tr>
<td>Technical support</td>
<td>Suitable storage areas for wheelchairs or other technical support systems in front of classrooms, subject-specific classrooms, and other frequented dwelling areas such as the canteen, assembly hall, self-study centre/library</td>
</tr>
<tr>
<td>Peers among themselves</td>
<td>Sufficient study rooms in which study groups can work temporarily together</td>
</tr>
<tr>
<td>Vocational preparation</td>
<td>Workshops, i.e. for educationally handicapped students, in which the vocational preparation during secondary education constitutes an important part of their activities</td>
</tr>
<tr>
<td>Consultation</td>
<td>Acoustically treated consultation rooms</td>
</tr>
<tr>
<td>Accessibility</td>
<td>Exceeding the statutory requirements, there are a variety of further creative possibilities to make all school sectors accessible without restrictions. This has to be considered early on in every planning process and has to be implemented wherever possible.</td>
</tr>
</tbody>
</table>
3 Social Space - Virtual Space - School Architecture

In this section main theoretical developments in social sciences in particular and the pedagogical literature are described. Some core concepts are introduced and selected current discourses are described.

3.1 Changing Understanding of Spaces

The German academic debate has seen an increasing interest in spatial aspects of pedagogy. This “spatial” turn may be considered as an element of two major theoretical developments in social sciences in recent years: the new sociology of space and the “practice turn” in social sciences.

In the last two decades, social science thinking about society and space in Germany has fundamentally changed. With her seminal publication on “Sociology of Space” Martina Löw (Löw 2001) has opened a gateway for a review of the socio-spatial relationship in all fields of human studies including pedagogy. Löw offered a timely review of general theoretical developments as well as empirical findings, and therewith encouraged researchers in various fields of social sciences to engage in spatial analysis. Löw has sought to overcome the idea that the social and the (physical) space are separated entities, where only space seems to have influence on the social, while the social does not change space. This traditional view of an objective physical space that serves as a container for the social and as a given structures shapes social practices has shown to be insufficient, when well-known social phenomena such as the spatial isolation of groups and life worlds, the process of globalisation and the evolution of virtual spaces are investigated (ibid, 1–30pp.). Thus, she tries develop a relativistic understanding of space, according to which

- space does not only structure social practices, but is constituted, transformed and reproduced through social practices;
- space is not static, but dynamic.

Löw describes space as a relational order/arrangement of bodies and social objects, which are continuously moving, so that the arrangement itself changes permanently. Space is constructed through two independent processes: spacing and the performance of synthesis (Syntheseleistung) (ibid, 198pp.). She defines spacing as the process of placing of objects and people or being placed. According to Löw spaces and places have to be distinguished. Places are small, tangible and nameable units, where objects or people are placed. While spacing is described as social actions, synthesis points to the symbolic effect of places that is required for the cognitive representation of the world. Löw describes perception, remembrance and
abstraction of three cognitive acts of synthesis. While spaces and places remain separated in processes of perception and remembering, in the process of abstraction places vanish and only the social objects are of interest that are confined to spaces.

The “practice” turn in social sciences refers to a more recent theoretical development, according to which human actions are situated practices - practices, which are situated in space and time.

A ‘practice’ (Praktik) is a routinized type of behaviour which consists of several elements, interconnected to one other: forms of bodily activities, forms of mental activities, ‘things’ and their use, a background knowledge in the form of understanding, know-how, states of emotion and motivational knowledge. A practice – a way of cooking, of consuming, of working, of investigating, of taking care of oneself or of others, etc. – forms, so to speak, a ‘block’ whose existence necessarily depends on the existence and specific interconnectedness of these elements, and which cannot be reduced to any one of these single elements (Reckwitz 2002, 249).

Practice theories highlight the interconnectedness of body, mind and things. The spatial perspective on human behaviour is closely connected with the idea of the corporeality of human beings. Following this line of thinking “learning” is more than just a cognitive act, but also has to be understood as a social practice. Some scholars have described the adaptation of practice theories in pedagogy as a “return of the body” (Wulf and Zirfas 2014, 103), which also has allowed for a greater recognition of human senses.

Still, it is important to note that practices theory should not be misunderstood as a return of a biological determinism. Rather, it is argued that bodily expressions (e.g. gestures), and senses are culturally formed. What we like, enjoy, hate, avoid is not simply determined by our biological apparatus, but is shaped in the socialisation process. As the definition of practices above highlights, it is ‘not-either’ or it is ‘both.’

The practice turn has brought about a growing interest in various body aspects like senses (taste, feel, smell, see), emotions (joy, anger, fear, grief, disgust), movements (sitting, walking, jumping, running, sit-steps, teetering), gestures (waving, declining, ……), or the use of the voice (whispering, shouting, speaking singing etc.) (see for instance the contributions in (Wulf & Zirfas, 2014, p. 103).

Two aspects have to be mentioned. Firstly, spatial analysis is always connected with time. Human behaviour is situated in space-time (Giddens). Students may stay in a class for some time, but during the day pass through and stay in various places. Practices describe these regular patterns - the daily routines of staying, moving on, passing through and the meanings with which these time-spatial patterns are connected (having a class, being at home, doing homework, having a break, playing, etc.).
Secondly, although the “practice turn” in social and cultural sciences and anthropology may be seen as the general theoretical development, that broadly shapes the current interest in spatial analysis also in pedagogy, many studies do not explicitly refer to this line of argument. There are other, often more ‘applied’ approaches that also influence academic and political debates as will be mentioned later.

However, if we follow the argumentation of Reutlinger, outlined in an often cited publication (Reutlinger 2009), then these shifts have changed the academic discourses, while the educational policy debate is still firmly based in the “container model” of space. In the (German) educational policy debates - and the concept of Bildungslandschaft in particular - (see section Bildungslandschaft on page 26) space is treated as a number of places, where educational subjects and institutions are active and where educational processes take place. Space is constructed as parallel existing places in a territory. A paradigm shift from places to spaces is still missing. It would be a requirement to analyse the social constitution of educational spaces. If this paradigm shift does not take place, he sees a tendency of reification of education, in which all forms of spaces and forms of learning are integrated and subordinated under the dominant educational paradigm of school based learning.

3.2 Social Spaces: Terminology

In the German pedagogical literature we find an increasing number of concepts, which relate to learning and space. Although some of these concepts are used differently by different authors, there is some commonality in the ways in which and how certain concepts are applied.

3.2.1 Lernraum (learning space)

This comparatively recent concept seems to serve as a container concept, which is used to generally address the relationship between learning and space. Often Lernraum is used to broadly discuss various aspects of the socio-spatial relations, which are then broken down to more specific perspectives such as spaces of cooperation or virtual spaces (e.g. Witter/Diettrich/Walber 2015). In this sense, Lernraum is a meta-concept that seems to include most of the concepts discussed below. However, occasionally, Lernraum is used almost interchangeably with the concept of Lernumgebung (e.g. Rummler 2014).

3.2.2 Lernumgebung (learning environment)

This didactic concept is frequently used, particularly in the context of e-learning. The concept of Lernumgebung centres the focus on the individual learner. Its importance for e-learning derives in particular from the (spatial) separation of teaching and learning situations - or Lehrrumgebung (teaching environment) and Lernumgebung (learning environment). In this sense virtual environments constitute specific Lernumgebungen for individual learners. However, the
concept can also be applied to any learning situation, when the focus is put on the learner. This concept especially corresponds with cognitive-psychological theories, the individuals’ cognitive perception of learning situations and conditions, as well as individual strategies to adapt and cope with a given context and making use of existing opportunities.

3.2.3 Lernort (learning place/location)

Lernorte constitute spatially situated learning situations. This may be a classroom, but it can also be a work situation in a firm, an excursion to a nature site or a visit to a museum etc. The concept of Lernorte is particularly important in debates about vocational education in the German dual systems, in which learning at secondary school is combined with practical training on the job. A third institutional setting in this type of education is often specialised academies in which students receive intensive training on topics, which can neither be provided by ordinary schools nor firms (e.g. training to use machines that are neither available in all firms nor in schools). In this context Lernortkooperationen (cooperation between learning places), the interplay between different institutions (firms, schools, academies) are a major issue of concern. Thus, the research on Lernorte belongs to the disciplinary core of vocational educational research in Germany (Dehnbostel 2002).

However, the increasing interest on the spatiality of learning has also supported a greater prominence of the concept in other debates addressing learning situations outside of schools (field trips, excursions, internships etc.) and learning in informal settings (at home, with friends etc.).

3.2.4 Sozialraum

While - as mentioned above - the concept of Lernraum serves as a container to address the social-spatial relationship in educational contexts, the concept of Sozialraum has received very specific connotation in the German debate. The literal English translation of Sozialraum is Social Space. However, a literal translation does not reflect the specific way of how this term is used in German academic and political literature. This concept has its origins in the field of social policy and youth work, and has been extended to schools as central local institutions in this policy field. In recent years two agendas have contributed to its increasing popularity in policy debates: the increasing concern for social integration in urban settings, in which students with diverging migrant backgrounds have become increasingly important, and the restructuring of the institutional youth work context through the shift towards all-day schooling. Thus, Sozialraum refers to the life worlds of students and Sozialraum analysis is focussing on the embeddedness of schools in local neighbourhoods. This concept will be discussed in greater detail in the following section.
3.2.5 Bildungslandschaft (Educational Landscapes)

Bildungslandschaft describes the institutional forms of learning situations. Originally, it was used in a rather general way to describe the totality of educational institutions in a state or region. With the increasing awareness of informal forms of learning this concept has received a new, more specific meaning. Bildungslandschaft describes the space that is created by the two dimensions degree of formalisation of the learning process (and learning objectives), and the degree of formalisation of the learning situation (the setting). The focus of this concept is the acknowledgement and inclusion of informal forms of learning and Lernorte. Thus, it extends to focus beyond the formal educational institutions. In a spatial perspective the Bildungslandschaft is close to the idea of the Sozialraum. However, while Bildungslandschaft is exclusively addressing learning processes, Sozialraum also covers non-learning situations, and its relation to learning processes.
3.3 **Sozialraum-Analyse**

Sozialraum-Analyse (SRA) can be seen as a conceptual approach for social work. In Germany, the SRA currently has become a mainstream concept, and is applied in many communities particularly (but not only) in the field of local child and youth work. In the field of social pedagogy authors such as Fabian Kessl und Christian Reutlinger (Kessl and Reutlinger 2010), Ulrich Deinet (Deinet 2009; Deinet 2010; Deinet 2014; Deinet et al. 2010) und Wolfgang Hinte (Hinte 2006; Hinte 2012) shape the current debate.

The starting point of SRA is the adoption of the phenomenological and sociological concept of the “Lifeworld” as it has been developed by Alfred Schütz, Berger and Luckmann and Habermas. However, SRA is rather an applied concept than a new theoretical approach. It seeks to design local lifeworld in ways that individuals - even if they are in precarious situations - are able to get along based on their own efforts.

The idea of life worlds places the subjective perceptions and interpretations and everyday routines of individuals, into the centre of the analysis. Subjectivity is neither “right” nor “wrong”, yet it is constitutive for individual everyday practices and routines. Thus, lifeworld analysis requires a qualitative approach that seeks to “understand” such subjective views and interpretation (“Verstehen”). Such a qualitative approach is also required to make individual, subjective needs transparent.

However, it is argued that subjective perceptions and practices in everyday life are focused on smooth operation. Such everyday routines are rarely reflected and adjusted. Dialectically, while efficient routines evolve to cope with everyday life efficiently, at the same time these routines may make us “blind” for changes and may hinder us to modify routines.

Everyday experiences shape the individual life worlds, the ways of thinking, interpretative frames and daily routines. Space is one dimension of the lifeworld alongside time, physical objectives and social relations. Everyday experiences are taking place in time and space, and space is such related to meaning, routines, and knowledge. Thus, the concept of lifeworld requires a relational understanding of space: the spatial order shapes the individual life worlds, but at the same time space is constituted in the mind and the practices of individuals.

The approach of SRA seeks to shape spatial conditions according to the expressed need of heterogeneous individuals in local settings. According to the lifeworld orientation social spaces are thought of in two ways:

- the individual and subjective needs, which have to be identified and made transparent; every individual has its own living space. The overlapping individual spaces constitute collective interests, problems and practices and, thus, social spaces.
at the same time an administrative space (e.g. a municipality, a district, a neighbourhood) can be understood as a tool for political governance. Therefore, local services have to be developed in a way that they offer flexibility, and are interconnected.

According to Hinte the SRA approach (Hinte 2006) is based on five principles:

- the will and interest of the individual as the starting point;
- the preference for activating work over caring activities;
- for the design of social services, personal and socio-spatial resources are crucial;
- activities are oriented to target groups and cross-sectorial integrated;
- cooperation and integration of social services as the basis for effective individual aid.

SRA proclaims that schools are focal institutions in many ways. In the field of child and youth work, schools have to be seen also as spaces of social work. This is particularly important in Germany that has a tradition of institutions and consequently also spatial separation of educational systems and social work. Thus, centring on the perception and practices of individuals SRA calls for a better integration in the institutional environments. The shift from part time to all-day schooling means that the key role of schools for the life of children and youth becomes even more significant

From the perspective of local policies and the growing concern for an active society, the role of schools as focal points for civic engagement is receiving growing recognition. This is of particular importance for rural communities, in which the institutional landscape is less diversified (Arbeitsgemeinschaft der Akademien Ländlicher Raum in den deutschen Ländern 2010; Dieminger, Benno and Wiezorek, Christine 2013; Fücker, Otto, and Leyda 2015)

From the perspective of schools SRA contributes to the development of external relations and the embeddedness of schools in a wider social context. Although, schools are the central institutions in which the learning process of children and the youth is organised, SRA highlights the importance of formal and informal non-school settings for learning processes and forms of informal learning, which are equally important both for the socialisation process as well as the school success (Deinet 2010). SRA seeks to broaden the perspective from school-centred understanding of learning towards a broader approach of Bildungslandschaften (education landscapes).

Due to its origin in social work rather than education, SRA is most commonly applied in urban planning scenarios for public spaces and the development of education oriented utilisation concepts of different types of urban areas such as housing areas, green areas, pedestrian zones, infrastructure for youth, central places but also fallow land.
3.4 Virtual Spaces

In recent decades, virtual Spaces have attracted a great amount of interest in educational policy and research. Subsequently, there is a huge amount of literature that cannot be comprehensively covered in such a review. Therefore, in this section only a couple of main debates are highlighted. The next subsection will address the concept of Personal Learning Environments (PLA). In this perspective earning is conceptualised as an individual undertaking and the teacher-learner relationship is central. The second subsection outlines the idea of learning communities or communities of practice. According to this view learning is social rather individual process. It is apparent that this approach provides different answers to the design of virtual spaces than PLA approaches. A third subsection will briefly address social inclusion. In the final section a set of quality criteria, taken from the D-ELINA award (German e-Learning innovation and young developer award), will be listed.

3.4.1 Personal Learning Environments

Most of the e-learning literature in one way or another addresses the development of Personal Learning Environments. In an extensive literature review Fiedler & Väljataga (2013) have identified two major strands in the ways how PLEs are conceptualised. The authors suggest that the dominant strand “almost exclusively addressed issues of digital instrumentation and re-instrumentation of learning activity in predominantly formal educational contexts” (ibid, 3). In this view, Personal Learning Environments are basically portrayed as “concrete technical systems or tool collections” (ibid, 3). The authors within this strand of research and development discuss these issues in relation to the existing state of the Web as the leading medium of our times in general, and to personalisation, selection, modification and adaptation of tools and interfaces by (potential) users in particular. The main problem is seen in a perceived gap between the digital instruments provided by schools, that fail to adapt to the “Web 2.0 attitude”, and students demanding the use of these new technologies. The pretext of much academic work in the field is that technology is set inevitably to change educational contexts for the better. Thus, the main task of educational technology analysts is to identify the impediments and deficiencies that are delaying and opposing the march of technological progress (Fiedler, Sebastian H.D: and Väljataga, Terje 2013, 8; Selwyn 2010).

The authors argue that with regard to the teacher-learner relationship the “concern doesn’t seem to be whether PLEs should remain the sole domain of the learner or in what way an institutional personal learning environment remains personal, but rather how to keep control over students and their environments” (ibid, 6). The guiding idea seems to be supporting and extending the established activity system of teaching and studying in formal higher education with new digital tools.
A second strand of research is concerned with how individuals or collectives could gain control over significant elements of their overall learning activity and its instrumentation. Here, apparently, Personal Learning Environments is conceptualised as an approach to the development and maintenance of environments for/ of personal learning. In another literature review ((Buchem, Attwell, and Torres 2011)), that comes to similar conclusions, this strand is described as pedagogical view in opposition to the dominant technical view. In fact, the authors come to the conclusion that “the core concepts such as ownership, control, literacy, autonomy or empowerment are often mentioned but seldom defined, theoretically grounded or differentiated” (ibid, 30). Moreover, “focusing on the three aspects - personal, learning and environment - means disregarding other key elements of the activity system, i.e. rules, community and division of labour” (Buchem, Attwell, and Torres 2011; Buchem, Tur, and Hölterhof 2015).

### 3.4.2 Learning Communities / Communities of Practice

Social constructivists highlight two aspects of social context that largely affect the nature and extent of the learning. For example, learners are members of a particular culture. Thus, they learn throughout their life’s culture specific symbol systems, such as language, or signs. Subsequently, social constructivists view learning as a social process. It does not take place only within an individual, nor is it a passive development of behaviours that are shaped by external forces. Meaningful learning occurs when individuals are engaged in social activities. Without the social interaction with more knowledgeable persons, it is impossible to acquire social meaning of important symbol systems and learn how to use them. In practice, e-learning is always in peril of presenting de-contextualised multimedia content and ignoring the learning object relevant participatory and practical context (Arnold 2007).

In this context the concept of “communities of practice” (CoP) (Wenger 1998) has found wide recognition. CoP are seen as a “kind of community created over time by the sustained pursuit of a shared enterprise” (ibid., 45). Learning is seen as much as a social process of becoming a member of a community (learning as belonging), of creating an identity (learning as becoming), of creating meaning (learning as experience), as it is a cognitive process of knowing facts or acquiring practical skills.

The concept of Communities of Practice has found recognition with regard to e-learning in two ways. Firstly, and more dominantly, it has facilitated a debate on virtual communities. Virtual communities are particularly interesting in situations when communities of practice are difficult to create, for instance, when the number of possible participants in a location is too small. Here, the community (or network) of learners is considered to be a community of practice that shares the practice of learning, even if they do not form a community of practice through collaboration in everyday context (Gannon-Leary and Fontainha 2010). Secondly, e-learning, like
any other learning arrangement, has to be situated in the context of social and cultural practices (the communities of practice), in which learners are engaged in (Arnold 2007). In this sense, e-learning, in particular the application of Web 2.0, is considered to be a way to enhance and improve already existing learning activities in real world CoPs. For both views general rules have to been drawn, such as:

- Sense of purpose: a (virtual) CoP must have a purpose and it must be achievable
- Time and space for communication among participants
- Open and active forms of participation
- Uncovering individual contexts
- Integration of practical expertise
- Close linkage between learning content and practical application

However, it is noteworthy that not only students, but also teachers form communities of practices that can be supported with collaborative ICT-Tools (Cochrane et al. 2013).

### 3.4.3 Inclusion and Integration vs Separation

There is a widespread assumption that the socialising function of media and media competences are generation wide phenomena. Thus, the current youth is often characterised as “Net-Generation” or “Digital Natives” (Prensky 2001). Such characterisations suggest that the current generation, which is grown up with digital technologies, particularly the Internet, and, thus, is more confident to explore the possibilities offered by the new technologies and also uses ICT more intensively. However, this hypothesis must be taken with care.

A closer look reveals that media competences and ICT usage by differ widely between students of the same age (Buchem 2013). The DIVISI U25 study has revealed that both media competences as well as ICT usage patterns vary with regard to social milieus, and according to formal educational degrees (SINUS and DIVISI 2014). Moreover, the study „D21-Digital-Index“ revealed great regional variations of ICT access, usage and media competences. Even within generations we find large variations, particular between women and men, people with different educational backgrounds, and also between cultural groups.

The focus of the European digital literacy debate is still very quantitative in nature, addressing the time spend and counting various forms of usage of technologies. A more qualitative approach is the concept of information literacy as the American Association of College and Research Libraries have named it. According to this the “information literate” individual is able to:

- Determine the extent of information needed,
Access the needed information effectively and efficiently,
Evaluate information and its sources critically,
Incorporate selected information into one’s knowledge base,
Use information effectively to accomplish a specific purpose,
Understand the economic, legal, and social issues surrounding the use of information, and access and use information ethically and legally” (The Association of College and Research Libraries 2000).

Information literacy requires digital literacy, but goes far further. New ICT offer access to a vast amount of information. The user is more and more forced to define their informational needs and to select required information. However, various studies show that users often know how to use ICT for private purposes, but lack the capabilities to critically and efficiently assess and select information (Heinze and Schnurr 2009). This is also true for the young “network generation”. Thus, the schools have to focus on media competences.

3.4.4 Quality Criteria

In the context of this report it is noteworthy to look-out for Quality Criteria for e-learning and the construction of virtual learning spaces. The following uncommented list of criteria are the assessment criteria of the D-ELINA award a German e-Learning innovation and young developer award (D-ELINEA 2015, Orig. German, translation by the author)

1. **Sophisticated application of innovative future technologies and media.** Integration of Web 2.0 tools such as blogs, wikis, podcasting, twitter or rss-Feeds etc. in learning environments, simulation and game-based applications, implementation of virtual realities, 3-D Simulations, ambient technologies. Consideration of media didactic aspects.

2. **Integration into schools and classes/ organisations and businesses/knowledge management structures.** Compliance with curricula (at schools)/ Integration of concepts and products; prototypes at institutions of higher education and in businesses. Exemplary connection of knowledge management and e-Learning or new ways of merging work and learning (workplace training).

3. **Originality of concepts.** Own (further) developments of products, applications or concepts with a visible own contribution.

4. **Facilitation of informal processes.** Integration of collaborative forms of learning, creation of learning groups/communities; integration and support of active role learners.

5. **Approach to and motivation of learners (User-Marketing).** Approach to target groups, integration and motivation of learners, e.g. by easy and self-explaining techniques and tools. Consideration of media didactic aspects.
6. **New methods and processes for the development of learning content/content sharing.** Successful concepts and solutions for the multiple use of content, optimisation of process management and the development of adequate tools.

7. **Potential for transfer.** Transferability of concepts/products to other organisations/user groups.

8. **Efficiency.** Feasibility in the context of given budgets, potentials to attract funds (schools)/Benefits vs. development, implementation and maintenance costs, potentials for cost reduction in face of existing/traditional learning concepts, potentials for further development and marketing of product/service.

3.5 **Architecture**

3.5.1 **Perception of Architecture**

It seems that school architecture is covered rarely outside of the professional circles of construction engineers and architects. In Germany, we find comparatively little social research on school architectures addressing the perceptions of the clients such as students and parents.

The most prominent researcher addressing school architectures in Germany in recent years is Christian Rittelmeyer (Rittelmeyer 2004; Rittelmeyer 2008). He has developed a comprehensive - “anthropological” approach to analyse students perceptions of school buildings and the effect of school architectures on students. Methodologically, such an anthropological approach is going beyond socio-psychological studies that measures verbally expressed attitudes and assessments. Studies also include the study of body reactions. For instance, pictures of school buildings are presented and eye-activities are measured, which are the elements of a building that are perceived and that attract attention. In such a perspective “viewing” is not just a passive perception of a visual object, but an activity in which several senses (visual perception but also the bodily sense of balance or the sense of proper motion (?)) are combined (a “synaesthesis of senses”). Thus, perceptions and judgements on architecture are, on the one hand, formed through the interplay of multiple senses - particularly the interplay of visual perception and the sensomotor system.

On the other hand students interpret school buildings in terms of a social relationship as partners or communicative gestures. The social aspect or the basic social principles reflect the perception of school buildings as social relationships. Commonly expressed expectations of students are:

- variety (Abwechslungsreich) vs monotone
- open /(freigelassen) vs. thronged (bedrängte)
The first, and probably the most commonly addressed criteria is the variation and stimulation criteria. Monotone facades and interiors should be avoided. Instead, varying textures and well-placed colours and decors, different room layouts (Raumformen) and a “breathing” orientation of corridors are required. However, variation should not end up being chaotic nor importunate (e.g. through the use of screaming colours or an extreme style of roof. This would violate the openness criteria. Forms and colours should be open and appear besetting or limiting. On the other hand, too large openings and windows, extensive halls or transparent inks may violate the criteria of warmth/softness.

A fourth criteria covers the functional-technical aspects. This includes the choice of materials, technical applications, ergonomics, lights, room climate etc. There is an abundant available literature on these aspects (see also the contribution of Sismey to this report). Functional-technical aspects differ to varying purposes of rooms, corridors and other spaces. Thus, a simple way to meet the variation criteria is to vary room designs according to the varying room dedication (Raumwidmung). Further, students may accept occasional deviations from the general principles, if they are functionally appropriate. For instance, a cold and monotone design is generally accepted in a science laboratory.

With regard to young pupils (up to the age of 12) further aspects have to be taken into consideration. In primary schools the aspects of freedom is at the same time connected with the desire for safety and protection. Moreover, when children are asked to describe or draw their desired school they generally express a desire for nature that is green spaces (greens, bushes, plants and trees). Another typical theme is clarity of structures and the desire for orientation. Large buildings are rejected, while clearly structured buildings or even schools that are separated in several smaller houses are preferred.

Further criteria are the regional aspect, the fit into context and the reference to local architecture, and the historical aspect. A generally addressed requirement is that (new) school buildings have to be - beyond a superficial fashion - timely (zeitgemäß), but at the same time must fit into regional context. The regional and the historical aspects are closely related with the aesthetic aspect. School buildings may be perceived as being beautiful or ugly. Aesthetics are social constructions, which are rather independent from functional considerations, and may vary greatly across time and space.

### 3.5.2 Building Schools

In Germany, building schools is treated as a rather technical issue, while the linkage between pedagogical concepts and architecture remains comparatively weak. The guidelines published
by the Kultusministerkonferenz (KMK) in 2010 list the following topics (Kultusministerkonferenz 2010):

- Accident protection, safety and health
- Fire protection
- Sound isolation and Acoustics
- Heat protection/isolation
- Heating systems
- Air conditioning
- Electrical Installations
- Gas, Water, Sewage and Sanitary Installations
- Lightning
- Sport facilities and playground
- Barrier-free designing
- Equipment and furniture
- Costs, Room sizes and volumes.

The document contains an extensive list of DIN-Norms and legal standards to be considered. The list of standards and regulations provide very detailed construction information and guidelines for construction engineers. Pedagogical considerations for spatial arrangements, the (participatory) planning process, the placing of schools in social environment, aesthetics and even the ICT infrastructure not or only in a general way – mentioned.

It is only recently that the link of architectural design and pedagogy has attracted more attention. As a result of a consultation process among architects, academics, teacher and politicians, the Montag Foundation published Guidelines for effective school-buildings (Montag Stiftung Urbane Räume gAG et al. 2014), in which a set of basic principles has been defined such as:

- a pedagogical architectonic concept as the basic vision for the school architecture.
- Straightforwardness of the design, which gives students orientation, carefully selected and designed materials, lightning and colours. Well designed schools express appreciation of schools, students and learning.
- Multi-functionality and flexibility with regard of both short-term/situative adaptation and long-term changes.
- Sustainability both economically as well as with regard to the physical building.
- Health and safety.
- Integration into the community.
4 Review of International Literature

4.1 Introduction

In reviewing the relevant background literature (other than that which relates directly to Germany or areas of Germany in the South Baltic) in relation to social space and student competencies, it is evident that there are a significant number of innovative educational initiatives that can be found all over the globe. Generally it is well known and unsurprising that those environments which are light, quiet, warm, safe, clean and comfortable play an important role in successful teaching and learning however, where this is not the case the success of teaching and learning will be reduced and can be negatively impacted. There is nevertheless, an increasing body of research whose purpose is to address the issues and details that lie behind this. Nevertheless, although some of it is undoubtedly valuable some of it is also less valuable while yet some is somewhat inconclusive. The background broad literature review seeks to look into the existing evidence to see if/how this can assist schools in fashioning and developing appropriate learning environments not only for current educational needs but also for those of the future too. The review also attempts to assess learning environment impacts on the achievement and abilities of pupils as well as their engagement in the classroom and their well-being. The literature that was specifically reviewed is mainly sourced in the UK though some of the content refers to examples wider than the UK.

The analysis itself draws the following conclusions:

- It is somewhat challenging to come to fixed conclusions concerning the impact of learning environments. This is because of the multi-faceted nature of learning environments as well as the assorted and unrelated nature of the research literature.
- What has been researched by others as regards the impacts of the environment on teaching and learning mainly focuses on just some components and there is thus an absence of combining multiple considerations.
- There is unequivocal evidence which indicates that excessive environmental elements (such as restricted classrooms or poor lighting) have a detrimental effect on the learning environment and that where this is improved then a positive payback will naturally follow. However, where learning environments reach the minimum standards there is less information about the effect of this.
- Changing a learning environment is a worthwhile investment where it is undertaken as part of a design process. The underlying chain that connects environmental change and changes in pupil attitude, behaviour, abilities and achievements are relatively complex.
Upon reviewing the background literature it became evident that some areas have been researched more than other areas and thus, there can be much more to say about issues relating to the environment and the effect on the learning of pupils, than about products and services.

4.2 Social Spaces and Student Competences Defined

Social spaces and student competences are here defined as being any space where learners are able to communicate with others who, collectively, have a common goal of learning. This may, for example, include schools, classrooms in those schools, online social network sites and many others such “spaces”. The way in which social spaces of learning are created and managed are essentially based on whatever the dominant theories of learning are under discussion at any given point in time or whatever might be being driven at a political level, as well as the social, cultural and technological context. Indeed, each component is most likely to have a direct effect on the others. Cousin (2005) points out that ‘technologies work dynamically with pedagogies…and in the process they become mutually determining’.

Leander et al. (2010) posit that the process of learning is not only something that relates to that of the mind but is also something which is “distributed across people, tools and learning environments”. Clearly, learning environments and thus social spaces do change over time and the impact of this is the resultant changes to the learning processes and further, the way in which learning is supported and provided. Educational organisations and educators who play a key role in the support of learning need to appreciate what these social spaces are and the effect and impact on learning. What is also clear is that because space, connectivity and movement are undergoing constant change there is an ever increasing pressure for pupils, students and learning to be life-long learners not only in a formal way but also in informal ways too.

As regards social space, Leander et al. (2010) see that the classroom is viewed as the key learning social space, certainly on a traditional basis, and names this as the “classroom-as-container”. As the central place for learning, this is where the teacher teaches and the students learn from what the teacher teaches. Effectively, the teacher gives out or “transmits” knowledge while related materials are at the centre of the experience though there is minimal connection between “in-class” and “out-of-class” learning. However, some, such as Lefebvre are now challenging this fixed and more traditional view(Lefebvre 1991). Those like him see space not simply as a “solid but as a complex of mobilities, a nexus of in and out conduits”. Leander et al. (2010) further define space not simply as “an isolated container” but as being situated “in a nexus of relations to other such locales”. Thus, there is a clear link between a school and the school play area as well as the way pupils go home and to the other parts of
the surrounding community that the traffic flow of students that goes to and from the school – the social spaces that are linked with the place of learning in some way, be it a school itself or other place where students are educated. Castells also points away from the more traditional view of “space as place” to the notion of space being “flows” (“Space of flows”). In this construct space is defined as being the place where practices happen together and/or at the same time and therefore they do not require to be dependent on “Physical proximity”. This is mostly likely influenced by the massive growth of information technology where the (ebb and) flows of information and thinking are facilitated somewhat by digital technologies. Moreover, Lean- der et al. (2010) suggest that these social spaces are not only defined by “on-going movement” but also by our own “intentions and actions”. For example, a “mobile phone can be a place to store photos” as well as a space that can be occupied to simply surf the internet to make a phone call. Another example would be where German students would requisition a part of the sports ground to sell snacks to other students but which at other times it is used, in contrast, for students to practice speaking Spanish in a kind of Spanish practice group after official school time as an extra-curricular activity. Such usage supports a view that a “regular flow of movement and activity” in this space effectively becomes a “social learning space”. Massey takes the definition a step further by indicating that social spaces can also include “a notion of time” whereby the social space is affected by history in terms of “simultaneity of stories so far”. As well as this concept of learning spaces other innovations have been taking place in classrooms such as the use and availability of IT including not only laptops but tablets and other such devices, as well as Interactive White Boards with projectors. Thus these physical social spaces have been complemented, over the last decade, by virtual spaces and places.

4.2.1 Schools as Local Community Institution

An agreed definition of schools as community hubs within the literature that was reviewed has not been reached. However, the idea of schools being an integral part of communities as community hubs has been defined in a variety of ways though the following definition by Black (2008) is drawn on for its comprehensiveness as to how a school as a community hub might most likely be perceived:

A “collaboration between school education systems and the other sectors (community, business, local government and philanthropy) to support the learning and wellbeing of young people, especially those facing disadvantage” (p. 6). These collaborations can range from sharing, co-locating or joint use of physical facilities, through to schools as the centre of a hub or precinct that offers multiple services for the whole community.”
Black, Lemon & Walsh (2010) established that a variety of forms of school-community partnerships have been implemented for various purposes and these operate internationally and are outlined below:

- **Schools as community hubs**: the provision of a range of social services either in a school or in collaboration with a school. In this format the hub hosts services that provide access to necessary support and services and which are readily available to all, with a focus on disadvantaged children in addition to children who are identified as being at risk.

- **Schools as community learning centres**: Such (school) learning centres aim not only to establish connections and links with educational institutions but also with social support functions. The centre would typically be open to anybody in the (local) community, not only children and their families, and offer possibilities to enter into further learning opportunities.

- **Schools as centres for learning excellence**: Schools as centres are effectively a conduit for the provision of support systems and services with the aim of being fixed on high performance. Such a collaborative provision of supplementary services augments educational participation though, as opposed to the community hubs model, this instead focuses on all pupil and not only the disadvantaged and those defined as being “at-risk”.

- **Early childhood schools model**: are regional hubs which offer integrated services for children from birth through to 8/9 years of age together with their families. The services that are provided typically include child care facilities, targeted and miscellaneous family support services as well as other tailored services which support the learning, health and well-being of children.

- **Extended service school model**: the extended service school model is defined as a “work in partnership with Government, local providers, community members and each other to offer a range of extended services to students, their families and the local community.” They are a model for engaging students, parents and the community to complement that which is already experienced inside the classroom. In the UK such a model is otherwise known as the “Full Service Extended Schools Programme and started from 2003/04 for the benefit of children and families as well as the wider community. The services that the Programme provides focus on disadvantaged children which seek to help them realise their full potential by means of a one stop shop where, for example, adult education, health services and various community activities are offered. The idea behind the extended schools concept is “founded on the recognition that schooling, for any, can only be approached once a range of welfare and health services are in place” (Wilkin et al. 2003, 9). The creation of collaborations, networks, joint approaches, networks etc are at the heart of this model with the school being the central point where the onus is for building and integrating such relationships and connections.
A full-service community school: is an American partnership approach which concentrates on partnerships between the school and its community. Community schools are “those that have been intentionally transformed into neighbourhood hubs and that are open all the time to children and their families. In these buildings, a range of support services is provided by community agencies to help overcome the many barriers that schools face in producing successful students” ((Dryfoos 2005). According to Dryfoos these schools are different because they function on the basis of partnership agreements between community agencies and public schools and community agencies.

4.2.2 Increasing Entrepreneurship and Development of Students

In the UK Her Majesty’s Treasury declared that ‘building a successful enterprise/entrepreneurial economy starts with children in schools’ thus making Enterprise Education more relevant than ever before (HM Treasury 2008, 38)). The British Government subsequently published an ‘Evaluation of Enterprise Education in England’ in July 2010 where McLarty et al. (2010) in evaluating Enterprise Education in England, describe both the range of enterprise education provision and its outcomes.

The report indicates that Enterprise Education seeks to ‘help young people be creative and innovative, to take risks and manage them, and do this with determination and drive’ ((McLarty, Highley, and Alderson 2010, 12). McLarty points out that where enterprise education has been included as part of the curriculum it is seen as having a positive impact on the employability of pupils as well as in terms of teaching and equipping pupils with enterprise skills, self-awareness and business and economic understanding.

The challenge however, is to embed enterprise and here McLarty recommends that “Enterprise activities should include whole school projects which can be pupil-led, thus providing peer-to-peer learning - Employer Engagement - Partnership and Networking with other education providers, businesses and the community.”

Moreover, it has been established that of those schools that had Enterprise/Entrepreneurial education included within the curriculum there was a positive connection with higher levels of staff motivation as well as “improved teacher understanding of Enterprise Education as a teaching and learning style”.

McLarty identifies several Critical Success Factors namely:

- Support of the Senior Management Team
- Enterprise Co-ordinator
- Time in the timetable
- High priority within the curriculum
- Time and resources for employer engagement
- Combination of external provision and embedded in the curriculum
- Enterprising ways of teaching (e.g. learning by doing)
- CPD for teaching staff
- Measurement of the impact of activity
- Reviewing sustainability

Furthermore, schools that include this within their curriculum comment that ‘an enterprising way of teaching and learning naturally emerges’ and after time “schools demonstrating good practice in enterprise state that their school has developed a culture of enterprise (McLarty 2010).”

Seen as embellishing the research McLarty’s, Draycott and Rae (2011) examine what ‘enterprise’ equates to in the context of 14-19 education. They consider the term ‘enterprise competency’ and “how this can be made into assessable curricula for implementation in schools”. Caird (1992) however, classifies the range of ‘enterprise’ skills into seven broad skills:

- personality variables
- communication skills
- managerial skills
- analytical skills
- career skills
- knowledge and attitudes.

However, it is argued by Draycott that this classification “lacks specificity and rationale for the concept of enterprise competency”. Moreover, the Institute for Public Policy Research (IPRR) in ‘The Entrepreneurial Society’ suggests a need for the introduction of enterprise and entrepreneurial skills in schools and supporting a practical approach to develop the business and soft skills of young people (Gavron et al. 1998).

These relate to practical “business experience, team working, problem solving and negotiation, communication, enterprise skills and planning and presenting”. Draycott also questions whether “enterprise is best taught or learned.” ‘How effective is a curricular, teaching-led approach in comparison with an enterprising approach to learning through exploration and discovering learning in conditions of controlled risk and uncertainty’ (Draycott and Rae 2011, 4). Moreover, Draycott opines that that the “most influential enterprise educators work with flexibility and freedom thus enabling students to learn through guiding the process”. Consequently, educators themselves take every measure to “ensure that the outcome is not too heavily prescribed. Students not only develop skills but also flexibility and so are able to adapt to change.”
In the UK the Office for Standards in Education, Children’s Services and Skills (Ofsted) (a non-ministerial department of the UK government) submitted its own ideas on the issue in 2004 in its publication ‘Learning to be enterprising – an evaluation of enterprise learning at key stage 4’. The main findings indicate that schools “making the most effective provision must have strong commitment from the Senior Management team supported by an enterprise ethos coupled with local business and community support”. By having clear aims and objectives pupils take responsibility for their own actions and can become autonomous learners. On the other hand those schools which were least effective “failed to recognise that enterprise had key implication for teaching and learning styles”. Thus the key issues are around the need for a clear definition of enterprise learning which needs to understood and signed up to by staff and students alike, as well as other stakeholders.

Jones et al (Jones and Iredale 2010) see that learning outcomes which are focused on “knowledge, skills and attributes” not only need to be set up but need also to be measurable and thus the required monitoring and evaluation of enterprise and entrepreneurship learning and be critically linked to its sustainability and success within the learning environment and curriculum generally.

Jones goes on to explore enterprise education as pedagogy and mulls the question of whether “enterprising qualities” are a critical requirement to address the stresses that are a result of the evident “rapid changes in society” and therefore schools should view their inclusion as being of vitally important (Jones 2010:10).

As regards the specific training of entrepreneurial skillsets in the UK, in June 2014 it was reported in mainstream press in the UK that children of a primary school age would be taught “how to be entrepreneurial” as plans by the government were revealed that children from 5 up to secondary school age would receive teaching about the benefits of having their own business and how to make profits (Delmar-Morgan 2014). This motivation is further to a report by Lord Young – “Enterprise for All” which stresses the importance of educating young people about entrepreneurism with a long term view of making future business more competitive and to promote self-employment as well as the setting up of own companies (Young 2014).

The Wall street journal reported in April 2014 on how children as young as 8 are being taught about entrepreneurship (Wells 2014). On the back of billion dollar profit start-ups such as WhatsApp and Oculus VR Inc, the Journal reported that “younger children are filling classes, camps and other programs that promise to develop entrepreneurial skills in the pre-pubescent set.” The article goes on to comment that some scholars support the need to nurture the entrepreneurial spirit in children because they are “born imaginative, energetic and willing to take risks” though this often is lost as time passes by. Moreover, offering entrepreneurial skills
classes to children is seen to “make up for gaps left by an educational system” that does not adequately prepare students for the rapidly increasing “tech-centric” and quickly moving job market that is available world-wide and not just locally.

4.3 Development of Life Skills and Competences

In 1994 the World Health Organisation published its report entitled “Life Skills Education for Children and Adolescents in Schools (Introduction and Guidelines to facilitate the Development and Implementation of Life Skills Programme)”. The report sees that in the light of the wide range of relevance of life skills in society generally, such skills need to be introduced early on to children and young people through the conduit of the learning places – schools. The report advocates life skills teaching being undertaken at a young age “before negative patterns of behaviour and interaction have become established”. Schools are thus seen as the best place for this to happen owing to the role that schools naturally have with the socialisation of children and young people. Moreover, schools have a large scale captive audience as well as being able to use already existing infrastructure and teachers. According to the Global Monitoring Report “Youth and Skills: Putting Education to Work” there is a link between the teaching of life skills and minimising the risks associated with STDs. UNICEF strongly advocates implementing life based education for young people through a variety of models from the formal method - primary or secondary school curriculum which is focused on the teacher through to an extra-curricular programme affiliated with schools where schools are a conduit for reaching children with the programme. In the UK OFSTED has indicated that it sees that a life skills programme can be most effective when they include some specific lessons with separate curriculum time. Thus some UK schools teach life skills by identifying appropriate objectives for each key stage and carrying out this teaching through other subjects as well as through whole school events etc (http://www.nthfdman.bham.sch.uk/life-skills/). In Australia, resources are provided to support primary schools in a “Whole School Approach to Promoting a Career Development Culture). Here the idea is “to provide teachers with a conceptual framework, sample activities, and supporting materials to help facilitate classroom learning associated with their students’ personal development, career development and life-long learning skills.” (see Primary School Life-Long Learning Skills)

Schools then are seen as being imperative in and central to the delivery of the teaching of life skills to children and young people for a variety of reasons – not only in terms of later career development and in the workplace but also for childhood as well as in raising health awareness.
4.4 Architectural Space

Other than specific studies such as, for example, 21st Century Schools, there does not appear to be much evidence that concerns the issue of whether architecture ideas does, in fact, directly affect schools or not. Clearly many schools, if not a majority of them, would be located in older buildings and therefore they are thus unlikely to reflect current or modern design. Moreover, although the British government for example, permits the construction of more imaginative school buildings, it nevertheless seems likely that many of the new schools buildings that are being planned will simply follow the design of those which came before. Seaborne comments that despite there having been changes in school architecture over time, these have nevertheless been somewhat slower than has been necessary or desired (Seaborne 1971). In their book “The English School: Its architecture and organization: Vol. 2: 1870-1970, Routledge and Kegan Paul, 1977” Seaborne and Lowe reflect upon how the eagerness for ‘open plan’ primary schools was weakened and, as a result many newly built schools in the 1960s ‘are probably best regarded as “semi-open”’. (Seaborne and Lowe 1977, 177). Jameson et al (2000) comment that this reserved approach is most likely because of the lack of input in and participation of would be users in the design of the educational facilities.

A number of writers pick up on the notion that in considering and trying to affect the nature of the school environment there can in fact be an empowering effect as regards design and architectural ideas. For example, David (1975) maintains “that users are generally empowered by understanding and altering their environments”.

Some have noted and suggest that the involvement of users in the design process should actually have the effect of improving the design. Dudek ((2000) and Clark (2002) both recommend involving students and teachers in the design process as opposed to these groups simply being involved on a tokenistic basis. Interestingly, during a period of experimentation with open-plan education, a contemporary book by the IDEA (Institute for Development of Educational Activities) (IDEA 1970) suggested the involvement of all staff in order to understand the potential of the space. Furthermore, the book was unequivocally clear that ‘there must be extensive involvement of the parents in the planning as well as in the implementation of the programs; otherwise, the new school is doomed before it is even opened’. (p.20).

Rivlin and Wolfe (1985) advocate the involvement of children in bringing their ideas and visions to the table. An incident is described by them whereby a classroom innovation was deemed to be a failure because the pupils were not involved in its design (p. 200). Moreover, they regard the involvement of children in design projects as important in overcoming what is seen as adult conservatism. Several authors argue that, because non-professional and expert
views about architecture are different, it is therefore important to include the views of ordinary users (Asprino, Broadbent, and Powell 1981).

A great deal of subjective evidence has been collected although this has been done for a number of different reasons. Firstly, the opinions of teachers (Schapiro 2001) and children (Burke and Grosvenor 2003; Cohen and Trostle 1990). Some of this infers that the chief concerns of different school users of a school may in fact be entirely different (Fraser 1984; Maxwell 2000), though there are also sometimes the same issues that arise (Maxwell 2000; Douglas and Gifford 2001). Often the canvassing of (potential) users of schools has been a central part of the planning and improving of a school environment. In such a case Berry (2002) used this to both inform and assess the school improvement that he reports on.

4.4.1 The School Built Environment

There is general acceptance that the fundamental aspects of the physical environment, such as heating, lighting and acoustics, as well as the overall design of the school, need to be taken into consideration in terms of their respective effects of learning.

Many published reviews of the impacts of the physical school environment on the learning abilities take into consideration previous research. This is done in a similar way - they do, in fact, draw attention to the fact that “more definite conclusions within this area can be drawn about the effects of these underlying physical characteristics” (Schneider 2003). Nevertheless, it is should be remembered that all of the various features contribute to the educational environment and as well as the concerns about potential interactions there is also the issue that recommendations in relation to particular physical issues can actually be in conflict with one another.

Earthman ((2004) places temperature, heating and air quality as key amongst the most important individual features as regards student achievement. There are studies which refer to the importance of these issues in respect of the needs of particular US schools, though Fisher ((2001)) and Schneider (2002) likewise indicate that, similarly these factors are likely to affect student behaviours and educational performance.

4.4.2 Lighting

Lighting in a classroom features significantly in the literature and thus there is clearly an assumption that this has a direct impact on the teaching and learning environment. Amongst this there is research relating to the many different kinds of lighting that is employed including daylight and artificial light while there is some disagreement among those who have researched the issue on which form of lighting is the most suitable for the classroom. As regards student achievement some see that day lighting cannot be beaten for having the most positive
influence (Earthman 2004) simply because daylight produces positive biological effects on the human body.

Jago & Tanner (1999) posit that ‘the visual environment affects a learner’s ability to perceive visual stimuli and affects his/her mental attitude, and thus, performance.’ Knez (1995) established that lighting conditions that induced a negative effect reduced educational output and performance, while lighting conditions that encouraged a positive effect improved performance. However, in contrast, the work of Veitch should not be overlooked. He argues that lighting has no effect whatsoever on disposition or educational performance (Veitch 1997). Knez has also studied the link between lighting and gender and established that females were more sensitive to light than males. Knez further established that males and females performed differently in different kinds of lighting.

4.4.3 Other design issues

Amongst authors and researchers there are other design issues that need to be taken into consideration one of which has featured significantly over the last few decades, that of open-plan schools. Some (Gump 1987; David 1975) have taken a position that created environments require interpretation within the context of the interaction of social and physical elements rather than other physical factors. There are in fact other issues as regards design and layout arrangements within a school that are considered in literature though these have not been as comprehensively researched as the areas mentioned above.

In Ahrentzen & Evans (1984) it was concluded that higher ceilings in classrooms have the effect of bringing about reduced perceptions by both teachers and children of crowding and, interestingly, but a consistent finding was that the height of the classroom ceiling correlated somewhat with overall teacher satisfaction (and thus motivation) with the room. On the other hand however, it has also been found that, conversely, higher ceilings may though be the source of other problems. Ceiling height was found to have an effect on the co-operative behaviour of pre-school children where children were seen to have higher levels of cooperative behaviour in classrooms with lower ceilings (Read, Sugawara, and Brandt 1999). Ceilings height can also contribute to other problems for example, Earthman (2004) (suggests that the high ceilings predominantly found in older schools could in fact cancel out the advantages of better lighting and, furthermore, can cause acoustic problems through reverberation and echoes.

Among the four features of Tanner’s (Tanner 2000) findings, a school design assessment scale demonstrates a clear correlation with student performance and success, and which are thus described by Tanner as being ‘pathways’ and ‘positive outdoor spaces’. These “pathways” are the building and the educational establishment’s grounds which allow and enable “ease of movement”, which is likely to mean routes are logical, pleasing to use and with ample
space. In this regard it is clear that Tanner believes that there are most certainly profits to be made from nicely designed and well maintained external places as the finding themselves infer that such aspects may well assist in successful academic performance.

4.4.4 Classroom Physical Environment

The physical environment of the classroom is clearly a more than obvious aspect when considering the effects on learning and teaching environments. As referenced by Talton and Simpson (1987) they comment that ‘The classroom is the basic structural unit of our educational system’. However, others don’t see the classroom physical classroom environment as being necessarily so central. Moos, for example sees that there is, in fact, an external effect where what goes on in the classroom is impacted by school design as well as the “objectives adopted at the school level” Moos’ (1979). Moos sees that the learning model environment needs to include ‘school context’ as a contributory factor that affects the ‘classroom climate’ though Moos also comments that the classroom itself is a suitable place to undertake observations and assessments. It is not however a wholly unreasonable expectation for the classroom environs to have an effect on student behaviours, motivation and performance.

Maslow and Mintz (Maslow and Mintz 1956) found that participants in an unpleasing (defined as “ugly”) room made noticeably “less positive judgements about photos” than other participants who undertook exactly the same exercise in a pleasant (described as a “beautiful”) room. Sommer and Olsen (1980) reported that a college in the 1970s established that a renovated room which also included pleasing soft furnishings and which was designed to be more friendly and attractive eto anyone who used the room, appeared to stimulate student participation. In fact, they observed that the amount of student participation both in discussions and in asking questions during lectures and classes were ‘two or three times as high’ (op.cit, p.13) in comparison to similar classes that were carried out in more traditional rooms.

Nevertheless, it remains somewhat challenging to deduce from these observations of Sommer and Olsen to set-out the definitive requirements for a school classroom. In Rutter’s Fifteen Thousand Hours: Secondary schools and their effects on children, (Rutter 1979), a pupil conditions scale was defined which sought to quantify the working conditions of students where this was positively linked to their exam success (or otherwise). Heshong’s study (2003) indicated that teachers were reported to have desired “more space, a good location and quiet environment, and have lots of storage and water in the classroom”. Moreover, teachers also preferred to be able to teach in classrooms with windows and natural daylight as well as pleasing views, thought it should be added that these factors were not the highest priority for them.
4.5 Virtual Space and Technology

BBC news reported in 2013 that 43% of youngsters aged 5 to 15 owned a mobile phone, compared to 49% in 2012. The reason for this is because instead of using mobiles children are instead turning to use tablet computers. The report goes on to suggest that the statistics indicate that that “the next generation is getting tech savvy not long after getting out of nappies: 28% of infants between the ages of three and four now use a tablet computer at home.”

With this in mind, over the last decade or so ICT has continued to feature more and more prominently within the context of the learning and teaching environment. The predominant conclusion appears to be that the more that teachers use ICT in the classroom both by teachers and students/pupils, the more the latter can be better prepared for the workplace.

In Tanner’s building assessment scale one of the four key predictors of student performance was the availability of technology for teachers. Access to technology by both teachers and students in the classroom is increasingly being seen as a “powerful educational tool” and it is evident that the usage of technology in all forms has become the norm in all schools at all levels. Indeed, certainly in Western Europe, if schools did not have any access to technology, specifically computers, then this would be seen as something extremely negative, indeed a regressive step. However, in the face of this there is nevertheless, somewhat surprisingly, an argument by some that technology, especially computers, might actually be hampering student/pupil learning (Fuchs and Woessmann 2004). Zandvliet & Straker (2001) comment that computers ‘do not override the important sociocultural, psychological and physiological human factors related to teaching and learning’. Moreover, they have identified difficulties that are linked to using computers – issues that relate, for example, to lighting and individual workspaces and furthermore, they contend that computer classroom furniture that has ergonomics in mind is shown to have a positive impact on a learning environment and thus potentially learning behaviours and cooperation - which then flows through to outcomes, performance and achievement. In addition to this Higgins and Hall (2002) see that, as regards the location and positioning of IT equipment in learning environments, there are a number of pedagogical facts that need to be taken into consideration. Here the focus is on how IT is introduced within the classroom context, how it is included pedagogically and how it is “embedded” as a normal part of the classroom set-up and furniture. Here Higgins and Hall see that ICT needs to be properly managed or “owned” by the teacher. They draw a contrast between a previous era and perhaps different learning stages where ICT was seen as something special and perhaps unusual – where previously one computer located in the corner of the room was shared between the whole class and was used at specific times for specific things. The contrast is with modern times where ICT has become, in most modern schools, a normal part of the learning
environment – as normal as a seat and a desk – and is therefore simply a part of the normal “furniture”. At the heart of the modern learning environment is the interactive whiteboard where previously there was the institution of the blackboard.

The advent of the interactive whiteboard has been gradual and to some extent it is a relatively new concept for many but its impact is clearly seen as significant in the light of the investment in their introduction across the UK in the early 2000s – running up to just under £60 million. However, not everyone has embraced the perceived benefits that technology can potentially bring to the classroom and learning environments. Lee (2004) is of the view that “millions of pounds may have been wasted on interactive whiteboards because too little research was carried out into their effects on teaching and learning”. This is supported by problems experienced in classrooms such as Interactive whiteboards not functioning and, in the absence of a conventional whiteboard, there was no possibility to write things on the board. In one case Lee refers to a case where whiteboards were installed at both ends of the classroom “making it impossible to see both”. Lee’s contention is that technology requires careful consideration as to the integration and embedding approach as opposed to simply spending thousands, if not millions of pounds, on investment and believing that large sums of money must somehow equate to a good investment in the learning and teaching environment. On this aspect Lee states “We are looking at a significant investment without much return. People should be able to choose the technology they want”.

In tandem with this speedy development in the use of personal computers and the Internet at home, at work and in education and the age of the internet, technology itself has been the diverse use of virtual space.

The list of such uses appear to be in exhaustive and crosses every imaginable area such as education, entertainment and business to name but a few. Facebook has 1.35 billion users as at December 2014 according to adweek.com (Bennett 2004) while Gamespot.com reported early in 2014 that there were over 100 million registered users of Minecraft. Gartner (2007) estimated that “80 of active internet users” would “have a ‘Second Life’ in the virtual world by the end of 2011. Whether this was realised or not is another discussion nevertheless, the figures under consideration are astounding as regards virtual space usage.

With regard to virtual space in a business context, this is primarily considered in conjunction with advertising and selling but also with carrying out market research (2008). But in the business world it is not limited to simply these areas – virtual space usage is broad and diverse and is used for all aspects of commerce from the displaying of historical artefacts (D. Koller 2009) through to the carrying out of virtual training and meetings that span the world.
Unsurprisingly, as has been outlined above, there has been something of an increase in the usage of virtual space in the education sphere too. Virtual space can be traced back as a learning support tool to the 1980s (Kern, Ware, and Warschauer 2008) Since then, it has been an increasingly commonplace aspect that has become integrated within education organisations and in learning environments from nursery schools and kindergartens through to colleges, universities and other learning places for further education (Dalgarne and Lee 2010)

There are numerable advantages of using virtual space within an education context. This is a view strongly espoused by the BBC:

“In the last 10 years, education has benefited from a real e-revolution - most schools and universities now have a functioning Virtual Learning Environment (VLE), at the heart of their teaching and e-learning programmes – a virtual 'shadow', if you will. A VLE, or learning platform, is an online system that allows teachers to share educational materials with their pupils via the web. Examples include Moodle, WebCT and Blackboard. For a student to be able to access a ‘Virtual’ room as either a duplicate or extension of their physical classroom is a clear advantage for learners and teachers alike. Every educational establishment ought to integrate a VLE into their lessons and allow it to become second nature to learners and educators outside of the classroom" (BBC Active 2010)

Here the view is that a VLE is not optional nor a “bolt-on” but rather is an integrated tool that becomes second nature/natural to learners as well as the educators. The benefits that the BBC see are mainly communicational and practical ones with clear links to improved education. So, for example, communicative advantages include the opportunity to access different channels of communication such as polls and threads with immediate feedback on issues. Practical advantages would include, for example, distance learning and being able to “hand-in” completed documents, reports etc remotely through “time-in” windows. Virtual learning spaces also have further benefits for learners and teachers through use of resources such as hubs, online libraries, interactive learning sessions and podcasts and videos.

Minocha and Reeves (2010) point to a further advantage of the harnessing of virtual space in education - that of not being restricted to normal limits that is offered by the “high degree of customizability offered by some virtual spaces such as Second Life — the most widely used three-dimensional virtual space in an educational context”.

The flexibility offered through virtual spaces thus enables an educator the opportunity to “customise a learning space to fit a specific learning activity or a certain pedagogical approach” (Minocha and Reeves 2010). Deutschmann and Panichi, (2009) point out that because there are little, if any rules in a virtual environment while the laws of physics can be ignored, virtual learning spaces can therefore be “used to visualize macroscopic and microscopic complex systems, manipulate time in a sequence of events, simulate scenarios, allow complex interactions, and create objects and content.”
As mentioned above, there appears to have been no limits as to how virtual learning has been used nor to how it will continue to grow in the future in an educational context. Virtual learning spaces are being used in a variety of educational contexts including music (Weller 2007), medical and health (Johnson and Levine 2008) and language learning to name but a few (Deutschmann and Panichi, 2009).

Nevertheless, despite this seemingly solid support for all things VLE Kling (Kling 1994) "Reading "all about" computerization: How genre conventions shape non-fiction social analysis," The Information Society, volume 10, number 3), cautions against extreme views of technology, either positive or negative, and suggest that more socially realistic analyses are needed. Moreover, several authors also “caution against an uncritical juxtaposition of technology and pedagogy in the domain of education” (Colpaert 2006; Felix 2003).

Nevertheless, the majority of scholars who have considered this issue have essentially made positive noises about the integration of new technologies in educational practice, both from an educator and learner perspective.
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