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The use of Interactive Whiteboards in English lessons at Czech schools

Master’s Diploma Thesis

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I declare that I have worked on this thesis independently, using only the primary and secondary sources listed in the bibliography.

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Author’s signature
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1 Introduction

The thesis revolves around the area of information and communication technology (ICT) in education. It is concerned with particular equipment known as an interactive whiteboard (IWB), with which gradually more and more schools are being equipped, and which has turned out to be a hot issue pretty much debated by many university professors and teachers from around the world. The reason of such choice was determined by the fact that school equipment has been changing over years, which inevitably goes hand in hand with new requirements being laid down for teachers. Undoubtedly, any changes which are brought about in education often lead to a whole range of questions called for to be answered. Within the field of education, all participants at school and teaching and learning processes are directly affected by new innovations. So it comes as no surprise that recurrent themes about an IWB already addressed by several authors deal with teachers and learners’ beliefs, changes in interactive patterns among/between participants, the impact on the way of teaching and learning, teachers’ preparations of lessons, willingness to use an IWB, money issues etc. Most of the themes are of a great interest of the paper, which attempts to find out what are teachers and learners’ opinions on an IWB, and how an IWB has been utilised by teachers in English lessons at Czech schools. The area of interest is narrowed down, so the paper focuses on two age categories of pupils who are approximately 10-15 and 15-19 years old.

The theoretical part of the thesis is broken down into five chapters. Technology in the broader sense and its relation to education are defined in the first chapter. It depicts the nature of the 21st century, which necessities the integration of technology into education, and imposes new demands on teaching and learning processes, and on acquiring new skills. After specifying ICTs, advantages and disadvantages of
technology are taken into consideration. The second chapter introduces two stages of children’s cognitive development formulated by Professor Piaget because, as mentioned above, the thesis is confined to two age groups of learners who are 10-15 and 15-19 years old. The former is covered by Concrete operations, and the latter corresponds with Formal operations. The purpose of the third chapter is to gain an awareness of how teaching processes should or are expected to transform under the influence of working with an IWB. The definition of an IWB is given together with bias that teachers may have against it. Lastly, advantages and disadvantages of an IWB, and teachers and learners’ beliefs accumulated so far by researchers from abroad are presented in the fourth and fifth chapters.

In the second part of the paper, research is conducted at grammar schools in Brno and Plzeň by means of observations and questionnaires. Hence, it is accordingly divided into two main chapters: the first scrutinizing the findings of the observations, and the second delving into the questionnaires. The data obtained from the research should discover whether teachers and learners like working with an IWB, and whether they regard it as a useful tool. Furthermore, the research should bring to light differences and similarities of using an IWB in English classes between the schools, and should map the current situation in the Czech Republic. Similarly, the collected data are compared to the findings of international research so as to conform or reject them. Finally, the results of the research should ascertain what is needed to be done or avoided in order to help teachers fully include an IWB into their teaching, and to improve teaching and learning processes with the aid of it.
2 Delineation of technology

The core of the thesis revolves around technology, but it is a broad term that needs to be specified. In the following chapters, the role of technology of our time and in education, the reasons for the installation of technological devices at schools, and their impact on teaching and learning processes as well as the characteristics of the modern era and the way of life of learners will be discussed.

With reference to Spector (2012), technology is a word of Greek origin, and its underlying meaning can be derived from breaking it into techne (art, craft, or skill) and logia (words, study, or body of knowledge), and from bringing the two parts together into “knowledge about making things” (p. 4). Nowadays, technology is associated with the way it is employed, therefore Spector postulates that it can be said to be “the practical application of knowledge for a purpose” (p. 5). It should be clarified that knowledge and purpose that figure highly in the definition can be matched to various areas, but in this paper they pertain primarily to the educational one. The essential ingredient of technology is its likelihood of instability, and without question, it has undergone a revolutionary transformation. On top of that, Spector adds that “technology changes what people do and what they can do”, which is another trait of technology called affordance (p. 5). He explains that affordance can be understood as a tool thanks to which something is feasible to do. Although originally applied to cognitive psychology, affordance has been embraced in “instructional design and development” as a medium of “function of something”. In spite of the fact that certain programmes were created for business, such as Microsoft PowerPoint, they have been borrowed as affordances, and have started to assist and facilitate teaching and learning processes (p. 123). From another point of view, affordances are regarded as “the properties or functions of technology that extend our learning and perceptual capabilities”. They are
either economic because of the pace of technology with which users can access information; social enabling users to converse and exchange information; cognitive helping to share and look up information; or affective making the way of sharing facts more appealing (Gagné, Wager, Golas, & Keller, 2005, p. 208).

Since technology permeates into education, educational technology is a new term arising from their combination. According to Spector (2012), it stands for “the disciplined application of knowledge for the purpose of improving learning, instruction, and/or performance” (p. 10). The disciplined knowledge refers to specialists who draw on already existing findings in the fields such as “cognition, cybernetics, information science, human factors, learning theory or mass communications”, which gives them the direction of their work, and which makes educational technology related to more academic fields (p. 10). Among educational technologies belong, for example, interactive whiteboards, instructions for the usage of a computer programme, or online discussions on education, and others that contribute to the process of gaining knowledge or skill (p. 8).

Technology plays a crucial role in characterising the 21st century as the digital age or the information age, and it is worthwhile to elucidate the word digital. According to Betcher and Lee (2009), before the invention of the personal computer, particular ways of conveying information were accessible, such as newspapers, cassettes on which recordings were preserved, “photographs taken on plastic film”, or films “stored on long rolls of celluloid”. It was inconceivable to blend such different types and styles in a single entity until the computer was discovered that enabled these types to fuse together (p. 10). During the course of several years computers have improved so much that now it is so simple to “mix almost any digital media – text, audio, images, video, animation” (p. 11). With reference to Zounek and Šeďová (2009), addressing the era as the digital
age helps underscore rapid changes brought about by a quick technological leap forward, and regarding it as the information age underlines knowledge to which society attaches considerable weight. Providing and spreading knowledge via technological devices causes that the dividing line between the digital age and the information age has become blurred. Consequently, this unstoppable progress has been affecting the whole society. In order to be able to meet the criteria that the transformed society is laying down, it is vital for educational institutions to decide which skills are required to be mastered, so as to prepare learners for successful functioning in life (p. 11).

2.1 Technology and education

To be able to justify the incorporation of technology in education, dominant motives linked to the nature of the 21st century and 21st century skills, with which learners should be equipped in order to become successful members of perpetually evolving society, must be examined (Tinio, 2002, p.6). The common denominator of the 21st century is the word global, which is quite aptly described by Solomon and Schrum (2007): “We live in a wired, globalized world in which communication and collaboration are possible 24/7” (p. 8). The two authors contend that a major technological advance has been the transmutation of the Internet into the World Wild Web, from 2004 known as Web 2.0, which invites users from all around the world to get and work together. Web 2.0 does not remain at the level of the Internet, from which information can only be withdrawn, but goes beyond all limits by allowing to “create and share”, or “edit, comment, polish a document collaboratively”. It no longer matters whether people live in the same country, Web 2.0 opens up endless possibilities of communication and teamwork of users over long distances (p. 13). Betcher and Lee (2009) write about digital convergence, which results from a high number of kinds of digital media being convenient to use; from being able to choose among a great variety
of technological tools in which these digital media are found, and from information circulating immediately and widely (p. 11). This essence of the 21st century asks for the extension and amendment of knowledge and requirements which many authors subsume under 21st century skills. According to the North Central Regional Educational Laboratory, these skills consist of digital age literacy, inventive thinking, effective communication, and high productivity, which are all subdivided into more specific skills outlined in table 1 (as cited in Solomon & Schrum, 2007, p. 19).

<table>
<thead>
<tr>
<th>Digital-Age Literacy</th>
<th>Inventive Thinking</th>
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<tbody>
<tr>
<td>• Basic, Scientific, Economic and Technological Literacies</td>
<td>• Adaptability, Managing Complexity and Self-Direction</td>
</tr>
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<td></td>
<td>• Curiosity, Creativity and Risk Taking</td>
</tr>
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<td>• Higher-Order Thinking and Sound Reasoning</td>
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<td>• Visual and Information Literacies</td>
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<td>• Multicultural Literacy and Global Awareness</td>
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<th>21st Century Learning</th>
<th>High Productivity</th>
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<tr>
<td><strong>Effective Communication</strong></td>
<td><strong>Prioritizing, Planning and Managing for Results</strong></td>
</tr>
<tr>
<td>• Teaming, Collaboration and Interpersonal Skills</td>
<td>• Effective Use of Real-World Tools</td>
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<td></td>
<td>• Ability to Produce Relevant, High-Quality Products</td>
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<td>• Personal, Social and Civic Responsibility</td>
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<tr>
<td>• Interactive Communication</td>
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| **Table 1 21st Century Skills**                           |

It is outside the scope of the paper to expatiate on each skill, but certain conclusions can be drawn. Living in the digital age predominantly calls for a new skill, digital literacy, which Gilster defines as being able to apprehend and operate technological devices (as cited in Gagné et al., 2005, p. 209), and Gagné et al. (2005) claim that digital literacy forms the basis of thriving in occupational, educational and
social areas (p. 209). In sum, the skills that were taken for granted years ago, that is reading, writing and mathematics, paved the way for finding personal fulfilment in life, whereas these days they would and do not suffice. To be knowledgeable entails being familiar with technological devices and various branches of scientific knowledge, or possessing worldwide knowledge and understanding; but above all, carrying on expanding individual’s horizons via processes such as “gathering, processing, analysing, synthesising, presenting information as well as communicating and collaborating” (Solomon & Schrum, 2007, p. 20).

Without doubt, each epoch shapes people, their behaviour, customs and habits, and so does the 21st century. Prensky claims that learners who are growing up in the age of technology are labelled digital natives because they are exposed to technology from their birth. Digital natives utilise all sorts of machines or gadgets with ease, or in a somewhat different fashion from the previous generation, who are called digital immigrants. It takes much more effort and time to digital immigrants to get used to working with technological innovations. It seems that the mode of thought of digital natives has changed completely, and education still following outdated teaching methods falls behind with such rapid growth (as cited in Spector, 2012, p. 124). Learners who are influenced by the digital age might desire schools to be equipped with the latest technological facilities because they are used to “playing video games, communicating using text messaging and instant messaging, conducting Internet searches, downloading music, and sharing files, and using the Web for homework” on a daily basis (as cited in, Solomon & Schrum, 2007, p. 25). Betcher and Lee (2009) assert that “children entering our schools do not know what it is like to not be digital (p. 11). To be conscious of what learners are like helps realise that they are “a wired generation” who may be the ones aiding the adults in the technological sphere (Solomon & Schrum,
2007, p. 26). Spector (2012) points out that teachers being essential ingredients in education cannot be overlooked, so what is pertinent to learners is to teachers, too. Some teachers are reluctant to accept and support technology, especially when certain exercises can be done by means of it, which renders teachers redundant, or it threatens to undermine their position, teaching methods, or classroom management. Therefore, when decisions are made, and “a user-centred technology innovation approach” is considered to be adopted, teachers must not be forgotten. To make sure that teachers will be inclined to give in, they must be instructed and encouraged to exploit the potential of such inventions as much as possible (p. 127).

Inevitably, the whole situation exerts considerable pressure on education which should conform to emerging challenges. The obsolete way of transmitting information by a teacher standing in front of learners, who after absorbing many facts learn them by heart and are examined, is no longer valued. Teachers are recommended that they frequently engage learners in group work in which learners must pull together to finish a task so as to learn skills connected to that type of activity (Solomon & Schrum, 2007, p. 21). As mentioned above, inventive thinking including higher-order thinking is believed to guarantee that the rewards will be reaped. Committee on Information and Technology Literacy states that learners should be led to pooling or brainstorming original, unconventional or inventive ideas, making judgments, or finding solutions to real-life issues (as cited in Gagné et al., 2005, p. 209). Gagné et al. (2005) add that what must be taken into account is the way learners handle information gathered from different sources than that from books or written material. Being exposed to a massive amount of online sources and data, learners must learn how to work their way through them, how to be “technologically literate” (p. 209).
Broadly speaking, incentives to integrate technology into education fall into three broader categories: “economic, social and pedagogical reasons”. Economic reasons are grounded on the awareness of demands of global economy, and on the possibility of making progress in this field thanks to technology, but also on getting learners ready for employment and a prosperous future. Social reasons remember the fact that each person is a member of society in which technology occupies a special place as well. And as mentioned above, it is not enough to be skilful at reading, writing and mathematics, but also at technology (Zounek & Šeďová, 2009, p. 11). Pedagogical reasons, with reference to Collis and Molenda, tackle the question of technology in teaching and learning processes. But to exhaust the reasons completely, Hinostroza et al. comment on the importance of technology for school management, as technology is viewed as the trigger of the whole chain of educational reforms or modernisation (as cited in Zounek & Šeďová, 2009, p. 12).

2.2 Information and communication technology

To reduce the vastness of the topic of technology, the scope of Information and Communication Technology (hereinafter abbreviated to ICT) and some forms of ICT utilised at schools will be delimited in conjunction with advantages and disadvantages for education.

According to Zounek and Šeďová (2009), the essence of ICT can be delineated as “modern audiovisual aids”, such as digital cameras, films or headphones; and digital technologies that have developed from computers and telecommunications, and which serving as the source of data make it viable and easy to find and use information (for example the Internet, an interactive whiteboard), and to come into contact with other individuals (e-mails) (p. 15). Similarly, Blurton maintains that ICT is a “diverse set of technological tools and resources used to communicate, and to create, disseminate, store
and manage information” (as cited in Tinio, 2002, p. 4). According to Reddi (2005), it would be misleading to conceive of ICT as the most costly technologies that are very advanced and complex, for it does include affordable devices open to the general public, such as radio, television and telephone; and the fact remains that ICT has become an integral part of life without taking any special notice of it anymore (p. 175). ICT has been attempted to be described in many ways, therefore at least one more perspective will be presented by United Nations Development Programme (UNDP):

ICTs are basically information-handling tools— a varied set of goods, applications and services that are used to produce, store, process, distribute and exchange information. They include the ‘old’ ICTs of radio, television and telephone, and the ‘new’ ICTs of computers, satellite and wireless technology and the Internet. (as cited in Reddi, 2005, p. 175)

Reddi (2005) clarifies that the old ICTs, with which the great majority of population has been acquainted, are designated as analogue media, whereas the new ICTs as digital media. Yet, the old and the new have started to merge with one another, which makes them almost indistinguishable. Although the descriptions of ICTs often target at highlighting the old and the new to tell the analogue and the digital apart, the boundaries between them are left unclear (p. 175). Nonetheless, these interpretations of ICT appear to be apt enough, and sufficient for the paper.

ICTs represent key components pervading all levels of education, therefore the forms of ICT and their brief historical background will be particularised. The first computers that appeared at schools can be traced back to the 1960s when the earliest form of ICT called Computer-assisted instruction (CAI) emerged (Zounek & Šeďová, 2009, p. 17). Steinberg argues that learning was “individualised”, and a learner was “interactive”, as learning was happening in a two-way interaction between a computer
and one learner. Computers guided and facilitated learners’ learning by examining them, and by giving them some feedback (as cited in Zounek & Šeďová, 2009, p. 17). Computer-managed Learning (CML) was similar to but one step ahead of CAI, as it cumulated and stored information about learners’ learning. However, Computer-assisted Learning (CAL), which focuses on “the process of learning”, has been met with tremendous success. Watson proposes that owing to CAL much more options for learning can be selected by way of computers (as cited in Zounek & Šeďová, 2009, p. 18). In Zounek and Šeďová’s words (2009), computers enhance learners’ abilities, such as “solving problems, creative work, using data from various sources, cooperation, social skills, or searching for information in databases” and so on (p. 18). One of the latest forms of ICT for learners of all age categories is e-learning, which “uses an information network – the internet, an intranet (LAN) or extranet (WAN)” in order to stay in touch with students, and provide materials for them (Tinio, 2002, p. 4). Web-based learning (WBL) is learning based on browsing the Internet to find out information, or on visiting websites on which learners fulfil tasks. With reference to Gillani, the purpose of WBL is that teachers can upload audio-visual materials such as “pictures, animations, photos, video or audio recordings”; it provides the opportunity for cooperative work; it is a reliable storage of information; and it is an outlet for creativity for learners who can display their works there (as cited in Zounek & Šeďová, 2009, p. 20). At last, blended learning interweaves conventional teaching and learning at schools with e-learning. Blended learning depends on who learners are, what is going to be taught, and the access to technological devices. The course can alternate between regular face-to-face sessions once or more times a week, and online work that fills the remaining days of the week when students work on their own in a way that suits them best (Gagné et al., 2005, p. 224-225). These forms of ICT raise the issue of
effectiveness, advantages and disadvantages of technology, which will be investigated in the subsequent subchapters.

2.3 Advantages of technology:

Broadly speaking, technology geographically and quickly disperses education which reaches those who were previously deprived of it because they belong to “minorities, girls, rural populations, and the elderly”. Distance learning has increased chances of studying for people who not being able to overcome certain obstacles, such as time and finance, cannot afford to go to any educational institution. Distance learning is much cheaper, generates a plethora of materials which are ceaselessly available, and allows for communication with others (Haddad & Draxler, 2002, p. 10). Tinio (2002) says that ICTs permit not just the disadvantaged, but also “mentors, experts, researchers, professionals, business leaders, and peers” a mutual exchange of expertise and co-operation (p. 6). In addition, Reddi (2005) propounds individualization of learning, as users study and work alone; and interactivity referring to the way users “go forward and backward in the content, start at any point depending upon prior knowledge” (p. 178). The advantages can be divided into two areas: learners/learning, and teachers/teaching, and will cover the multitude of technology mentioned above used in and outside class.

As for learners and learning, the findings of research carried out by Balanskat, Blamire and Kefala (2006) show that “motivation, attention, communication and process skills” of learners have risen markedly, learners are more engrossed in tasks that they take seriously, and are less disobedient (p. 30). Technology advocates a student-centred learning approach that goes hand in hand with “differentiation (especially in primary schools), with programmes tailored to individual pupils’ needs”. Students with special needs may benefit from ICTs because they make them focussed. While
completing tasks, teachers have space for monitoring learners and revealing their difficulties. ICTs create potential for teamwork, for setting longer or challenging assignments to learners, which promotes collaboration (p. 31). Zounek and Šeďová (2009) claim that learners can make the most of a wide range of technology, and be “creative” in order to prepare, for example, a presentation which if delivered in front of their peers improves their presentation skills. To be creative suggests weaving knowledge from different subjects while operating a wide array of programmes. Besides seeking information, technology can be “a tool for solving problems” because learners can analyse information before completing tasks (p. 23).

It has turned out that teachers embrace ICTs eagerly, they have pulled together, and put a lot of effort into planning and preparing their lessons (Balanskat et. al, 2006, p.36-37). Underwood points out that in some surveys it is spoken highly of reduction of time, and “long term planning which can be corporately shared in reducing teachers´ workload” (as cited in Balanskat et. al, 2006, p. 37). According to Zounek and Šeďová (2009), teachers can produce materials comprising “texts, various presentations, photos, or multimedia materials combining texts, pictures, sound”, and they can share these on the Internet with their students (p.21). Teachers do not have to worry anymore about making room for countless sheets of paper because they can save their electronic handouts and materials, which can be easily amended. Teachers can enhance the understanding of new concepts owing to gadgets which are designed to project illustrative materials or visual images on the wall. Apart from preparations, teachers’ job is to test their learners, for which relevant programmes have been devised, too (p. 22). This electronic testing is easier because corrections are made by a programme, and teachers can see and manipulate the results of individuals as well as the whole class. Teachers can keep track of their learners by preserving information about learners and
their achievements, which teachers can send to each other, and can use for instance when planning their lessons. Likewise, teachers can look up information in order to broaden their own horizons, or they can come across and take online courses (p. 23). No matter how promising the idea of technology in education may sound, disadvantages must be weighed against advantages.

2.4 Disadvantages of technology:

In general, “digital literacy is not a substitute for good parenting and effective teaching.” The fact that wisdom is best received personally from teachers and learners must not be suppressed. On the one hand, it might be true that human existence has changed for the better. On the other hand, the Internet discloses undesirable information, such as “pornography, or how to build bombs and conceal weapons” (Gagné et al., 2005, p. 213). Moreover, people are social beings, and any physical contact and natural interaction between humans may be lost. Humans are liable to develop addictions or obsessions, for example when “playing games” they may start to exhibit antisocial behaviour, or might give rise to cybercrime, through which harm is done to other people (Zounek & Šedová, 2006, p. 25). ICTs cost a lot of money, and they need to be kept in a good condition. It should not be forgotten that not everyone has “equal access” to them, and only those who have access can profit from them, which will strengthen so called digital gap (Reddi, 2005, p. 178). The disadvantages will be separated into three categories: learners, teachers, and school.

It has transpired that learners are not in favour of online courses because they take up too much of their free time, therefore learners try to allocate time spent at work to such courses. Furthermore, Clark and Mayer warn that learners must have a strong will and self-control otherwise their attention is likely to be distracted. There is nobody who would prompt them to carry on or change that learning or teaching strategy (as
cited in Gagné et al., 2005, p. 317). The authors presume that when learners encounter problems with “slow connection speeds, reception problems or long download times”, they might be put off and will refuse to continue (as cited in Gagné et al., 2005, p. 314). According to Information and Communication Technology in European Education Systems - EURYDICE (2001), teachers must bear in mind that learners are different in terms of their age and the level of cognition. Each group of learners has distinct “needs and expectations”, and despite the fact that a new piece of information can be received so quickly, it still takes longer time to take it in (p. 12).

With regard to teachers, EURYDICE (2001) directs attention to the function of teachers whose teaching methods and activities they are accustomed to using will have to be modified (p. 11). Many teachers lack skills necessary to integrate technology in teaching and learning processes, so they rather avoid using it. This determines their low motivation and hesitancy, which makes them reluctant to work with technology. The lack of skills, motivation and uncertainty reflects how neglected training and the support of teachers are, which calls for an urgent remedy (Zounek & Šed'ová, 2006, p. 25-26).

Even if teachers were trained and not afraid to use technology, there are hurdles that must be cleared at the level of schools. Many schools have not installed technology, and if they have, there is no care taken of technological devices available. If not working properly, ICTs make teaching and learning processes quite irksome rather than appealing. Sometimes, schools have a limited number of classrooms furnished with the latest machines, and therefore teachers must, for example, make a reservation for that room. In some cases, schools implement different procedures, and ICTs do not fit the philosophy of that school (Balanskat et al, 2006, p. 51-52).

These advantages and disadvantages will probably overlap with beliefs of teachers and learners, and the usage of an interactive whiteboard because all the issues
are built on a technological base. Instead of hesitating about the value of technology, it might be worth giving some thought to the following quote: “To ‘tech’ or not to ‘tech’ education is not the question. The real question is how to harvest the power of technology to meet the challenges of 21st century and make education relevant, responsive, and effective for anyone, anywhere, and anytime” (Haddah & Draxler, 2002, p. 16).
3 Cognitive Development: Piaget’s Theory

It is vital to include the stages of learners’ cognitive development, whose current level of cognitive thinking is influential, and should determine teachers’ decisions on various ways of working with an IWB. With reference to Fontana (2003), the term cognitive covers the ability to think, discover and learn things. Such abilities affect learners’ success or failure of learning, and therefore teachers must understand the level at which their learners are, as to enable them to grasp whatever they are teaching them (p. 63-65). The most famous theory of cognitive development, which comprises four stages, was introduced by a Swiss scholar Jean Piaget, but only two serve the purpose of this paper. Namely, the stage of Concrete operations that correspond in terms of an age category to lower-secondary learners attending basic school, and Formal operations corresponding to learners at secondary school (Vágenerová, 2012, p. 43-45). But before delving into particular features typical of the stages, Piaget’s perception of human beings’ process of thinking in general will be described.

To start with, according to Shaffer (1999), Piaget believed that intelligence can be defined by each individual’s capability of “adapting” to his or her milieu. To adapt means that an individual can deal with the instantaneous nature of a situation, for example, a thirsty child who is given a glass of water will take and drink it. While growing up, a human being maturates, and accordingly his or her accumulated knowledge is built into “more complex cognitive structures”. Piaget named a cognitive structure a schema, which stands for “an organised pattern of thought or action” that individuals utilise when trying to account for “some aspect of their experience” (p. 53). Moreover, children are brought to the world without possessing necessary knowledge to understand it, or without being provided with any insights into it by adults. What they
do is “actively construct” their interpretations of the world derived from their own explorations while employing their schemes (p. 54).

Yet, the matter of building the conception of the world is much more complicated. As Shaffer (1999) exemplifies, while a child is observing things around itself, it may conclude that clouds are living things, as they are moving in the sky. Since many other things that move are living things, a child will automatically regard any new moving object as a living thing. This is assimilation whereby a child integrates its new understanding of things into schemes already evolved in its cognition. In the course of time, a child will notice that objects which are moving cannot possibly be living things. Suddenly, child’s schemes do not go hand in hand with the truth, and a child must seek a new understanding and alter its schemes or cognitive structures. This “reversed process” is called accommodation, that is, a child adjusts its scheme so as to fit its new experiences. Going back to the definition of intelligence by Piaget mentioned above, it can be specified that the adapting lies in equilibrium, in other words, in congruence between cognitive structures of an individual and his or her surroundings (p. 54). In addition to assimilation and accommodation, the author mentions that a child perpetually restructures or amends its schemes into “more complex intellectual structures”, which is the third process called organisation. As a result, a child comprehends that red, blue and pink are all subordinate to, and subsumed under a more general term colour (p. 232).

As mentioned above, four stages of cognitive development together with their distinctive mental processes were subsequently propounded by Piaget. With reference to Shaffer (1999), Piaget held the periods to be invariant developmental sequence because of each stage being the cornerstone or building block of its consecutive stage, and their
dependence on children’s process of maturation. The possibility of a child skipping one stage or proceeding against the sequence of stages is ruled out (p. 54).

Again, two stages of cognitive development are relevant for the paper, and the lower stage called Concrete operations will be discussed first.

3.1 Concrete operations (7-11 years)

After Sensorimotor (Birth-2) and Preoperational (2-7) stages, a child enters the third phase of cognitive development - Concrete operations - covering approximately the period from 7-11 years, which overlaps with lower secondary stage of basic education. According to UNESCO Institute for Statistics (2012), lower secondary stage most frequently commences in the sixth year of education after children’s completion of primary education, which is approximately the age of 10-12; and finishes after nine years that elapse from the beginning of primary education when children are 14-15 years old (p. 33-34). A child who has reached this level is able to apply more logical or abstract kind of thinking to various concepts, but is still confined to concrete situations, as the name of the stage itself suggests. On condition that children have some previous experience from the past, they can work with, remould or revise abstract theories, facts or notions. Being restricted by the need of having past experience, children are most likely to “describe their surroundings rather than explaining them”, and thus to provide examples of things without attempting any definitions of them. Generally speaking, their thinking is much more structured and cohesive (Fontana, 2003, p. 69).

Some of the most noticeable and noteworthy processes which a child acquires at this stage are decen
trat**

tion, reversibility and conservation. In contrast to the lower stages of thinking, at which a child concentrates on most conspicuous features of an object, decentration enables a child to take into account more perspectives of how to look at things, and to spot various characteristics of objects (Shaffer, 1999, p. 246). A common
experiment carried out with children was in giving them two differently shaped bottles full of some substance which was poured from one bottle to another. When asked whether the amount of substance changed, the child being able to consider different shapes at this stage knew it remained the same, and did not decrease or increase in the original amount; something that a younger child would be convinced of. Simultaneously, the child could imagine that the act of pouring the substance back to the first bottle is possible, or it could be reversed, and hence the name reversibility (Piaget, 1932, p. 132-133). Vágnerová (2012) points out that owing to reversibility a child solving a task in a wrong way is able to start all over again by using a different approach (p. 270). Finally, she expounds on conservation standing for child’s realising the stability of properties of objects which stay constant. For instance, children can understand that if a round object is flattened or vice versa, it is the same object of the same size (p. 269).

In Fontana’s words (2003), had it not been for the main cognitive structure classification, these processes enumerated so far would not be happening. He claims that classification helps children cope with problematic tasks, and give them greater apprehension of the world. Once classification is established, seriation appears instantaneously. Thanks to decentration children can recognise the whole variety of traits of objects which can be further “classified”, or organised into classes with their relevant subclasses according to their mutual features. If a child were shown 5 apples and 3 oranges, and asked whether there are more oranges or fruit, a child would be able to give the correct answer because it can now distinguish between the general term fruit and its subordinate terms. Not only can children create such organisational structures, but also on the basis of, for instance weight, size or height of objects, they can put these specific features of things in a right order by means of seriation. As a result, a child
asked to order objects from the shortest to the longest ones will not struggle when doing so (p. 70). The authors state that children are equipped with transitivity, which is a tool for discerning relations in a succession of similar things. And thus a child is able to reach a conclusion that a car is bigger than a skateboard if a car is bigger than a bicycle, and a bicycle is bigger than a skateboard (Shaffer, 1999, p. 250, Piaget, 1999, p. 135-136, Vágnerová, 2012, 273). Before moving on to the stage of Formal operations, it is worth raising the issue of Piaget’s opinion and advice on teaching processes. Firstly, teachers should be aware of learners’ level of cognition, and link new information with schemes children already have, for children are naturally eager to gain new knowledge, and they like modifying it if it contradicts the old one. Secondly, teachers should cater for individual differences, and prepare tasks that suit individuals’ needs. Thirdly, Piaget tried to attach importance to children’s independence from teachers who should not let learners silently listen to their lecturing, but rather get them to find things out for themselves. Since, as mentioned above, children construct their own understanding of the world (Shaffer, 1999, p. 251). Applying Piaget’s recommendation on today’s emergence of the usage of an IWB, it seems to be exactly in congruence with all kinds of exercises an IWB offers to their students. Provided that a teacher allows them to do so, learners can be drawn into self-discovery by manipulating an IWB and searching for information on their own, which places a teacher in a position of an observer or a helper rather than a director of teaching and learning processes. By estimating the level of learners, teachers can select appropriate programmes and activities targeting a great variety of learning styles and individual preferences of learners, for which an IWB is designed, and which hopefully facilitate learners’ comprehension and enhance the enjoyment of learning. If an IWB is or is not used in this way, which would acknowledge Piaget’s suggestions, will be revealed in the practical part of the paper.
3.2 **Formal operations (11 and beyond)**

When a child turns approximately 11 or 12, the age which co-occurs with the beginning of an adolescent period and continues beyond the age of 12, its thinking is undergoing another change. To be precise, the adolescence period can be further broken down into two stages. The earlier stage commencing when a child turns 11 and finishing at about 15 is sometimes called pubescent because of visible and distinctive physical changes. The later stage continues from the age of 15 until about 20, during which an adolescent faces to many mental and social challenges (Vágnerová, 2012, p. 369-370). Until this stage, children relied on concrete or already experienced situations, yet at the stage of Formal operations their thinking crosses the boundary of this limitation, its quality of being abstract is enhanced, and so called hypothetico-deductive reasoning commences (Piaget, 1999, p. 139, Fontana, 2003, p. 71). Within hypothetico-deductive reasoning begins deductive reasoning signifying the capability to illustrate concrete examples obtained from general principles. An adolescent ruminates on all kinds of ideas, statements or abstract matters, and contemplates what it would be like if things were different from what they are. Adolescents have no difficulty in operating with abstract symbols or signs, and in generating hypotheses even if they are detached from their prior experience or the truth (Vágnerová, 2012, p. 379-380). Vágnerová (2012) and Shaffer (1999) assert that adolescents are competent at inductive reasoning, which is the exact opposite of deductive reasoning in that it starts with being familiar with concrete examples out of which general principles are formulated (Shaffer, p. 251-252, Vágnerová, p. 379-380). Furthermore, Shaffer (1999) reports on “personal and social implications of formal thought”, which may positively prompt adolescents to raise the awareness of their sense of selves, their demeanour, other people’s outlooks on life, or what realistically can be done. Adolescents are wary of choices they have to make in
their lives when being at a crossroads, and possible outcomes which inevitably follow such choices affecting them and others. On the negative side, adolescents being open to forming hypotheses and no longer clinging to reality might doubt and contradict actions adults take from which social or political repercussions ensue, for example, injustice in society. Piaget reasons that adolescents are ordinarily inclined to construe the world as perfect or flawless, and their new ways of thinking display lack of mutual understanding between them and adults (p. 254). Closely related to that is metacognition, which stands for adolescents’ more precise judgement or evaluation of their own abilities, which in turn reflects a faculty for self-observation of their own thoughts, feelings or emotions. In the field of education, adolescents can assess and estimate what they can accomplish, or they refuse to settle for one solution to solve a problem, especially when knowing there are plenty of other options to choose out of. However, adolescents are liable to underestimate their abilities, or they fear that they may be unsuccessful or underperform (Vágnerová, 2012, p. 383).

To sum up, “formal-operational thinking is rational, systematic and abstract. The formal operators can now think planfully about thinking and can operate on ideas and hypothetical concepts, including those that contradict reality” (Shaffer, 1999, p. 254). When working with an IWB and learners at the level of Formal operations, teachers can afford to employ more abstract and stimulating tasks and topics, but at the same time must be careful that learners will not lose face in front of their peers, should they have trouble doing a task. In the practical part of the paper, it will be compared which activities are favoured among learners at basic and secondary schools in terms of the difficulty of tasks and classroom management.
3.3 Sociocultural perspective

In short, another contributor to cognitive development deserving attention is a Russian scholar Lev Vygotsky, who came up with Sociocultural perspective. He condemned Piaget’s thought that children grow up and develop irrespectively of sociocultural context as wrong, and placed an emphasis on social interactions with people with whom children are in close touch. A child growing up in society will unavoidably pick up societal and cultural norms and habits, which will shape its thinking (Fontana, 2003, p. 76-77). As Shaffer (1999) writes, Vygotsky agreed with Piaget on children’s curiosity, which propels them to explore the world, but he underlined an invaluable aid to learning on the part of adults who act as a role model to children who would otherwise struggle to resolve a problem on their own. For the reason that adults are more proficient and experienced than children, Vygotsky called this assisted learning the zone of proximal development. But for children to be able to work its way through a particular activity, instructions given by adults must be attuned to the current level of children, who can only benefit from comprehensible teaching. This is a key element that functions within the zone of proximal development called scaffolding (p. 260). Shaffer (1999) makes connections between Vygotsky’s and Piaget’s theories and the educational sphere, in which both of them promoted to encourage children to be actively engaged in tasks, and building on their previous knowledge. But Vygotsky denied Piaget’s idea of leaving children alone, and assumed that children make the most of teachers’ advice and their arranging of classroom activities, and take advantage of working in groups in which they can help each other (p. 262).

To connect Sociocultural perspective with the usage of an IWB, it can be inferred that teachers play a crucial role in class, and in preparing relevantly challenging
tasks that are manageable (not too incomprehensible, not too easy) simply just one level above children’s cognition, so as not to hinder learners from learning something new. Teachers should show learners what to do before letting them attempt to achieve a certain task on their own. Learners thus primed with essential instructions can explore and work with an IWB individually, or they can cooperate with their peers. Learners should be able to come up with a solution to a task that expands their horizons and extends their knowledge, while teachers should give them a chance to be actively involved in manipulating an IWB. Whether or not teachers conform to Vygotsky’s ideas will be as well disclosed by the research.
So far a wide range of technology and ICTs, and how they have influenced education was defined. However, it is an interactive whiteboard (hereafter an IWB) that represents a special interest of the paper. An interactive whiteboard belongs in a category of the new, latest and newest device, which is gradually earning a place at schools around the world. The purpose of the paper is to disclose the current status of an IWB in the Czech educational environment by scrutinizing what position teachers and learners has taken on an IWB, which advantages have been bestowed, and which disadvantages have been experienced. These issues examined primarily abroad will be explored in the following chapters, and the findings of international research will establish the solid background of the practical part of the paper. First of all, the impact of an IWB has had on teaching and learning, and how teachers employ it when teaching will be contemplated, for this will be observed during the research.

4 Pedagogic change

Reformations have always been encountered in education, for example Betcher and Lee (2006) posit that already in 1801 blackboards were put up in classrooms which have become strongly associated with school equipment. The then revolutionary blackboard changed teaching methods in the two previous centuries, and can be regarded as the ancestor of an IWB, which has similarly begun to shape the 21st century. There is a long way to go before the full potential of an IWB is exploited. The development of an IWB is still in its infancy, but it has already triggered a wave of deserting an old-fashioned mode of paperwork for the sake of digital learning (p. 1). It would be teachers’ false assumption to think that they will start using an IWB in a way they have used a blackboard with the only difference of the former producing digitalised materials. Quite the contrary, teachers are expected to abandon their old teaching
methods, and start coming up with fresh teaching ideas being now feasible to be implemented (p. 2). It does not mean that teachers will have to start from scratch and teach differently, but they should “rethink an existing concept”, that is, replace an outdated blackboard, which they have acknowledged and positive effects of which they are aware, with a progressive IWB (p. 3). Unfortunately, Betcher and Lee (2006) postulate that the educational field falls behind with the pace of “the rapid global change”, and while many occupations faded away or have been adjusted to the present situation, in the educational sphere learners still find themselves seated in rows of tables, looking at a teacher, a blackboard, and a textbook. When school is off, it is fashionable for learners to make use of technology, via which they are used to receiving information swiftly. It is not surprising that when being at school, they expect the same thing to happen, so “they need to multitask, they love to collaborate” (p. 47). As mentioned in the previous chapter, Web 2.0 and the Internet have resulted in teachers (among many others) all around the world being in touch, and thus they have reached an agreement on a forthcoming reformation of education. They feel the reformation is a must, the initiator of which could be an IWB. Next to e-learning, e-teaching has arisen from the necessity for change. E-teaching stands for “the use of information and communication technologies to enhance the act of teaching”, in other words, teaching is supported by technology (p. 48). E-teaching elevates teaching which can only be fruitful and beneficial to learners when it stems from ardent, erudite teachers who instil their enjoyment in their learners, and not from the number of learners per a teacher, or financial issues of schools. Within the concept of e-teaching teachers are advised to enrich their lessons by technological devices as much as possible, thanks to which they will depart unconsciously from a deep-rooted, one-way and teacher-centred approach (p. 49). Many authors concur with this pedagogic change, yet it can take place on
condition that “technology is more than an aid, or an extension device. Pedagogic chance is necessary so that the technology becomes a transformative device to enhance learning”. Teachers should be able to demonstrate “a more interactive approach to teaching” (Glover & Miller, 2001a, p. 258). This claim is strengthened by Spector (2012), who writes that teachers do not engage learners in working with an IWB, but for them it is “a projection device” (p. 152). Therefore, according to Türel and Johnson (2012), a crucial factor is how teachers put the usage of an IWB into action (p. 381). That is determined by teachers being able to get the best out of an IWB by giving effective instructions, for instance, they can switch between slides to refresh previous subject matter and aid learners’ comprehension (p. 382). Further determinants have been identified, such as teachers’ personal convictions, time spent working with an IWB or teachers’ proficiency in it (p. 383). With reference to Betcher and Lee (2009), teachers actually go through three stages beginning with the lowest one “doing things in old ways”. At the first stage a classroom is furnished with an IWB, but a teacher is ignorant of its possibilities, and an IWB is treated as if it were a blackboard (p. 50-51). Teachers who realise that working like that is pointless can leave this stage for the second one “doing old things, but in new ways”. At the second stage teachers fall back on their materials, but they more or less amend them with the help of an IWB knowing it will ease the burden on them, and draw learners more in classroom activities (p. 51-52). When entering the third stage “doing new things in new ways” a teacher does not question an IWB anymore. An IWB stops being just a tool for passing information on learners because it shapes teachers’ pedagogy by their experimenting, trying things out, and it develops into an integral element of teachers’ techniques (Betcher & Lee, 2009, p. 52-53). Likewise, Miller, Glover and Averis claim that teachers’ teaching is moving from their “existing didactic approach” to displaying the first signs of “an interactive
approach”, and then even to following “an enhanced interactive approach” (as cited in Betcher & Lee, 2009, p. 61). In addition, Duran and Cruz find the ways of using technology more important than just the provision of an eclectic range of technological tools. In the authors´ view, the successful outcome of utilising an IWB relies heavily on teachers´ acceptance of technology in general (as cited in Öz, 2014, p. 158).

As a consequence of the three stages mentioned above, teachers have been categorised as “missioners, tentatives and luddites” embodying a typical manner of using an IWB built on teachers´ stance they take. Missioners are proficient in working with an IWB because they have attended training sessions. They are keen on it, the more so if they have unlimited access to it, which makes it easier for them to get better. They endeavour to infect others with their zest for an IWB. Tentatives are beginners, who have been to a training programme, and have been instructed what to do. Those teachers are provided an opportunity for teaching in classrooms where an IWB is installed, which they truly seize and invest time in self-improvement, but they are too afraid of not being trained enough, or their preparation being too time consuming. If being sufficiently backed up, they are on the verge of becoming missionaries. Luddites, who are not deprived of training courses, or to whom access to classrooms with IWBs is not denied, are not willing to give up on their routine teaching. Teachers worry about an IWB, as it is an unfamiliar and an unexplored area. They are suspicious of its effects on teaching and learning processes, or are firmly convinced of it being disruptive to traditional teaching (Glover & Miller, 2001b, p. 2-3).

4.1 Pedagogy and Interactivity

Two terms, pedagogy and interactivity, have remained untouched. First, what kind of pedagogy or teaching methods teachers should adopt. Second, as what interactivity is conceived of. Pedagogy is, in Kent’s words, “those things in the
classroom that can have an influence on learning” (as cited in Gregory, 2010, p. 32). Gregory and Connolly gathered enough statements from teachers that are a testimony to “good IWB pedagogy”, which urges that a pedagogic approach should change:

- The greater the immersion with IWB through daily use, the greater knowledge and skills with how they work and what is possible
- Simple activities are best to start within the classroom; building up to more complex ones
- Begin by using other people’s resources
- Create relevant resources that fit learners’ context and interests
- Embrace students’ keenness to work with IWBs and harness this to gain their engagement in learning by facilitating classroom interaction
- Avoid the use of IWBs for simple projection of the same content used in presentation or on regular whiteboards (as cited in Gregory, 2010, p. 32)

Interactivity mentioned above is closely connected to an IWB which itself bears the word interactive. Nevertheless, the definition of interactivity might pose a challenge, and as Dostál (2009) emphasises, utilising an IWB does not necessarily entail teaching in the mode of an interactive approach. He enumerates possible interactions: “between a user (a teacher or a pupil) and a technological device (an IWB or a computer); between a teacher and learners or among learners themselves”. Even if teaching and learning processes occur without an IWB, learners and teachers act on each other. Whereas if an IWB is available, an interactive approach can be reinforced, provided that it rests on learners’ active participation in order to achieve pedagogical aims. With regard to a teacher, he or she is turned into a facilitator who “facilitates, enables, helps and supports” teaching and learning processes. He or she is the one who is in charge of the flow of discussions, group or individual work, and of eliciting learners’ choices of
solutions to problems (p.15). Dostál (2009) proposes that an interactive approach to teaching might be too obscure and easily misunderstood, and therefore he favours the term “teaching supported by interactive tools” (p. 16). Orr (2008) maintains that interactivity can signify physical contact between a learner and an IWB, such as “dragging things about the board” (Introduction, para. 6). The author adds an interesting division of interactivity into three areas put forward in a report by The Department for Education and Skills: “technological – interacting with the software; physical – going up to the board; and conceptual – using the board to break down and reconstruct ideas and facilitate recognition of the learning process itself” (Introduction, para. 9). Lessons are, according to their report, interactive when they are livened up by debates in groups and pairs triggered by the usage of an IWB rather than physically touching it. It is these moments contributing to educating learners that should be watched carefully, for they are more profitable. Hence, simple physical touching does not suffice, and should not be overestimated (Introduction, para. 9). Betcher and Lee (2009) coincide with the proposal for interactivity being split into “physical and intellectual”, the latter being preferred to the former (p. 59). Intellectual interactivity, or discussions, makes learners assert themselves. It helps them react to, accept or refuse opinions of their peers, and persuade the others by their arguments, and thus their cognition is most stimulated. Physical interactivity does not lend itself to thought-provoking tasks that can be handled just by a single student (p.59-60). Intellectual interactivity is chiefly fulfilled when a teacher goes through the third stage of “new things in new ways” (p. 61).

In fact, an IWB has begun to shift teachers’ pedagogy towards “more interactive, constructivist approaches”. Teachers seem to accumulate more modern, contemporary teaching sources for learners who gain knowledge efficaciously when obtaining versatile input from an IWB (Betcher & Lee, 2009, p. 61). According to research carried
out by SMART technologies (2004), there are three tendencies of learning. The first one corresponding with a constructivist approach is constructivism, which was already mentioned in the chapter on Cognitive Development proposed by Piaget. Constructivism promotes the ability to collect and process information, to suggest explanations concluded from that information, and to combine manifold ideas into a single system. Second is active learning, which reverses the dominant role of teachers who disseminate knowledge and the passive role of learners who receive it, and makes learners independent from teachers and responsible for their learning. Third is whole-class teaching, which centres on a teacher who gels a class into a team responding to one another, and who directs learners and their learning (p. 5).

The practical part of the paper will focus on these matters. It should be revealed into which category teachers fall at Czech schools, whether their pedagogy has been affected by utilising an IWB, and how they manage a class.

4.2 The Definition of an Interactive Whiteboard

The first interactive whiteboard emerged in 1991, and was launched by SMART Technologies Inc. Those who discerned the quality of an IWB and its driving force of advancement come mainly from the USA and the UK (SMART Technologies, 2004, p. 5). Initially, an IWB was intended to be established in business, but it appeared later at universities and colleges, and soon penetrated into elementary schools (Gregory, 2010, p. 31). So, an IWB has entered all layers of education, and has spread to all subjects and over many European countries (Dostál, 2009, p. 11). There is a substantial lack of literary work, as an IWB is a state-of-the-art technological device, but research has been done, and numerous collections of experience and findings of school participants have been uploaded on the Internet, or released in periodicals; the predominant suppliers being the UK, the USA, Canada and Australia. The action is
most evident in the UK, as Arnott gives a verbatim account of Charles Clarke, the former Secretary of State for Education and Skills, who confidently announced that “every school of the future will have an interactive whiteboard in every classroom, technology has already revolutionised learning” (as cited in Heather, Smith, Higgins, Wall & Miller, 2005, p. 91).

Many authors describe an IWB alike, and in this paper a definition adopted by Becta (2003) will be quoted, and expanded on below:

An interactive whiteboard is a large, touch-sensitive board which is connected to a digital projector and a computer. The projector displays the image from the computer screen on the board. The computer can be controlled by touching the board, either directly or with a special pen (p. 1)

There are some details missed out, for example, as soon as a user touches the screen, an IWB sends this “information from the board to the computer” (Öz, 2014, p. 157). Besides a pen or the finger, an IWB is equipped with a computer keyboard. An IWB allows for synchronous transmission modes, in which “two-way interaction between the teacher or student and the medium” is happening. It has an asynchronous function, too, which saves class work to which teachers and learners can return in the future (Beeland, 2002, Literature review, para. 1). These procedures depict functions of an IWB when being on, while when an IWB is off, a touch-sensitive board, a projector and a computer merge into an ordinary whiteboard whose surface can be used for making notes as it is in the case of a blackboard. Moreover, teachers can share their materials with each other thanks to “software packages”, or they can “use multimedia material including electronic microscopes, video-clips, board work, data tables, sketches, CD-ROM, or Internet images” (Glover & Miller, 2001b, p. 1). An IWB can be either fixed to the wall, or to a stand, and is approximately “2 metres by 1 metre in size”
(Schmid, 2006, p. 47). In comparison to forerunners of an IWB, an IWB has been internationally acclaimed because it encompasses all these usually one-purpose devices, such as “chalkboard, whiteboard, television, video, overhead projector, CD player, and computer” (Öz, 2014, p. 156). For this reason, a label “a digital hub” is attached to an IWB because it is the focal point of a classroom integrating various electronic media into a complete unit. A teacher does not have to separately turn on TV or a computer and so on in order to play a film or browse the Internet anymore, as everything is readily accessible in an IWB. This is for sure a powerful, persuasive argument for the integration of an IWB into education (Betcher & Lee, 2009, p. 12).

4.3 Bias towards an IWB

Notwithstanding the possibilities of an IWB, Dostál (2009) detected teachers’ bias against it during doing observations in class. He says their bias could hinder the inclusion of an IWB at schools, and therefore should be denied (p. 12). He lists teachers’ prejudices and attempts to correct these distorted impressions as follows:

As mentioned above, the mechanism of an IWB has been devised in order to cover the whole range of subjects and not to put one particular subject first (p. 12). A teacher does not have to despair of creating all materials unaided because he or she can surf the Internet to look up skeletons of lessons ready to be conducted or to be rearranged. Furthermore, teachers can teach with an IWB even if they skip the preparation of materials altogether because they can be generated simultaneously in the course of a lesson. An IWB is not confined to any age group of learners, but is appropriate for students of all age categories, so it can be placed in classrooms at basic, secondary schools as well as at universities. An IWB is meant to be used by all participants in a class, so a teacher should not assume that only he or she is privileged to work with it, and should allow learners to take turns in operating it. If teachers are
accustomed to certain teaching methods and the organisation of pupils, an IWB will not prevent them from any sort of strategy as they sometimes presume, for it is a very flexible tool. Many teachers might be of an opinion that an IWB and computers should be kept side by side in special classrooms, but it is the opposite way round, for an IWB should be part and parcel of ordinary classrooms. A traditional board does not have to be dispensed with or thrown out from classrooms at all costs. Although some teachers will defend their views on having only an IWB to hand and no more boards, some teachers will feel disadvantaged without conventional ones (p. 13-14). Fastening an IWB firmly to the wall is not necessarily needed, for it may cause trouble for tall learners who have to crouch down and small ones who have to stretch out their arms to write on it. Hence it is advisable to fix an IWB loosely in order to be able to move it up and down or from side to side, so that everyone can reach it without struggling. In addition to the teachers and learners right’s of equally using an IWB, the same reasoning applies to an IWB being able to be operated by more users concurrently. If more learners are not permitted to stand in front of an IWB and work together, the sole purpose of it will be destroyed. An IWB is also suitable for the disabled. For those who are visually impaired images on an IWB can be blown up, those who are restricted in movement can use tablets by means of which they can connect to an IWB, or those who have difficulty in writing with a pen or chalk can write with their fingers. An IWB is intended for all learners regardless of their age and for all teachers; everyone can come to grips with it (p. 14).

It can be anticipated that some of this bias will be reflected in teachers’ beliefs, which will affect their teaching. But before looking into beliefs, a list of advantages and disadvantages of an IWB will be drawn.
5 Advantages and disadvantages of an IWB

In this chapter, inferences that have been made by many authors about advantages and disadvantages of an IWB will be reviewed. These advantages and disadvantages usually laid the groundwork for their subsequent research on teachers and learners’ beliefs of an IWB, as is the case in this paper, in which the results will be compared to the research in the Czech environment. Similarly to some authors who attempted to divide advantages and disadvantages into three large areas, namely teachers, learners and a technological or functional side of an IWB, the chapter will be devoted to these particular spheres, too. But since the functions of an IWB substantially overlap with and are responsible for drawbacks and benefits for teachers and learners, this chapter will split advantages and disadvantages into two categories: learners and teachers (including learning and teaching processes), and the technological side of an IWB will form a component part of them. After having enumerated pros and cons of an IWB, teachers and learners’ perceptions accumulated by these authors will be brought to light, and will be set against the findings reported in the final part of the paper.

5.1 Advantages

5.1.1 Learners

One of the biggest advantages of an IWB is that it is capable of spicing up or enlivening lessons. If an IWB is able to eradicate boredom from classes, then it makes lessons pleasant, appealing and learners more alert to what is going on, plus they present themselves well (Smith, Higgins, Wall & Miller, 2005, p. 96). An IWB is a powerful incentive for learners to work harder, and they feel enthusiastic about gaining knowledge. But as Dostál (2009) warns, an IWB might increase learners’ motivation just partly, it is definitely not fully responsible for that (p. 14). A high degree of
motivation stems from learners’ involvement, and is conducive to favourable learning outcomes. Motivation especially improves when an IWB is used in classes in which learners actively take part in debates and interactive tasks (by the latter is meant the physical kind of interaction), for learners rejoice in touching an IWB (Agostini, Biase & Loregian, 2010, p. 275). Learners who are digital natives living in an era in which technology is so trendy will feel grateful for being given a chance to use an IWB at school, which brings a “wow factor” to them (Orr, 2008, Introduction, para. 12). In effect, an IWB stands out from other tools because of two features being exclusive to an IWB: a screen being directly touchable, which facilitates learning, and the overlap of physical and intellectual interaction. An IWB being multi-touch technology allows everyone to get together in front of it, so that learners and a teacher can have a go on it. Learners can observe what their peers are doing, can react to that and better comprehend aims of their peers that guided their actions. Physical interaction with an IWB also enables all users to move their bodies in a spontaneous or unaffected fashion, which in turn helps to get their message across (Agostini et al., 2010, p. 275). It is alleged that the more learners are permitted to touch an IWB themselves, the more they get out of it; most notably if they can talk to each other about their actions afterwards. When a teacher touches an IWB while learners are only watching him or her, learning will not be gained to the same extent (Winzenried, Dalgarno & Tinkler, 2010, p. 536). It is possible to physically interact with a screen of an IWB in various ways, for instance, “layering pictures or text, overwriting, highlighting, hiding, revealing, dragging and dropping text, pictures” and so on (Orr, 2008, Introduction, para. 12). Learners will certainly benefit from both types of interaction because working with an IWB entails sharing learners’ ideas, thoughts, proposals, solutions etc. as well as cooperating, being able to communicate with one another, listening to and interacting with the others and
so on (BECTA, 2003, Key research evidence about interactive whiteboards, para. 4). When learners finish a task they can show off what they have achieved and are so proud of, which encourages learners to be original and inventive. Because learners revel in working with an IWB, they are more willing to pay attention to their peers, more engrossed in class activities, and they help each other (Öz, 2014, p. 157). Thus learners who are praised or are paid compliments from their peers begin to believe in their own abilities, and become less nervous or frightened (BECTA, 2003, Key research evidence about interactive whiteboards, para. 4). As a result, intrinsic motivation is strengthened when learners can show their peers what they have accomplished by using an IWB, which boosts their confidence; and extrinsic motivation is enhanced when learners get carried away with “wow factor” of an IWB, which drives them to learn diligently. If learners do classroom activities for sheer joy and are extrinsically motivated, they will look forward to attending such classes, which may reduce their truancy (SMART Technologies, 2004, p. 7). What is a big plus is that learners who take pride in their educational attainment must not worry about losing their products because they can be stored and preserved in an IWB (Aytekin, AbdulAziz, Barakat, Abdelrahman, 2012, p. 287). Due to the memory storage of an IWB, learners can cut down on putting down every piece of information because materials prepared in the course of a lesson can be printed and distributed to them (BECTA, 2003, Key research evidence about interactive whiteboards, para. 4). Many authors emphasise that an IWB is, above all, a visual tool having multimedia and multi-sensory capacity. Being multimedia or multi-sensory technology an IWB projects visual images which easier engrave in learners’ memory, and are much more effortless to be retrieved. Learners have less difficulty in apprehending new subject matter because an IWB offers to see things “in sharp colours”, and “to annotate, conceal, manipulate, move and zoom in on or focus on
images, including text” (Smith et al., 2005, p. 97). In addition, all sorts of elements, such as “text type, colour, symbols, pictures, hyperlinks to sound files, video clips and internet pages” can be combined or brought together (Orr, 2008, Introduction, para. 12). All these images being larger, vivid and presented to students by a teacher on a big screen “may be easier to follow” in comparison to smaller computer screens on which a small mouse icon can escape learners’ attention, and in front of which learners can hardly make room for everyone to be able to see (Smith et al., 2005, p. 94). Since an IWB can blend sounds, pictures and other media, it diversifies information so that learners can fathom more taxing theories or notions quicker and without too much trouble (Smith et al., 2005, p. 97). An IWB caters for learners’ needs and covers an extensive range of learners who vary in age, social positions, cultural identities, personal qualities, cognition, learning styles, and who may be handicapped or demand special care. The multi-functional feature of an IWB aids learners in pondering on their own and their peers’ cognitive thinking and learning styles. In a class consisting of learners of diverse backgrounds, the interactive and cooperative nature of an IWB maximises the opportunities for a rich exchange of opinions or knowledge, and for exemplifying distinctive ways of perceiving the world. In this sense “individual differences become resources, opportunities for metacognitive, peer-to-peer and mutual learning” (Giglioli, 2013, p. 11). There are three learning styles of learners whose learning can be fostered by exploiting an IWB in a relevant manner that suits these styles. First is a visual style, for which it is advisable to let learners work with textual materials, watch films and move, rearrange or look at images. Second is an auditory style, which includes activities centred on sound such as speaking, conversing, articulation, poetry or singing. Third is a tactile style based on movement, therefore tactile learners will take pleasure in a physical kind of interaction, or else in touching an
IWB (Beeland, 2002, Introduction, para. 2). As mentioned above, an IWB is of use to students with special needs, too, owing to its big screen on which images can be enlarged. Its magnetism captivates learners who have for instance behavioural problems, such as ADD (Attention Deficit Disorder), or other special needs learners, and those who are visually/hearing-impaired, or deaf (SMART Technologies, 2004, p. 9). This set of advantages might create the impression that an IWB is a very clever and universal device, but nothing is flawless. Some of its advantages listed above have been doubted by some authors, and its disadvantages must be taken into account. Before that, advantages for teaching will be scrutinized.

5.2 Advantages

5.2.1 Teachers

In the first place, what has been said to be the profits of an IWB for learners so far is not caused by an IWB itself. Broadly speaking, it is an indication of excellence in teaching, for which any device cannot substitute. “Good teaching is good teaching.” Yet an IWB incorporating the Internet, web pages or multimedia has the power to transform already satisfactory teaching into splendid one (Betcher & Lee, 2009, p. 55). For teachers an IWB can be a catalyst for meditating on their teaching and altering it, for applying technology into teaching and learning processes, and for their professional growth (BECTA, 2003, Key research evidence about interactive whiteboards, para. 3). On the one hand, a teacher standing in front a class next to an IWB has a good view of learners, and is able to dedicate him or herself to them while pointing at images visible to all of them, as opposed to sitting by computer out of sight. The assertion that teaching from the front position alongside a board is a deeply rooted technique in education is said to lend support to teachers’ appreciation of this enormous advantage of an IWB, specifically to the ones who have an aversion to technology. Moreover, a teacher who
illustrates how an IWB functions, which programmes it encompasses, and how these can be used is copied by his or her learners who take notice of a teacher’s proceedings, and absorb new ICT skills (Smith et al., 2005, p. 94). On the other hand, when learners work with tablets that are IWB accessories and to which an IWB is connected, a teacher is likely to leave his or her prominent position, and to get closer to learners to monitor their learning. Hence, a teacher is no longer expected to teach from the front to be able to organise a class (Smith et al., 2005, p. 95). Teachers can “teach creatively – e.g. thanks to the multimedia content - and teach creativity”, so an IWB opens up plentiful possibilities for them, and can breathe new life into their teaching routines (Agostini et al., 2010, p. 274). It should come as no surprise that an IWB has an impact on teachers’ motivation which is increased by learners’ disposition towards obedience, and their excitement of an IWB, which inspires teachers to plan lessons with an IWB (SMART Technologies, 2004, p. 12). Motivation is further rooted in a massive quantity of teaching materials that teachers find on the Internet, or in being able to come up with their own. These materials are rewarding for teachers who are able to draw on them so as to explicate unfamiliar, complex matters effortlessly. Should any flaws in these materials be detected, they can be eliminated, or any adjustments can be made, and teachers can swap them with one another. Teachers can provide learners with online sources which learners can obtain quickly and refresh their memory of previous lessons conducted that year or during the preceding years. Next to teaching materials, teachers can check learners’ progress by devising tests which they can keep for future utilization (Giglioli, 2013, p. 13). Materials which appear during teaching can be copied and saved in an IWB, for which teachers will be thankful, as it is handy and lessens their workload. Furthermore, teaching will happen in a more natural way, teachers will be able to readily cope with various unplanned circumstances, and to adapt their teaching
to emerging needs or changing situations because they can count on a wide assortment of materials and online sources (BECTA, 2003, Key research evidence about interactive whiteboards, para. 3). Storing and handing out materials decreases the amount of daunting hours of lesson preparation, and as materials are piling up teachers can look back on what everything they did or did not manage to do after each lesson or year after year (Smith et al., 2005, p. 94). Teachers can file not just their materials but also learners’ papers, presentations, handouts and so on for the sake of learners in order to help them assess their learning in retrospect, and to give them feedback (Giglioli, 2013, p. 13). Thanks to operating an IWB by touching it, teaching is more impressive, and first and foremost it ensures smooth transitions from one activity to another, and thus speeds up the flow of a lesson (Smith et al., 2005, p. 93). What makes a contribution to the faster tempo of lessons is that teachers do not have to tediously take down and rub out notes anymore (Winzenried et al., 2010, p. 537). “The facility to flip back and forth between pages on an IWB screen” is something teachers can rely on to meet the needs of learners, their individual differences and even learners with special educational needs (Smith et al., 2005, p. 92). Given the fact that an IWB was designed not to complicate but to simplify things, it is a very convenient and straightforward device. Conversely, teaching by the agency of computers poses problems or makes teaching less comfortable (BECTA, 2003, Key research evidence about interactive whiteboards, para. 3). It may well be on account of growing interaction between a teacher and learners initiated by an IWB, and because of being able to get down elicited answers on the screen and share them with the whole class (Smith et al., 2005, p. 95). Computers being smaller are effective mechanisms for independent work not for whole class interaction, and they do not have the option of displaying “digital content” (Betcher & Lee, 2009, p. 3). Teachers assisted by an IWB get learners to interact with
one another, cooperate and engage in classroom activities, and foster an improved atmosphere (Türel & Johnson, 2012, p. 382). It is a teacher who should recognise hidden facets of an IWB to make lessons intriguing so as to “capture the attention and imagination of the students in pedagogically sound, creative ways” (Betcher & Lee, 2009, p. 8). Now it will be turned to the other side of the coin, and disadvantages of an IWB will be discussed.

5.3 Disadvantages

5.3.1 Learners

As with anything else, after an IWB has fallen into place, and teachers and learners have familiarised themselves with it, its magic may be lost (Smith et al., 2005, p. 96). When a teacher depends on an IWB to excess, and when at the same time he or she overexploits it in a teacher-centred lesson, an IWB may cause harm to learners’ “motivation, attention, and consequently, the efficiency of instruction” (Türel & Johnson, 2012, p. 382). The risks involved in so universally acclaimed interactivity and whole class’s engagement with an IWB can be the slower tempo of a lesson leading to irksomeness. Teachers should make careful decisions on classroom management because while small children feel elated at going to an IWB, adolescents may feel embarrassed and reluctant to stand up from their chairs. Touching an IWB might be troublesome and some learners may voice a complaint about it (Smith et al., 2005, p. 95). The speed of a lesson is determined by mechanical problems pertaining to recalibrating an IWB, sets of programmes on an IWB, or losing the Internet connection. Naturally, a lesson punctuated by dealing with complications makes learners impatient and angry (Giglioli, 2013, p. 14). Yazaki and Cross (2010) inform that recalibrating stands for “reprogramming the whiteboard interface so it responds accurately to touch”. The authors add that although a large screen of an IWB was positively evaluated, the
issue at stake is that when it is shiny outside, the sun’s rays cloud learners’ vision of images (p. 2). To prevent images on an IWB from being obscured precautions can be taken by drawing the blinds, getting rid of dust from a screen, or by choosing adequate colours and fonts (Smith et al., 2005, p. 98). Dostál (2009) implies that vision can be distorted by shadows thrown on an IWB, against which measures have been taken. What is more, if an IWB is fastened to the wall, it cannot be pulled up or down depending on learners’ height to ease their interaction (p. 15). Ergo, an IWB which is immovable makes it feasible for one learner to stand in front of it, and rules out the possibility of all learners’ cooperative work (Smith, et al., 2005, p. 96). Learners who are left out of touching a screen are susceptible to losing concentration and not participating in a lesson (Agostini et al., 2010, p. 275). Besides height or shadows, cables of an IWB may cause injuries, and therefore should be carefully tied and kept out of the way (Smith et al., 2005, p. 98). On the one hand, whole class interaction and speed in class has risen rapidly, on the other hand learners seem to be less separated into small groups. That is why some authors expressed concern for negative repercussions, and the worth of an IWB. When a teacher is more often in charge of the whole class, learners’ cognition has turned out to be prone to lacking depth. Likewise, when a chain of questions and answers passes between all participants more swiftly than it would in group work, interaction may be superficial as is learners’ cognition (Winzenried et al., 2010, p. 537). Learners may pool ideas, questions or answers, but they tend to contribute with one word utterances, succinct phrases or descriptions which do not suffice for profound self-expression. Learners, together with such quick turn-taking, the predominant whole class interaction and vast materials might struggle to link emerging concepts and thoughts to one another. They may get lost in an incessant input of information, and end up with “cognitive overload” hindering them from remembering
and singling out facts (Giglioli, 2013, p. 14). So, learners are liable to retain isolated, fragmented facts which are barely applicable, and their thinking may be confined to concrete not abstract one (Dostál, 2009, p. 15). As regards the multimedia and multi-sensory virtue of an IWB extolled as one of the advantages, its positive value has been reappraised. There is lack of evidence that “verbal and visual information” should be conveyed simultaneously, and that dynamic visuals should be favoured over static ones because presentation of a new piece of information by way of the former is allegedly simpler to be grasped (Smith et al., 2005, p. 97). Lately, it has transpired that representation of dynamic visuals will make no wonders for learners’ comprehension. It is rather contingent on what is being taught, as certain subject matter cannot be explained by static visuals, and cannot do without dynamic visuals in order to be grasped. And it is dependent on the combination of both visuals accompanied by the spoken word so as to stress relation between crucial principles and reject less essential ones. Apart from that, it has been questioned whether physical interaction bears fruit, and enriches learning processes, or whether it only promotes learners’ motivation, and concentration. To be able to fulfil the purpose of physical interaction, an image to be touched on a screen must have logical or precise relevance to the matter at hand, for instance “drawing lines and shapes in mathematics, so that there is a sense of direct manipulation pertinent to understanding the properties of a shape” (Smith et al., 2005, p. 97). Dostál (2009) goes so far as to say that learners can purposefully fool around with an IWB, for example they unplug it, with the aim of mocking a teacher (p. 15). It is precisely a teacher whose disadvantages will be moved on to.
5.4 Disadvantages

5.4.1 Teachers

Generally, an IWB has to be placed in every classroom at schools in order to be employed by teachers (BECTA, 2003, Explanation of findings, para. 8). Unfortunately, the reality is that maps, pictures, and traditional blackboards hang on walls of many classrooms, and IWBs are locked in separate rooms which are problematic for teachers to enter (Betcher & Lee, 2009, p. 4). Even if the door opened for teachers, and they could explore an IWB, they might get disheartened if they do not possess expertise in an IWB (Türel & Johnson, 2012, p. 382). On condition that teachers gain an insight into an IWB, learners make the most of it (Aytekin et al., 2012, p. 287). Even though an IWB being so user-friendly is not intellectually or technologically demanding, and many of its functions can be worked out by trial and error, it contains products or systems from the World Wide Web, which can put a strain on teachers who hesitate over how teaching could be harmonised with an IWB and all those programmes (Giglioli, 2013, p. 13-14). An IWB has been concluded to be a tool that can and will change teachers’ ways of teaching. Nevertheless, it is not an IWB that decides that a teacher modifies his or her teaching methods, but a teacher him or herself. Teachers have been found to be open to such changes, but their new teaching is most probably influenced by their creeds, and to what extent they are determined to apply new techniques to the betterment of learning. It would be wrong to jump to conclusions that teachers’ pedagogy will be affected alike (Winzenried, et al., 2010, p. 536-537). There are teachers who are not pro an IWB or technology in general. Some may argue that an IWB is a major step backwards, for a teacher teaches from the front and makes learners passive; an approach which was conventionalised years ago, and for which a blackboard has always been perfectly suited. If a teacher continues teaching on a spot in front of a
class, then an IWB is seen as a costly machine (Betcher & Lee, 2009, p. 7). Many authors call for urgent action to give teachers instructions, provide them with training courses, and advocate so far insufficient technical help without which teaching is threatened to be spoiled (Yazaki & Cross, 2010, p. 2). Teachers may be so overwhelmed by the functional capacity of an IWB that they forget about fusing teaching with an IWB, and remain preoccupied with how to operate this technological marvel. Instead of embracing the constructivist mode of teaching, mentioned in the previous chapters, teachers’ teaching with an IWB stagnates at the outmoded level of diffusing knowledge, and reinforcing passivity of their learners (Aytekin et al., 2012, p. 287). In connection with that, teachers draw up plans of their lessons in the long-time-ago-established fashion, and do not give learners permission to touch a screen (Agostini et al., 2010, p. 275). The constructivist and sociocultural approaches along with interactivity are occasionally encountered. As a matter of fact, it has come out that an IWB is used in the early stages of a lesson, or during pre-teaching activities for the whole class followed by individual or group work tasks during which interaction predominates; to put it another way, “the new technology appears to have been uncritically absorbed into teachers’ pre-IWB practice” (Smith et al., 2005, p. 96). If teachers think of an IWB as an apparatus that projects photographs, films or slides on a screen, they are seriously mistaken. To avoid these misunderstandings, it must be taken care of educating teachers who will find out that “the possibilities are almost endless” (Betcher & Lee, 2009, p. 8). Sometimes, teachers prefer practical application, experimenting or illustration to elucidate concepts, and textbooks (which should not be replaced altogether, and the importance of which cannot be undermined, as learners should be acquainted with working with a textual material) to an IWB. What should not be underplayed is the size of letters selected by teachers in their slides or materials.
projected on an IWB, for writing can be too small to be legible for learners sitting at the back of a classroom (Dostál, 2009, p. 15). As for the height of an IWB, teachers may not be able to reach the top of it when it is too high. And when an IWB is not firmly attached to the wall, its movement is not manageable with ease, and muddles up “the calibration” that needs to be repaired (Smith et al., 2005, p. 98). At last, teachers who have hoarded piles of materials during their carriers will have to face the prospect of hours of planning and preparing materials suitable for teaching with an IWB (Öz, 2014, p. 157). When a heap of new materials is built, an IWB awaking a flood of anticipation and eagerness on the part of learners can be unfortunate for teachers who will strive to perpetually embellish lessons and teaching materials as to sustain learners’ interest (BECTA, 2003, Explanation of findings, para. 7). It is estimated that teachers who will endure this hardship will not regret it, as it will pay off, and time will be saved in the future (Smith et al., 2005, p. 94). Being so expensive, an IWB must be proved to be a useful tool, and its success must be conspicuous otherwise many schools will not give consent for its purchase. It is not unusual for schools to buy cheaper devices on which teachers are keen as well (BECTA, 2003, Explanation of findings, para. 10). In the next chapter, beliefs of learners and teachers will be introduced, which are grounded on observations, research, practical and authentic usage of an IWB, and which will build a complete picture of how valuable an IWB really is.
6 Beliefs of teachers and learners

The final chapter will raise the subject of teachers and learners’ beliefs about an IWB. As mentioned in the previous chapter, an attempt will be made to draw the outline of their perceptions derived from international research so as to be able to compare those findings with the ones that will be gathered during the research at Czech schools. Similarly to the previous chapter, this one will be divided into two domains, learners and teachers. It is vital to point out that this topic is a relatively unexplored area lagging behind in research, and that attitudes presented in this paper have been collected from researchers who investigated into teachers and learners’ beliefs of all ages (mostly basic or secondary schools), and many school subjects, therefore opinions on an IWB will be approached from various angles, and generalizations made will be universal.

6.1 Learner beliefs

By and large, Öz (2014), whose study contributed particularly to the research on teachers and learners’ opinions in an EFL classroom, claims that the learners are very thrilled, excited and curious about having and exploring the potential of an IWB during English lessons (p. 165). Thus justice can be done to the wow factor, mentioned in the previous chapter, as an IWB is a tool that truly appeals to the learners who further speak highly of being able to browse the Internet, thanks to which they can look things up or see visual images (Orr, 2008, Results and discussion, para. 2). In Schmid’s research (2006), when the learners can decide on whether or not to increase the usage of an IWB during language lessons, they do not hesitate for a second to give their consent, for an IWB is a novelty, which they are eager to know inside out. The learners perceive an IWB as their own computer on which they can do the same things, but are fascinated by everything being enlarged on a big screen (p. 55-56). The learners’ mindset is
optimistic, but not stable, and depends on the level of English, and the amount of classes taught by means of an IWB. As for the former, feelings of the learners who are at lower levels oscillate and are dissimilar until they gain confidence in an IWB, whereas the initial elation of the learners who are at higher levels subsides. They learn how to manipulate an IWB, and since the learners can come to grips with it, they are convinced that they can handle it well, so their views on an IWB do not differ much. With regard to the latter, it can be inferred that the more frequent contact learners have with an IWB, the greater discrepancies are in learners’ impressions on an IWB (Öz, 2014, p. 172-173). The learners advocate an IWB because they can also show off what they have learnt via in their eyes so intriguing IWB. Unluckily, they are prevented a lot from working with an IWB by the teacher who manages classrooms in an outmoded fashion, that is, focuses on learners’ collaborating with one another in small groups or pairs while leaving an IWB off. But the learners wish to incorporate an IWB into whole class activities, or to be in charge of a lesson for a while, and thus it is them who identify the educational and essential purpose of an IWB. This completely contradicts to Winzenried et al. in the previous chapter, who maintain that interaction occurs more and dividing learners into groups less often (Schmid, 2006, p. 56-57). Nevertheless, Schmid’s finding is in accord with Öz (2014), who contends that the learners, not the teacher, judge an IWB to be the causal agent of useful, purposeful and effective interaction (p. 173). When determining the most enticing features of an IWB, the learners pick out a touch-sensitive screen, on which they move icons with the finger or a pen (Beeland, 2002, Results, para. 4). Wall, Higgins and Smith (2005), whose research was pursued among 10 to 11 year-old children, have ascertained that the learners are of the opinion that being allowed to touch an IWB on their own is the most profitable. The more they yearn to interact with an IWB, the more motivated they get, so their thirst for
physical interaction with an IWB is the reason for their motivation (p. 858-859). Furthermore, the learners’ motivation is considerably underlain by unveiling their versions of a task to other pupils on an IWB so as to disseminate their knowledge. The majority of learners are agreeable to standing in front of an IWB, as they hold that to be able to work with an IWB enlivens classes, sustains their motivation, and they remain attentive to educational materials. The author’s discovery is quite surprising because the learners in his research are 15-year-old, which is the age group casted doubt on over their unwillingness to go to an IWB by Smith in the previous chapter (Öz, 2014, p. 174). However, Glove and Miller (2001) uncover evidence that some learners undermine the capability of an IWB to motivate them. The learners see lessons as absorbing without an IWB, which is just an alternative to making subject matter plain, or a substitute for computers with which they are familiar (p. 265). Generally speaking, the learners discern how much they benefit from being taught by an IWB, as it is an audio and visual piece of equipment displaying pictures and playing sounds, they feel sure about acquiring deeper knowledge with ease. Since an IWB supplies the learners with a plethora of resources for studying they can drawn on, they are able to recall subject matter, and engrave it on their mind less laboriously (Öz, 2014, p. 173). In addition to that, Beeland (2002) has found out that next to the learners’ better apprehension of new concepts, they are more alert to the teacher’s presentation as opposed to a traditional monologue delivered with a blackboard behind his or her back during which the learners are liable to lose their concentration (Results, para. 6). Lessons are more lively, pleasing and comprehensible for the learners, and when they do not fathom something, they can ask the teacher to revisit that again (Glover & Miller, 2001a, p. 264). To be more precise, Orr (2008) emphasises that the teacher can come back to flipchart pages, which is noted and liked by fewer learners than predicted,
possibly because few teachers do it (Results and discussion, para. 8-9). An IWB is highly praised for playing games, which turns tiresome education into amusement; for a set of programmes which enables the learners to look at things from numerous perspectives and for visual materials. An IWB makes learning memorable, forms mental images that are perceptible by senses, which is favoured by the learners. It facilitates their mental processes, thinking about these processes (metacognition) and comprehension. The learners approve of the mode of transmitting knowledge by the teacher or pupils because information that is usually orally passed on can be illustrated on an IWB (Wall et al., 2005, p. 858). Beeland (2002) extends the scope of accounts pertaining chiefly to the visual side of an IWB to its audio one, and although the sample of learners’ answers is small, it still can be deduced that sound effects add to the learners’ enjoyment (Results, para. 9). What is positively appraised is the combination of images, teachers’ explanations and whole class participation in discussions, which all enhance learning or understanding. Yet, the remaining senses relating to touch and movement, even though evaluated in a positive light, are remarked upon by a low number of learners (Wall et al., 2005, p. 860-861). On the contrary, Beeland (2002) has received more extensive collection of responses in which the learners admit that it is touching an IWB that strengthens their comprehension or their learning with joy, except for one learner for whom nothing has changed (Results, para. 10). The learners acknowledge that an IWB quickens the tempo of lessons, and certain chores ordinarily associated with a blackboard, such as wiping the surface, cease to be done because the teacher can readily delete what is on a screen, or switch between pages (Orr, 2008, Results and discussions, para. 4). In relation to other subjects, the learners profit from working with an IWB during which they get a chance to practise ICT skills. In some cases, an IWB has reversed the learners’ negative judgements on subjects, such as
maths. What is more, the learners are open about teachers’ teaching which they regard as creative, energetic, and improved; and about other pupils with special needs, or conduct disorders whose problems they believe are reduced to minimum (Wall et al., 2005, p. 861-863). The disabled have been heard that they can learn to a greater degree, and their pace of learning is more rapid due to the interactive nature of an IWB, and a large screen making images visible and noticeable (Gregory, 2010, p. 33). To continue with learners reflecting on teachers, they aver that teachers knowing in advance they are going to teach with an IWB will have to set things up, and plan lessons thoroughly, therefore lessons should proceed smoothly (Glover & Miller, 2001a, p. 264). The learners are sensitive to the way the teacher manipulates an IWB, and affirm that the teacher might inaccurately estimate the speed of a lesson, and may flick through slides hastily. On occasion the teachers’ ICT skills are poor, which impedes progress of a lesson. The learners complain not just about teachers’ competence, but also about technological issues and grappling with an IWB. An IWB stops working, requires recalibration in class explained in the previous chapters, or consumes too much time in order to be turned on or off. From the learners’ point of view, an IWB can be easily damaged, and is so expensive that they would not mind giving up on it, for some of them can learn well from non-technological sources and teachers (Wall et al., 2005, p. 863-865). It is the other way round in Glover and Miller’s research (2001a). The teachers fear that there is a strong likelihood of an IWB not running properly, or that their lack of knowledge will spoil lessons, but the learners do not worry about that. They assert that technological failures occur rarely, and if they do, the teacher is able to carry on with a lesson. Even though they are forbidden to shout, the learners do so as soon as they spot the teacher’s struggling and are willing to lend a hand. One way or another, the learners argue that without an IWB they could not take in as much as they
can with it (p. 268-269). Orr (2008) discloses that the learners condemn an IWB as complex or troublesome, and indicate that their interaction with an IWB is hampered by the teacher (Results and discussion, para. 13). Likewise, Wall et al. (2005) discovered that the learners are dissatisfied because they cannot touch an IWB as much as they would like to, hence they view this restriction as a barrier not enabling them to determine how an IWB could aid their learning (p. 864). Beeland (2002) elaborates on Orr’s statement about the complexity of an IWB mentioned above, and specifies that the learners find it disturbing when other pupils accidentally bang into an IWB, or any part of it, which has to be aligned again. In spite of the findings of so much wanted interactivity, the learners encounter trouble with writing on an IWB during which their hand creates an obstacle and a shadow appears on a screen; and with pens thanks to which they smudge a screen accidentally, or they stain it with their arms. The learners cannot read what is written on a screen if word processing is on, and are concerned with cables scattered on the floor (Results, para. 5). Apart from the cables, the learners fret about their welfare, for an IWB can trigger “headaches, sore eyes, and epileptic fits” (Wall, 2005, p. 865). Surprisingly, almost no use is made of printing out materials for the learners who would like to be provided with them. Behind this can be a remote possibility of printing materials, or teachers think that learners will get by with their notes, especially if materials are dashed off for that particular lesson only (Orr, 2008, Results and discussion, para. 15). Another teachers’ explication is that they refrain from copying materials for learners because of printing being costly (Glover & Miller, 2001a, p. 262). In sum, the learners arrive at conclusions that an IWB provides an incentive to study, to be involved in activities, to conduct themselves impeccably and to apprehend and remember facts (Aytekin et al., 2012, p. 292). Finally, according to Öz (2014), the usage of an IWB has made much more favourable impression on teachers than on
learners. Those learners and teachers who strongly support the notion of an IWB use it in terms of hours to the same extent, therefore how much time is devoted to working with an IWB is crucial, and it makes the difference (p. 174).

6.2 Teacher beliefs

As well as learners, teachers embrace an IWB enthusiastically, for example in Gregory’s (2010) article, the teachers and learners would be utterly saddened if they had to give up on an IWB (p. 32). The teachers in Glover and Miller (2001a) are conscious of the educational power of an IWB, and are ready to evolve and adopt new teaching and learning strategies (p. 270). Orr (2008) writes that the teachers and learners show excitement and interest, and learners who are into technology admire teachers when teaching with an IWB (Conclusions, para. 1). As far as much discussed pedagogic change in the previous chapters is concerned, one of the teachers describes step by step how he has worked his way through teaching with an IWB. When the teacher introspected his own teaching with an IWB, it has turned out to be proof that teaching does not stay stable, but undergoes a change. His description of his gradual development of teaching with an IWB corresponds with the three stages: doing old things in old ways, doing old things in new ways and doing new things in new ways, mentioned by the authors in the previous chapters (Betcher & Lee, 2009, p. 54). Nonetheless, in Glover and Miller’s article (2001a), it has come to light that a minimum number of teachers demonstrate their technical prowess, and determination to make the most of an IWB. They are missioners, mentioned in the previous chapters, who are enthusiastic about moving on in their teaching methods. The majority of teachers fall into the category of tentatives, who have given an IWB a try. They show signs of being amenable to an IWB and intrigued to learn how to operate it, but being so uncertain about an IWB or themselves, they do not use it in all lessons in which there is a notable
absence of interactivity. Three out of forty-six teachers are recognised as luddites, who are dismissive of an IWB and scornful of any changes (p. 272-273). Approximately 50% of teachers questioned by Türel and Johnson (2012) declare that the mode of their instructing learners has been altered, which implies pedagogic change, too (p. 390). The teachers highlight that to give instructions via an IWB saves time, refines classroom management, enhances interactivity, and makes it feasible to produce more visual teaching and learning materials (p. 387-388). With reference to Winzenried et al. (2010), the teachers have a tendency to judge their teaching harshly, and they are favourably disposed towards the idea of developing their teaching techniques connected to an IWB (p. 548). Another teacher realises that an IWB together with suitable teaching methods can encourage outstanding achievements. When witnessing what a tremendous impact an IWB has had on his learners, it prompted him to make every effort to get the most out of an IWB, and to “teach in a new way” (SMART technologies, 2004, p. 10-11). Ergo, Betcher and Lee’s affirmation (2009) from the previous chapters that teaching with an IWB principally concerns “pedagogy, not technology” is right (p. 54), but far from the only truth. The authors have unearthed that some teachers observing their colleagues are not afraid to emphasise that many of them have absolutely no inkling of what unique qualities an IWB possesses. This suggests that some teachers have and some have not reached the more advanced level, and that they should have room to go through the three stages (p. 56-57). In quite a recent study by Aytekin et al. (2012), it has transpired that the teachers use an IWB as a blackboard for writing on its surface and prepare slide show presentations in PowerPoint. The teachers still do not include learners in interacting with an IWB, which is an obvious sign that teachers are in the need of training in order to be able to exploit the versatility of an IWB (p. 291-292). Yet, Türel and Johnson (2012) report that a lot of teachers attend teaching courses
offered by their school they teach at or by a firm from which IWBs are bought (p. 389). It should be stressed that despite the fact that the teachers of English in Öz’s (2014) investigation have been present at courses arranged by suppliers of IWBs, they are none the wiser, and confess that they take advantage of seminars at which they obtain books that come in handy (p. 172). Some teachers seek advice from other members of staff, and a few try to familiarise themselves with an IWB on their own. The teachers do not demand that they are instructed in where to search for or how to create teaching materials because they probably find that out for themselves, but some of them would be grateful for being educated about “IWB technical knowledge and skills; teaching methods related to IWB; and designing IWB activities” (Türel & Johnson, p. 389-390). Glover and Miller (2001a) maintain that nearly the entire staff are trained because the school is oriented towards an IWB, but for example, educating on a particular subject falls behind with general courses on an IWB. After the first training sessions, the teachers’ enthusiasm dampens, and they start doubting their abilities that cannot equal those children have, or they can imagine how many hours of practising it will take them before they will master an IWB. Fortunately, the teachers guide each other through the system of an IWB, and do not refuse to share their knowledge (p. 261). Winzeried et al. (2010) agree, and point out that the teachers insist on, but do not fuss about training courses because they have an intuition they can rely on one another and on themselves, as they learn in the process. The teachers let their learners make a recommendation to them, and although they might feel intimidated now and then, they generally like being advised by learners (p. 548). What is a major hindrance to teaching with an IWB is that the teachers do fret about being incompetent, or too busy not being able to work on building up expertise in an IWB and producing materials. On top of that, to utilise multimedia is challenging and calls for special assistance. The teachers do not have faith
in themselves, and the threat of a breakdown of an IWB distresses them (Glover & Miller, 2001a, p. 268). Not surprisingly, the teachers want to have unlimited access to technical support and training because they do not wish to misuse an IWB as a tool for having fun, but for a decent standard of teaching (Öz, 2014, p. 172). One of the recurrent themes repeated by the teachers is learners’ engagement, for example, the teachers are sanguine about an IWB, and this strong sentiment does not diminish throughout a longer period of time, but is reinforced by learners being able to partake in class (Winzenried et al., 2010, p. 546). The teachers have made observations about engagement that stems from students touching a screen; all participants being less reluctant to interact with and react to one another; whole class discussions; teachers’ direct contact with learners that is otherwise broken when teachers are hidden behind computers; giving and collecting feedback to and from individuals or the whole group, which leads to diagnosing learners’ weaknesses and strengths or assessing learners’ improvement, and results in lessons proceeding at a faster rate and generating a cheerful atmosphere (SMART technologies, 2004, 6-7). Moreover, engagement manifests in learners’ keenness to produce PowerPoint presentations because it feels like being a teacher. They desire to amaze their peers, compete with them for the best performance, and familiarity with an IWB. They appear to be prepared to listen and make comments on their peers’ presentations (Glover & Miller, 2001a, p. 265). The teachers are certain that their learners are drawn in teaching and learning processes because of all senses (above all visibility) being heightened. Learners love going to an IWB to interact with it, and it is beneficial for learners who underperform (Beeland, 2002, Results, para. 14). According to the teacher in the study by Betcher and Lee (2009), saving work is absolutely superb, but subordinate to engagement and the practicability of attending to learners’ needs, and different learning styles (p. 55), which will be detailed before
storing materials. Glover and Miller (2001a) specify that tending to learning styles is
down to a better way of presenting subject matter; the multimedia capacity of an IWB;
and training of teachers who being self-possessed and armed with new abilities can
cater to and “prompt multiple intelligences and alternative learning styles in any one
lesson” (p. 262), and who ponder on effects of their teaching (p. 263). The teachers are
mindful of learners who have different learning styles which they know are all covered
when using an IWB (Beeland, 2002, Results, para. 16). The teachers notice that if
learners’ styles are recognised and targeted, learners are involved in learning and can
fully or more easily comprehend what is being taught. Learners with special needs pay
attention, and become proud of themselves and their skills when, for example, creating
their own presentations. In general, they are more obedient and composed (SMART
Technologies, 2004, p. 9-10). In Gregory’s report (2010), the teacher adds that an IWB
impacting on all senses makes learners engrossed in a lecture which teachers can
facilitate by combining their speech with writing and images. The author moves on to
behaviour management, for another teacher speaks about unruly, wilful learners whose
disobedience has been reversed due to an IWB. The teacher ascribes obedience to an
IWB because the learners who used to skip classes do not do it again, as they look
forward to lessons taught with an IWB at the teacher’s side, and are interested in what a
lesson will be like (p. 33). However, it is not true that learners would stop misbehaving
altogether, but the teachers can sense that they are more manageable (Winzenried, 2010,
p. 545). Besides engagement and learning styles, the teachers take pleasure in watching
their students being motivated, concentrated and involved (Öz, 2014, p. 172). Another
key word is then motivation that seems to play a pivotal role in a lot of aspects. The
teachers expand on how much their learners keep their mind on the task in hand longer;
on them imitating demeanour of peers they look up to; or on their increased school
attendance. Learners begin to be self-assured when they can take on the role of a teacher, and impart knowledge with the help of an IWB. Timid pupils who normally do not summon the courage to say anything aloud express themselves voluntarily. The teachers reiterate that learners are committed, passionate, memorise and sink in subject matter quickly and without considerable difficulty (SMART technologies, 2004, p. 7-8). The teachers reason that learners who live in the technological era will be thankful for an IWB, which the teachers foresee will be indispensable at schools (Yazaki & Cross, 2010, p. 4). In fact, the teachers expound on learners being motivated because an IWB is considered as being fashionable, contemporary mirroring their way of life. One of the English teachers says that an IWB is given preference by learners who do not revel in books. The teachers predominantly attribute motivation to the capability of an IWB to captivate learners by all kinds of programs it is equipped with, and its “high-quality presentations” (Glover & Miller, 2001a, p. 264-265). At elementary school, younger learners’ motivation is stimulated and regulated by the teachers who, for instance, like playing music on YouTube while learners are completing tasks, or who give learners permission to play games and have fun in return for their accomplishments or good behaviour. This is not so common among learners at secondary school where the teachers concentrate on content, which is evident in one of the teachers’ preference for PowerPoint (Winzenried et al. 2010, p. 544-555). Furthermore, the teachers extol the technical and visual virtues of an IWB, as they can instruct the whole group of learners what to do, and can choose from multimedia products that all learners will be able to see on a big screen (Yazaki & Cross, 2010, p. 4). They conclude that they gradually become skilful at the usage of an IWB, and have to persist in broadening their horizons because an IWB is helpful in giving directions to learners in any subject and any subject matter, and the teachers can afford to vary in the manner of their instructions (Türel & Johnson,
2012, p. 391). The teachers are fond of an IWB adding variety to giving instructions by way of “the Internet and interactive software, as well as video and sound”, and appreciate the merit of being able to store and reuse materials that emerge during a lesson (Beeland, 2002, Results, Para. 12). Notwithstanding this valuable asset, it is often underused, which is wrong because those teachers who store materials are aware of being able to reopen or modify (alternatively in collaboration with other teachers) saved notes for succeeding groups of learner, or to reflect on their teaching. Materials can serve as a jumping-off point for future planning, and all teachers can upload them into a school file to be utilised by their colleagues. Even though the teachers accept sharing without question, they are indisposed to availing themselves of this opportunity to use materials, as they hold a personal conviction that they would not do their job carefully or up to standard (Glover & Miller, 2001a, p. 263). The issue of teaching materials is closely linked to teachers’ preparation which an IWB compresses into a short space of time, makes their teaching adaptable and keeps a class under control, for teachers can pre-type notes, or type while facing learners and speaking to them (Winzenried et al., 2010, p. 544). A few teachers are not as busy preparing their lesson plans and copying or creating materials as before. Some already keep work done on an IWB during a lesson for future. The general consensus is that, in the long term, to be able to store, revise materials would really save a lot of time and help avoid making copies. An IWB inspires the teachers to come up with tasks for the whole class, and it is an organisational device that perfects their organising of lessons (SMART Technologies, 2004, p. 12). This is confirmed by the teachers in Glover and Miller’s survey (2001a), who state that an IWB makes their lessons precisely organised and carried out according to a plan (p. 262). Apart from the preparation time, an IWB affects the mode of teachers’ planning. The teachers are partial to looking for new and extra sources, and
they do not regret their initial wasting of time, as it decreases owing to cooperation and sharing with other teachers, and recycling or going back to materials from the previous lessons or years, which is widely complimented (Winzenried et al., 2010, p. 547). At last, the teachers bring up the matter of shadows of their hands thrown on a screen when writing owing to a projector emitting light, and it irritates them when they cannot repair technological problems (Beeland, 2002, Results, para. 13). To sum up, the teachers in Gregory’s paper (2010) do not query whether an IWB aids the process of learning, quite the contrary they are convinced that an IWB boosts it and deepens learners’ understanding (p. 33).
7 Research Methodology

In this chapter the research findings will be revealed, and research methodology will be introduced. The aim is to present two major issues: teachers and learners’ beliefs about an IWB and its use, discussed in the first part, but which are confined to Czech education. The research can be said to be both qualitative and quantitative, as it comprised two parts: the distribution of questionnaires about teachers and learners’ perceptions of an IWB, and observations done in class. The questionnaires for the learners contained 12 statements to which a scale of 6 items ranging from totally agree to totally disagree was given to be ticked, and three open-ended questions. The questionnaires were translated into Czech as opposed to an English version for the teachers, which had got 17 statements with the same agree-disagree scale, and three open-ended questions. Both versions of the questionnaires are attached in the appendices 11.1 and 11.2. The observations were done without disclosing to the teachers the purpose of them so as not to influence their teaching, and thus to remain as objective as possible. The ultimate goal was to ascertain how the teachers utilise the IWB in English lessons, and to get answers to the following questions grounded on the first part:

- Can physical and intellectual interactivity be observed?
- Can the teachers and the learners manipulate the IWB without difficulty?
- How the teachers use the IWB?
- Which activities are the most common?
- Are the teachers and the learners enthusiastic about the IWB?

Consequently, this part of the paper will be divided into two main chapters. The first one will separately introduce the results of the observations done at each school
and their subsequent comparison with one another and with the first part. The second one will analyse the data obtained from the questionnaires followed by comparing the schools, the two age categories of learners and the first part, too. Finally, the paper will be ended with giving advice, or with making suggestions for future years and development. Before embarking on the analysis of the observations, an overview of the participants, the location and the problems that were run into will be provided.

Subjects

- **Learners:**

As it was described in the previous chapters, the focal point of the paper is younger students at the age of 10-15 as well as older learners at the age of 15-19. The younger learners in this research attended the lower stages of grammar school that overlap with basic schools, and the older learners attended the higher stages of grammar school.

- **Teachers:**

There were 20 teachers observed, but two teachers in Plzeň were present only at the beginning of the observations, and one teacher in Brno refused to collaborate, and thus only two lessons taught by the three were witnessed.

  - **Teachers in Brno:**

The number of teachers: 10 (including the teacher who did not wish to be observed)

Female: 7

Male: 3

3 female teachers were at their early 30s, and will be designated as T1-T3.

2 male teachers at their 30s will be T4 and T5.

The male teacher at his late 30s will be T6.
The female teachers at their 40s and 50s will be T7-T10 (the higher the number assigned to the teacher, the higher the age).

- **Teachers in Plzeň:**

  The number of teachers: 10 teachers (including the two who were later absent)
  Female: 9
  Male: 1
  
  T11 and T12 will stand for the youngest female teachers at their early 30s.
  T13-T18 will denote the female teachers at their 30s and 40s (the higher the number assigned to the teacher, the higher the age).
  T19 will signify the oldest female teacher at her late 50s.
  T20 will be the male teacher at his 30s.

**Location**

The research was undertaken in Brno and Plzeň at grammar schools.

**Issues encountered**

It should be pointed out that several principals of Czech schools in Brno had been contacted so as to inquire whether the research could be carried out in them. It was a rather disappointing and disconcerting process, as the headmasters rejected to collaborate because their schools were not equipped with IWBs, or if they were, they did not use them in English lessons. This indicates the slow progress of Czech schools towards modernisation of the educational system that falls behind with the one in foreign countries, such as the USA, England, Canada and Australia mentioned in the previous chapters as the nations from where the notion of an IWB has started to spread to the rest of the world. After a few unsuccessful and unsettling attempts to find a suitable school, one of the grammar schools agreed on collaboration although without
guaranteeing that the teachers were going to use the IWB. It turned out that the teachers really did not make frequent use of the IWB, and therefore it was decided to carry on with the research in Plzeň in order to find out whether the situation was going to be different. Similarly, searching for schools available for the research was troublesome for the same reasons as in Brno, but in the end two grammar schools were willing to cooperate, and the one better equipped was chosen.

7.1 Observations

7.1.1 Grammar School Brno

The total number of classes observed in Brno was 47, out of which 26 lessons were observed at lower and 21 at higher stages of the grammar school. To be more precise, the IWB was turned off in 16 classes, including the lessons in which the teachers wrote on it as on a traditional board. The school was equipped with four special classrooms in which computers and four IWBs had been installed. It meant that the teachers did not have regular access to the IWBs, and only some of their lessons were scheduled a few times a week in those classrooms, which could be one of the reasons why the teachers gave lectures most of the time without using the IWB, as mentioned above. In the majority of cases the lessons were delivered in the traditional mode of teaching with textbooks, handouts, sometimes computers and note-writing on the surface of a switched-off IWB, for no blackboards were in those classrooms. In fact, all teachers wrote on the IWB as if it were a traditional board, but one of the teachers said that they did not like writing on the IWB because it was difficult to wipe notes from it. It might have been problematic because she wiped notes with tissues instead of the eraser. It seems even pointless to try to make a distinction between the teachers who taught the younger or the older learners because it can be argued that each teacher had developed their preferred ways of using the IWB regardless of the age group of their
learners. If the teachers made a decision to turn the IWB on, one of the programmes they opened was ActiveInspire. This was nothing else than a white sheet of paper on which the teachers wrote words or notes for their learners, so it was like writing on a traditional board, except the IWB was its shining electric equivalent. One of the teachers (T4) let his learners go to the IWB to write answers to some exercises with the pen, after which there was a discussion in pairs and whole class feedback via the IWB, on which the learners could see all the words connected to the exercise. T4 wrote grammar on the IWB, but squeezed the words at the top of the sheet commenting: “I love this computer writing”. Writing on the IWB with the pen caused him considerable difficulty, but it was still visible and legible enough. He was definitely not the only one who struggled with writing with the pen, as T7 made a remark “something is wrong with the pen”. In another situation T1 gave up on writing, for the pen did not work at all, which she had already encountered. She said that one day “the pen didn’t work properly and wrote only when it was 1 cm far from the board”. T1 also used ActiveInspire, in which she underlined or highlighted the notes with colours, wrote the instructions for the next activities, and switched between the sheets of paper to conceal something that was yet to come. She and many other teachers played listening tasks via the IWB, and stayed in charge of operating it. Once the teacher (T8) wanted to write on the IWB, but could not find the pen, so she said: “I’d have to switch on the computer, and I don’t want to”. With two exceptions, when she played a song on the Internet and wrote notes in Microsoft Word, she never incorporated the IWB in her lessons. T9 and T10, who taught only the younger learners, always opted for Microsoft Word to type notes for the learners at their computer. Several teachers opened the Internet in order to watch a film or a serial; browse web pages they wanted their learners to find on their PCs; watch YouTube videos as a warm-up activity for whole-class discussion; or play
an educational video which the learners translated into Czech and repeated the sentences, which was a good example of the whole class interactivity. Only T5 favoured Microsoft Paint for writing notes over ActiveInspire or Microsoft Word, and he also involved the younger learners in the usage of the IWB by setting them PowerPoint presentations which they presented in class. Those were all instances of the usage of the IWBs, and the last thing which should be briefly touched upon is sunlight which made the notes on the IWB barely visible during two lessons, but the curtains were pulled down to resolve the problem.

7.1.2 Grammar school Plzeň

The amount of classes observed at the school in Plzeň was 39, out of which 19 lessons were observed at lower and 20 lessons at higher stages of the grammar school. In addition, the IWB was off in 20 lessons, including those in which the teachers wrote on it as on a traditional board. By contrast to the school in Brno and to the schools in the CR in general, in this grammar school the IWB had been installed in all classrooms. In the common classrooms, the IWBs could not be touched with the finger, but each teacher owned a special pen that he or she had to bring to a lesson. These IWBs looked like a traditional board, which could be closed so as to write notes on them, or unfurled and project things on the middle part with space left on the left and right wings for writing notes. There were two special classrooms, in which next to the IWBs being able to be touched with the finger the traditional boards had been placed, too. It might be expected that the teachers having unlimited access to the IWBs would use them to a larger extent than in Brno, but such conception has to be refuted, for the teachers did not make the most of the IWBs at all. It may have been because the IWBs became a part of the school quite recently, and the teachers complained about their improper functioning.
Likewise, no matter of the age of their learners, a certain pattern of the way of using the IWB by the teachers could have been discerned.

To start with, the first lecture witnessed was the most surprising, possibly the most exemplary, and at that moment the situation looked much more promising. What T11 did was that she included the older learners into the whole class activity, and into touching the IWB. The class played a game in the programme called Kahoot, to which the learners connected with their mobile phones or tablets. Their nicknames appeared on the IWB, and the learners were quizzed on grammar. Although some learners now and then remarked something upon the quiz, they were engaged in the game, paid attention, and gave the overall impression of enjoying it. After finishing the game and working with the textbooks, T11 started a new game that required the learners to go to the IWB one at a time and drag expressions to their relevant categories. In that activity no learner was left out, but during the last game only one learner stood in front of the IWB and solved a crossword while the rest either sat silently or sometimes helped him. Later that day the class of younger learners eagerly asked for a game in Kahoot, and while T17 checked the outcome of discussions in pairs, the learner was getting the game ready at the computer. Unfortunately, the password was needed to get into the system, but T17 could not remember it, so to the learners’ disappointment the game could not be played.

On the basis of two more lessons in which the learners completed the quizzes in Kahoot can be reasoned that they were fun and definitely enjoyable for all age categories. The younger and the older learners were not fiddling about, but were intent on the games, and they truly revelled in them. Only one teacher (T13) inserted a DVD that was supplied with the textbooks into the computer, and regularly projected the older learners’ textbook on the IWB. T13 underlined important words for the learners, added a few more expressions for them with the pen, and prepared the learners for discussions.
in pairs. She manipulated the IWB with her hand, but found it easier to scroll up and down the pages of the textbook with the mouse on the computer. In another lesson on practising the English sounds, she let two learners cross out the inapplicable sounds with the pen. She told the class to feel free to make any changes if they were not content with the answers, but nobody would say anything or move, so she checked the answers with the whole class. When T13 wanted to erase the answers, she could not and did not know how to do it. Some learners advised her on what to do, and after a while she came to grips with it. T13 continued with the textbook in the next lesson with the same group of learners, who were supposed to read an article for two minutes that she measured by setting a timer on the IWB. The timer was the part of the DVD programme for projecting the textbook as were, for example, a column at the side of the textbook into which she wrote notes and a table of options for changing functions of the pen from a writing tool to a rubber and so on. It is noteworthy that T13 allowed the older learners to go individually to the IWB to fill in gaps in an exercise in the textbook. After the first round, she encouraged the learners to make corrections if they spotted any mistakes. This time T13 succeeded in making the students cooperative, and some of them corrected the mistakes without hesitation. Afterwards, she showed them a title of an article about which they talked about in pairs. There was a very impressive and memorable lesson conducted by T15 for the older students. She created a PowerPoint presentation on New Zealand that consisted of a map and pictures of distinctive things connected to the country, so that the learners could imagine them better. The presentation was accompanied by YouTube videos, which enlivened the lesson; and by the teacher’s writing down keywords on the wing of the IWB. The video the learners watched served as a warm-up for the whole class discussion. What should not be overlooked is the fact that T15 endeavoured to interrupt the presentation as to open the
Internet, but she did not know how to do it, and so turned to the students for help who did it for her. Since the Internet was brought up, it should be stressed that the teachers used it as the source of information, for example Wikipedia, or for displaying pictures of unfamiliar objects. For instance, the younger learners looked at the pictures in Google and practised vocabulary; or they were split into pairs and took turns in describing the pictures while one learner faced the IWB and the other one sat with his or her back to it. The pair work was followed by the whole class discussion about the pictures. Furthermore, two older learners delivered their PowerPoint presentations, and one of them combined his presentation with Google pictures and the Internet, which were intended to draw all members of the class in. After one of the presentations, T17 used a DVD to project the map of London sights, about which the learners read information, and to which she pointed on the screen. For the rest of the lesson the learners watched a documentary about the city. When it happened that T19 had to fill in for her colleague and the class was joined together, she played a sitcom for the learners as it was the easiest way out of handling the class of 30 pupils. Two last remaining instances of using the IWB were typing notes in Microsoft Word and writing on the surface of the IWB as on a traditional board.

7.1.3 Comparison

Notwithstanding the degree of accessibility or the level of equipment, it can be announced that the teachers at both schools did not devote much energy and time to integrate the IWB into their teaching. Irrespective of the learners’ age, each teacher had devised his or her teaching strategy with the IWB, and there were almost no differences between the schools. The initial questions listed above can be now answered.

The most repeated teaching techniques and the common denominators of both schools were undeniably writing on the IWB as if it were a traditional board; selecting
Microsoft Word for typing notes; using the Internet, YouTube videos, websites as the source of information, online exercises or giving a demonstration of teaching and learning material. Additionally, the typical programme of the school in Brno was ActiveInspire for note-writing, and in Plzeň the programme Kahoot for playing games. The teachers in Brno let their learners watch films or sitcoms often at the end of the week so as to slow down and rest, which was not observed in Plzeň. It was not unusual to hear PowerPoint presentations produced by the students rather than by the teachers at both schools; but in Brno they were delivered by the younger learners, whereas in Plzeň by the older learners. It was only once by T15 in Plzeň, who herself made her own PowerPoint presentation. It was evident that the teachers very rarely let the learners interact with the IWB, and it was always the teachers who manipulated it; apart from the presentations and the four instances in Plzeň and the one in Brno mentioned above.

When the teachers operated the IWB, they encountered problems with the pen, which in Brno did not react. In Plzeň, the teachers did not know certain functions and lacked knowledge, but the students knowing more than the teachers did readily aided them. Broadly speaking, the classroom arrangement was not substantially affected by the presence of the IWBs. Some traces of the whole class discussions were detected twice in Brno and three times in Plzeň, but there was no significant learners’ involvement that could be spoken of. To sum up, the rare occurrence of the usage of the IWB implied the teachers were not ardent users, and as a result the learners were not given much chance to be enthusiastic about it. The potential of the IWB was surely not exploited to the full.

With reference to first part of the paper, many authors addressed the issue of pedagogic change, which necessitates giving way to teaching in an unconventional, original or innovative manner. On top of that, they distinguished three stages teachers pass through, and the corresponding three categories of them. Regrettably, the teachers
at the Czech schools adhered to old conventions of teaching, and entered the first stage of working with the IWB, for the IWB was a traditional board counterpart; or maybe the second stage, as some of them initiated whole class discussions, or at least used some programmes or the Internet. The teachers were on the borderline between luddites and tentatives, who attended training courses, and had access to the IWBs. The former carried on teaching in an established fashion, and could not see the point of using the IWB, the latter gave the IWB a try, but what might have hindered them from using the IWB was time consuming preparations or technological glitches, which some of them confessed after divulging the aim of the observations to them; but more details should be disclosed by the questionnaires. Such finding coincides with one research introduced in the first part in which most teachers belonged among tentatives. Further aspects of the observations which are analogous with the first part are that the teachers neglected to teach with the IWB; did not give the learners permission to operate it; used the IWB as a traditional board; grappled with technological problems; and did not appear to create, store and share teaching and learning materials with their colleagues. Needless to say, they did not print out any materials for their learners, or saved the pupils’ work. Last but not least, when the sun was shining during two lessons in Brno, it made the screen barely perceptible, but measures had been taken at both schools against the sunshine. In contrast to the first part, the claim that the IWB has to be in every classroom to be utilised on a daily basis must be denied. Despite the fact that each classroom had been furnished with the IWB in Plzeň, it did not impact upon the frequency of usage by the teachers. On the grounds of the first part, it was anticipated that the teachers were going to prepare PowerPoint presentations, but the programmes for writing notes (Microsoft Word/Paint or ActiveInspire) predominated. In conclusion, contrary to the first part, it can be asserted that the teachers and the learners at the
schools did not exhibit any noticeable signs of being excited about the IWB because the teachers did not make an extra effort to explore and teach with the IWB, and so unsurprisingly the learners having almost no experience could not be keen on it either. The questionnaires, which will be examined in the next chapter, should clarify further points that could have not been observed in class.
8 Questionnaires

In the following analysis of the questionnaires, the votes for the degrees of agreement and the degrees of disagreement are counted together so as to condense six items into agree-disagree scale, and to reach the total number of all the learners and the teachers, who were either inclined to agree or disagree. The tables of the analysis of the questionnaires are enclosed in the appendix 11.3.

8.1 Grammar school Brno

8.1.1 Learners

The amount of questionnaires distributed among the learners at school in Brno was 145, out of which 75 were received from the younger learners, and 70 from the older learners. The learners were given the opportunity to express their agreement or disagreement with twelve statements about the IWB. The learners markedly differed on three of them, and concurred with nine.

Firstly, the answers obtained to the assertion that the IWB motivates learners to learn were not so straightforward, as the younger learners agreed and the older learners disagreed, as illustrated in figures 1 and 2.
Secondly, while the younger learners agreed that the whole class was involved in teaching and learning process without being divided into pairs or small groups when working with the IWB, the older learners disagreed, as illustrated in figures 3 and 4.
Figure 3. When working with the IWB, the whole class is involved. The figure illustrates the younger learners’ agreement.

Figure 4. When working with the IWB, the whole class is involved. The figure illustrates the older learners’ disagreement.

Thirdly, the younger learners agreed with achieving more successful learning outcomes in the English language due to the IWB, but the older learners disagreed, which is illustrated in figures 5 and 6.
By and large, quite an optimistic interpretation can be derived from all the learners’ voicing favourable opinions on nine statements. It can be inferred that the IWB was regarded as a tool which improved lessons (especially by the younger learners whose view was slightly stronger than that of the older ones); helped remember subject matter better; increased the learners’ concentration on the teacher’s talk; included the

Figure 5. I achieve more successful learning outcomes in the English language due to the IWB. The figure shows the younger learners’ agreement.

Figure 6. I achieve more successful learning outcomes in the English language due to the IWB. The figure shows the older learners’ disagreement.
individual in activities; and which the learners wanted to touch. To give presentations by means of the IWB was totally agreed by the younger learners, and was more moderately agreed by the older learners. The learners concurred with the opinion on the teacher letting them touch the IWB, and their learning being reinforced if they manipulated the IWB on their own. Most importantly, the younger and older learners agreed with using the IWB every time their English lessons took place because it facilitated learning. The analysis of the learners’ open-ended questions should shed light on these findings and the matter in question. The learners were asked why they liked and disliked teaching and learning processes with the IWB, and in the third question they were encouraged to add whatever that would cross their mind, and the questionnaire possibly left out. It should be stressed that not all the learners contributed to the questions, which lowered the number of questionnaires. 74 younger and 59 older learners expressed their liking for the IWB, whereas 61 younger and 56 older learners expressed their dislike. The percentage of the learners was calculated from this amount of questionnaires.

The most common comments made by 49% of the younger and 31% of the older learners were on enumerating the functions of the IWB, which enabled them to watch films, videos, documentaries; look at pictures, (PowerPoint) presentations, blank maps; listen to songs; play games; draw; do interesting exercises; or connect to the Internet, on which information could be looked up besides the textbook. Additionally, the teacher could show various things. Closely connected to the functions was the entertaining feature of the IWB, which made lessons interesting and brought fun, according to 26% of the younger and 37% of the older learners. Some younger learners specified that lessons were more peaceful and not so ordinary. Moreover, the IWB being multifunctional offered more ways to learn something, and opened up an opportunity to
present projects. The older learners were of the opinion that the IWB was something new and interactive that included all learners in class; relieved the tedium of lessons; or broke the normal routine of looking into textbooks. 20% of the older learners praised the IWB for being state-of-the-art technology initiating fresh teaching methods and being close to their generation. 14% of the younger and 17% of the older learners underlined that there was no need to wipe the IWB, or to use a piece of chalk that used to cause mess, which made it a practical alternative to a traditional board. One younger learner aptly put it: “When I have a special pen, I click and that’s it”. Six younger students reported that it was easier to write on the surface of the IWB, and generally to work with it. Seven older learners briefly adverted to the visual aspect of the IWB thanks to which they remembered more, or could see what the teacher was talking about. A few younger learners claimed that the IWB was modern, and therefore suitable. It was clearly visible, everyone could see it, and they could remember well teaching and learning materials. Some learners made a reference to better concentration, imagination, comprehension, legibility, and two students did no care. The other side of the coin is that 36% of the younger and 20% of the older learners did not come up with anything they disapproved of, and it was reiterated many times that they did not mind the IWB. 21% of the younger and 13% of the older students complained that the IWB either had a harmful effect on their sight, their eyes hurt, it shone too much, or they had a headache. 13% of the younger and 20% of the older students were dissatisfied with technological problems, for instance the pen did not work; the IWB froze frequently; or writing was not legible. 10% of the younger and 20% of the older learners were put off by the fact that the teachers could not operate the IWB properly, and some of them recommended that the teachers were given extra training courses. A few learners of both age categories admitted that they could not concentrate on what the teacher was saying,
for they were distracted by the IWB. Some students wished the IWB was installed in more classrooms, and used in all classes, as it was underused by many teachers. 5% of the younger and 18% of the older learners announced that the IWB was not used in English lessons. It is worth quoting one younger learner who noted that “We have never worked with the IWB in English classes, so I am not sure, but in other subjects it helped me”. One younger and one older pupil said that the IWB helped in biology (or subjects in which pictures are necessary), not in English. Two older learners despised the IWB for being just additional technology, or for having to write down lots of information, and therefore they preferred a traditional board. Two younger and six older learners stated that they were not allowed to work with the IWB, but they would like to. For example, one younger learner suggested that they should work with the IWB physically; and one older learner guessed that “the IWB is operated only by the teachers because they probably think that learners would damage it”.

8.2 Grammar School Plzeň

8.2.1 Learners

The total number of questionnaires administered in Plzeň was 183, out of which 93 were completed by the younger learners and 90 by the older learners. The learners were at a variance with one statement. As illustrated in figures 7 and 8, the younger learners liked giving presentations in front of their peers (five of them left a note that they had no experience), but the older learners disliked it.
Figure 7. I like giving presentations in front of my peers. The figure shows the younger learners’ agreement.

Figure 8. I like giving presentations in front of my peers. The figure shows the older learners’ disagreement.

All the learners disagreed with two assertions. Firstly, the IWB did not strengthen their motivation to study, which is illustrated in figures 9 and 10.
Secondly, the IWB did not help them achieve better learning results, as shown in figures 11 and 12.
The learners agreed with the remaining nine statements, which is shown in the appendix 11.3.2. Similarly, the learners in Plzeň also shared their perceptions of the IWB by filling in the open-ended questions. Not being completed by all the learners, the number of questionnaires decreased, too. 74 younger and 75 older learners expressed
their liking for the IWB, whereas 66 younger and 56 older learners expressed their dislike. The percentage of the learners was counted from this amount of questionnaires.

To begin with, 43% of the younger and 29% of the older learners associated the IWB with fun, entertainment, modernity and less monotonous lessons being livened up. 38% of the younger and 23% of the older learners made a list of the diverse functions of the IWB, which tally with the ones mentioned by the Brno learners above. 16% of the younger learners and 5% of the older learners appreciated that they did not have to work with exercise books, and could see the screen. They did not need to frantically write down a huge amount of notes, or could take them down easily at their own pace. 5% of the younger and 16% of the older learners acknowledged that the IWB did not have to be wiped. A few younger learners added that notes were legible. The lesson was well-organised and they could take in subject matter. Learning materials were put on Moodle. They were more involved, or they liked technology. Several older learners concluded that the IWB made lessons and teaching process simpler. They stayed focused, and did not lose the thread of the teacher’s talk. They learnt and remembered more, and could make presentations. Notes on the IWB were legible and learning materials visible. Despite the fact that 27% of the younger learners condensed their answers into one sentence: “We do not often use the IWB”, and 32% of the older learners into “I don’t mind anything”, some learners were wordy. 27% of the younger learners and 38% of the older were discontented with technical hitches. For example, it was difficult to write with the pen, the surface could not be immaculately wiped, and stains hampered writing and reading. One older learner could not see what he or she was writing on account of his or her shadow reflected on the screen. The IWB slowed down the pace of lessons, and it took time to turn it on. Listening via the IWB was bad or things projected on it were faintly visible. Two older learners pointed out that space for
writing notes was compressed into left and right wings because of the middle part was reserved for projection. 15% of the younger learners wrote that they were not able to focus on a lecture, or the IWB and the teacher’s talk at the same time. A low number of all the students were critical of their teachers not being competent to use the IWB, and the younger learners advised that they should be trained. In addition, two younger learners were displeased with the teacher not letting them touch the IWB. Four younger learners did not omit to say that not everyone always had a go on it. One older learner longed for touching the IWB on his or her own. The younger and older learners criticised the IWB for being the cause of having to darken a classroom, and impairing their eyesight. On top of that, they were frank about not learning more with the IWB, and one younger learner about losing his or her imagination. Some of the younger and older learners were not afraid to judge the IWB to be a useless device that cost a lot of money which would be sensible to invest in something more effective. The IWB did not persuade some of the older learners that it was a “marvel” because it impeded the flow of lessons, older teachers were not ever going to use it, or not so many things could actually be done on it. Hence, it was a traditional board that earned their gratitude: “A normal board is simply the best”.

### 8.2.2 Comparison learners

The questionnaires yielded significant results, which now enables to summarise and identify similarities and differences between all the learners’ evaluating the effectiveness of the IWB at both schools, and to juxtapose them with the first part of the paper. All the learners were of one mind on eight statements, and at odds over four. To start with the positive, the learners conceived of the IWB as a device which raised the standard of teaching and learning processes; encouraged the retention of information; caught the learners’ attention, and increased involvement of the individual in activities.
Moreover, they would like to touch the IWB on their own, which the teacher permitted them to do so. Operating the IWB by themselves aided them in learning more than merely observing the teacher. They wished to use the IWB all the time in English lessons, as it eased teaching and learning processes. These findings substantiate the claims of the researchers in the previous chapter, except for the one about teachers’ permission to touch the IWB. Contrary to the learners in the first part of the paper, who were convinced that they were robbed of it, a handful of the Czech students felt deprived of not being able to touch the IWB because the majority agreed that their teacher did not forbid them from doing so. What is more, discrepancies between the schools, or the age categories of the learners arose in four beliefs. The IWB motivated the Brno younger learners to study, but did not motivate the Plzeň learners and the Brno older learners. This is a surprising revelation because the researchers in the first part found out that a preponderance of learners were undeniably motivated. It was the Brno older learners, who ran counter to the assumption that the whole class got involved in teaching and learning processes without being separated into pairs or groups when the IWB was on. This concurs with Öz’s finding, and implies that teachers teach in the old-fashioned way. Since the assumption was accepted by the rest of the learners, Winzenried’s opinion on an IWB being intended for whole class interaction is the belief backed up and predominating at the Czech schools. What is partly in contradiction to the first part is that while the Brno and the Plzeň younger learners were keen on delivering their presentations in front of their peers, the older pupils in Plzeň were not elated at it. Specifically, Öz’s research illustrated that the 15-year-old learners were disposed to delivering their presentations, but some authors were dubious about this age category, who they thought might feel uneasy, exactly as it was discovered in Plzeň. Lastly, it is unfortunate that only the younger learners in Brno felt the IWB advanced
their knowledge of the English language, which is one of the most significant points of
the paper devoted to using an IWB in English lessons at Czech schools.

Next to the statements, the learners had the option to openly express themselves.
The following brief, and yet fundamental review of the learners’ remarks on the IWB
overlap with and verify the conclusions of the first part. The reoccurring and most
repeated arguments in favour of the IWB were its entertaining or enjoyable nature
heightened by the miscellaneous functions. The IWB was valued for being a current
asset to the modern era characteristic of a boom in technology, and for being a
refreshing change from textbooks or routine procedures. Ergo, the wow factor,
mentioned in the previous chapters, can be validated because the Czech students were
fond of technology. The learners recognised the values of the IWB that lain in being
large and visual, which helped the learners hear, see and memorise what the teacher was
speaking about. Plus the learners’ had no longer a duty to wipe a board or tidy up chalk
dust. In general, it was easy to work with the IWB. Notwithstanding that a lot of
learners did not lodge any objections to the IWB, or the Plzeň younger learners
announced that it was not used, the learners were chiefly perturbed by the IWB posing
health risks, for example to their eyesight. The Plzeň younger learners’ announcement
about not utilising the IWB, which was made by some Brno learners as well, should not
be overlooked, for it hints that the teachers were luddites or tentatives, who “did things
in old ways”, as mentioned in the previous chapters. It is noteworthy that the learners
were annoyed at lessons being hindered by technological problems and the teachers’
lack of knowledge; and that some Plzeň learners would rather dispense with the IWB
because it was expensive and valueless, which leans towards the views of the learners in
the research conducted by Wall et al. in the previous chapter.
8.3 Grammar schools Brno and Plzeň

8.3.1 Teachers

In this subchapter, the linkage between the teachers at both grammar schools will be investigated, so as to gain an insight into the situation in the Czech Republic. The number of questionnaires returned from the Brno teachers was 9 and from the Plzeň ones 10. The format was the same as for the learners, but the difference was that it was written in English, and there were 17 questions. It will be commenced with the analysis of ten beliefs of the Brno teachers that coincided with the Plzeň ones, and then seven beliefs giving rise to conflicting views on the IWB will be examined.

On the one hand, according to the teachers, teaching and learning processes were broadly better with the IWB. They could monitor and have closer contact with the whole class while every learner was able to keep up with their teaching. Their teaching methods had changed thanks to working with the IWB. They could give better instructions to their learners. They were motivated to use the IWB because they could obtain a profusion of teaching and learning materials. They believed that the IWB affected all senses, catered for varied learning styles, and supported the inclusion of all learners in whole class discussions. Furthermore, it was determined by the analysis of the learners’ questionnaires at both schools above that they were allowed to manipulate the IWB, which is in harmony with the teachers’ agreeing with allowing their learners to touch the IWB. On the other hand, their time spent on preparing their lesson plans did not decrease; and PowerPoint presentations did not belong to the most frequent teaching materials.

Seven claims were not absolutely clear, or the teachers diverged from one another. The Brno teachers opined that they could make subject matter plain to their
learners, but five Plzeň teachers agreed and five disagreed, as illustrated in figures 13 and 14.

**Figure 13.** I can better explain subject matter to my learners. The figure illustrates the teachers’ agreement.

**Figure 14.** I can better explain subject matter to my learners. The figure illustrates the teachers’ agreement and disagreement.

The Plzeň teachers adopted a positive and the Brno teachers a negative stance on the proposition that their motivation for teaching with the IWB depended on how much their learners were thrilled about the IWB. Another complicated pattern arose from the
Brno teachers’ confirming that training courses on the usage of the IWB were arranged for them, but five Plzeň teachers disagreed. However, the margin is narrow, and when scrutinised carefully, four teachers agreed, as shown in figures 15 and 16. That might be the reason why the Plzeň teachers unequivocally condemned training courses as insufficient, whereas the Brno teachers as satisfactory.

**Figure 15.** Teachers are provided with training courses on how to work with an IWB. The figure shows the teachers’ agreement.

**Figure 16.** Teachers are provided with training courses on how to work with an IWB. The figure shows the teachers’ disagreement.
Five Plzeň teachers mounted a stand against the IWB being a device owing to which learners learnt better, but further five Plzeň and the Brno teachers agreed, as illustrated in figures 17 and 18.

**Figure 17.** Learners learn better when an IWB is used. The figure illustrates the teachers’ agreement.

**Figure 18.** Learners learn better when an IWB is used. The figure illustrates the teachers’ agreement and disagreement.
Using the IWB often for writing on it as if it were a traditional board was denied by the Plzeň teachers, but agreed by the Brno teachers. Such acknowledgment is very much in accord with the observations done at the schools. In spite of the fact that during the observations it was witnessed that the teachers struggled, for example, with the pen, only five Plzeň teachers did find it hard to manipulate the IWB, whereas all the Brno and five Plzeň teachers did not, as illustrated by figures 19 and 20.

![Bar chart showing teachers' responses to manipulating an IWB.](Figure 19)

*Figure 19.* I find it hard to manipulate an IWB. The figure illustrates the teachers’ disagreement.
At the end of the questionnaire, the teachers could convey more ideas of how the IWB had made a contribution to education, and what its major drawbacks were. A few Brno teachers directed attention to being able to vary activities with the aid of presentations or pictures. As a result, learners can listen to their talk and simultaneously see teaching and learning materials. This was lauded by one Plzeň teacher who could display presentations and pictures pre-eminently during speaking tasks. Two of the Brno teachers implied that the IWB came in useful for other subjects rather than the English language. Since the IWB was more colourful, one of them could better elucidate a task and used it for drawing in his or her art lessons. Some in Brno commented on the IWB making lessons interesting for learners; captivating younger learners at the age of 10-15 or younger; having an impact on all senses; involving learners in activities; being user-friendly and leaving behind no chalk dust. The Plzeň teachers were concurrent with the suggestions that the IWB was fun, modern, and therefore appealed to learners. Nevertheless, they principally touched on different issues. In their opinion, the IWB was dissimilar to working with textbooks; saved time.
when instructing learners; captured and held learners’ attention; mediated interaction; and the teacher had online materials at his or her disposal. One Brno teacher in particular was more eloquent, and described that he or she was in favour of PowerPoint presentations on things not available in textbooks, “not in English though”. The teacher could prepare an exercise which would take him or her a long time to design, but a minute or two for learners to complete, even if the exercise were complicated. The teacher wrote that: “I see it as another administrative thing being filled and ticked, yes, we do it at our school (Teachers work hours on it in their spare time, but we don’t have to)”. The teacher conceded that he or she would use it if it was compulsory, but not being forced, he or she did not bother. Some other Brno teacher declared that the IWB did not have any flaw because “the teacher doesn’t have to use it if there is no need for it”. Four Brno and seven Plzeň teachers were concerned with technological problems, such as uncomfortable writing, or the IWB failing to launch (and taking time to fix it). One Plzeň teacher blamed himself or herself for the IWB not functioning because the teacher could not utilise it. Another one could not rely on the IWB, for he or she was unable to repair it, and had to have a back-up plan. Preparing a lesson was perceived as a disadvantage by one Brno and three Plzeň teachers because it was burdensome and required more time. The Brno teacher asserted that it was demanding for learners to stay alert during presentations. This teacher added that knowing his or her presentations by heart, he or she had a tendency to explain and present subject matter too fast for learners to keep track of it, as opposed to a traditional board by dint of which “presentations and explanations were created on the spot/spontaneously”. The Plzeň teacher tackled the issue of attention from a different angle, for he or she announced that the IWB had “a disastrous impact on concentration on language problems themselves”. Turning to theories of psychologists, the Brno teacher assumed that the IWB adversely affected
learners’ psychological state if used regularly, for they were sitting in semi-dark or artificially lit rooms without being exposed to natural light. From the point of view of two Plzeň teachers, the first one maintained that the IWB resulted repeatedly in frontal teaching, and there were not many lessons to download. The second one believed that only one person being able to work with the IWB was a serious shortcoming leading to individual work.

8.3.2 Comparison

At last, the teachers’ beliefs mentioned above can be compared with the data in the previous chapters in order to provide the overall picture of the state of affairs. The meticulous scrutiny of the votes revealed that the Czech teachers looked on the IWB as a teaching aid that improved teaching and learning processes, but their conviction of the IWB did not seem to be as intense as it was depicted in the first part. Several statements were incorporated into the questionnaire with the aim of looking for proof of pedagogic change, which was noticed among teachers in the previous chapters, but was not rapid, precisely as in the Czech Republic. The idea was already insinuated above, as it was recognised that the teachers were luddites and tentatives “doing things in old ways”. Still, a sign of pedagogic change can be traced in the teachers’ confirmation that their teaching methods had changed; their instructions had got better; they let their learners manipulate the IWB; and they did not give preference to PowerPoint presentations. Nonetheless, the pedagogic change could be invalidated by the Brno teachers’ confessing that they wrote on the IWB as if it were a traditional board. It might be deduced from the observations that the Plzeň teachers did not agree with this assertion because the classrooms contained the IWB and the traditional board, which was at hand to write on instead of on the IWB. Furthermore, it must not be forgotten that in the chapter on observations as well as in the first part, the teachers did not really use any
Progressive programmes. They almost never granted their approval to learners’ interaction with the IWB. Oddly enough, that is the exact opposite of what the questionnaires revealed. In sum, it appears that the pedagogic change has not happened. The authors in the previous chapter proposed the training of teachers as a solution to the apparent evidence of the underused capacity of an IWB. While the authors ascertained that a lot of teachers underwent training which did not live up to their expectations, courses for the Brno teachers met their requirements. The reverse was true in Plzeň where the teachers argued that training courses were not provided, and they were consequently inadequate. The questionnaire did not cover other aspects relating to training mentioned in the first part, such as whether the teachers collaborated with their colleagues, learnt on their own, or requested special assistance. Likewise, the questionnaire missed out details about further obstacles to teaching with the IWB discussed in the first part of the paper. It cannot be told with certainty whether the Czech teachers were fearful of being unskilled, or were made timid by their learners’ good familiarity with technology. At least, on the basis of the teachers’ comments, it can be surmised that working with the IWB was time consuming. In fact, unlike the findings in the first part, the teachers rejected the presumption that preparation time of lessons was gradually reduced. The teachers worried about technological glitches, which is in accord with the first part. The premise in the previous chapters that the IWB was user-friendly proved to be right by the Brno teachers, but still half of the Plzeň teachers had difficulty operating it. The most striking finding and a great hindrance was that the Brno teachers were not compelled to teach with the IWB, which none of the researches in the previous chapters encountered. The prevailing attitude of the authors in the first part was that what might have stimulated the teachers to integrate the IWB into their teaching was their motivation enhanced by their learners’ genuine interest, and
by plenty of materials available to be downloaded and used for clarifying subject matter without difficulty. As it turned out, the decisive motivating factor for the Czech teachers was the access to materials, but some teachers were against easier clarification and learners as the determinants of their using the IWB. The IWB won the support of teachers in the first part because of ensuring learners’ participation, into which the questionnaire was supposed to probe, too. The Czech teachers affirmed that the IWB engaged all learners into whole class discussions, the more so because it suited individual learning styles, and established direct contact with learners. In the previous chapters and in this research, there was the widespread acceptance of the IWB being the agent of learning more effectively. Yet, half of the Plzeň teachers did not give credit to the IWB for that, and so the Czech teachers created the impression of being more distrustful of the IWB than their foreign counterparts.

Finally, there are parallels between the teachers’ comments on the open-ended questions and the first part of the paper, but a few remarks are worthwhile to be emphasised. Some teachers thought that the IWB was appropriate for other subjects than the English language, but it is suitable for all subjects. The beliefs of some teachers that teaching with the IWB ended in frontal teaching and individual work attests to the fact that pedagogic change has not occurred. It has not been understood that the IWB is not a projection tool and an interactive approach has been advocated. These are precisely three misunderstandings that Dostál in the first part tried to remove. The teachers, who pointed out that ready-made lessons were not accessible to them; or learners were kept in dim classrooms may also pose a danger to not using the IWB. Since certain issues surfaced in these findings, recommendation for the future can be formulated.
8.4 Conclusion

To sum up, it can be generalised that in the eyes of the Czech students and teachers an IWB was an intriguing device and up-to-date technology whose benefits of visual aids and multiple functions were extolled. The learners would give their assent to the increase in the number of IWBs at schools and in language lessons, even though it did not substantially motivate them to study and did not polish up their English. What may be behind such a pessimistic belief is that the evidence from the questionnaires and the observations point to no radical pedagogic change in the ways of the teachers’ teaching, and to the absence of the usage of the IWB. There were dissimilar circumstances at each school, but they did not make a difference to teaching with the IWB. It did not matter that in Plzeň each classroom was equipped with the IWB, and that the teachers in Brno were content with training courses. As a consequence, different motives for not using the IWB might be assigned to each school. In Plzeň, the IWBs had been bought recently, and were not set up well, so the teachers had to face technological problems. The teachers appealed for training and lessons obtainable from a database. In Brno, the teachers were disheartened by an arduous task of preparing lessons, and they were under no obligation to use the IWB. The questionnaires detected the bias of some teachers and learners against the IWB being appropriate for subjects other than the English language. That could be minimised if teachers attended subject-specific training courses, but according to the findings in the first part, such courses are scarce. One way or another, the future prospects do not look so bleak because, after all, the teachers and learners were receptive to the IWB. Nevertheless, the research disclosed that the usage of the IWB in the Czech Republic is somewhat low, and thus collective action should be taken to reverse this trend.
9 Conclusion

Technology is more and more permeating into education that reflects, albeit slowly, the 21st century dominated by technological devices. In order to become successful and productive members of society, learners are being prepared at school for the future. The current era has been shaping new 21st century skills, out of which digital literacy belongs among the most important. Learners should be able to manipulate various technological machines, as digital literacy is one of the first steps towards success. In effect, learners being born in this epoch are called digital natives because they are exposed to technology since their childhood. As a result, they will be able to deal with technology in education much easier than the older generation of teachers, who are digital immigrants. Not only learners, but also teachers are affected by any changes produced in the educational sphere. To keep up with the latest innovations, teachers should perpetually work on their teaching techniques, and harmonise them with new technological developments. Regretfully, pedagogic change is often refused by teachers who do not want to give up on teaching methods they are used to.

The paper was oriented towards one particular tool, an interactive whiteboard (IWB), which demands that teachers employ an interactive approach. Interactivity is a complex term composed of physical interaction with an IWB and intellectual interaction initiating whole class discussions, which may not be fully understood because an interactive approach has not yet fully developed. Furthermore, the paper was centred on two age categories of learners at the age of 10-15 to 15-19, so it touched on two relevant stages of cognitive development, Concrete and Formal operations, proposed by Professor Piaget. Regarding children’s cognitive development in connection with teaching with an IWB, an interactive constructivist approach is highly desirable because learners profit most from receiving and exploring information which they attempt to
interpret and arrange in their existing system of knowledge. On top of that, the author of Sociocultural perspective, Lev Vygotsky, stressed the importance of social interactions. Without teachers’ help, learners would not be able to make any progress. It is teachers who should estimate at which stage of cognitive development their learners are, so as to correspondingly adjust their teaching and select challenging but manageable tasks. At the core of the thesis were teachers and learners’ beliefs about an IWB. One of the aspects influencing their beliefs is most likely advantages and disadvantages of an IWB, which were therefore summarised. Even though an IWB has drawbacks, a survey of teachers and learners’ views on an IWB may help decide whether an IWB should be implemented or not. Notwithstanding the fact that the international research found out some teachers and learners scorned the usage of an IWB, and did not feel they benefited from it, they were exceptions to the greater number of teachers and learners whose opinions were positive.

The aim of the second part of the paper was to examine how an IWB has been employed by teachers, and how it is perceived by teachers and learners in English lessons at Czech schools. Due to the initial complications that hindered the process of finding schools available for the research, it seems that many schools in the Czech Republic have not recognised and acknowledged the usefulness of an IWB yet, especially in relation to learning languages. Unfortunately, the first part of the research, during which many lessons were observed, has proved that an IWB remains a tool the teachers avoid using, and they rather teach with textbooks, handouts or computers. It has been demonstrated that the teachers choose certain activities and programmes which probably suit them best, and towards which they continuously keep returning irrespectively of the age category of their learners. The prime purpose of an IWB to enhance physical and intellectual interactivity is not fulfilled or maybe understood, as it
serves as a projection device, or a big computer screen for writing notes in ActiveInspire or Microsoft Word programmes (which are either typed at the computer or directly with the pen), showing pictures or playing videos in the majority of cases. It may not be even unreasonable to come to a conclusion that an IWB is treated as an electronic version of a traditional board, since when switched off, its surface is often written on with a pen, and no innovative activities or patterns emerge. In the second part of the research, in which the questionnaires were analysed, the results of the observations were reflected. With reference to the learners, it has transpired that the teachers very rarely teach with an IWB, or they are incompetent users. Moreover, technological problems and health issues connected to an IWB are seen as the downside. On the positive side, an IWB has made a favourable impression on the teachers and learners because it is generally credited with improved teaching and learning processes. The teachers and learners enjoy the multifunctional and visual features of an IWB, which enable to combine spoken word with visual demonstrations, and supply them with more sources of information.

To sum up, an IWB is not refused by teachers and learners in general, which is encouraging for the future. Yet, it appears that teachers are not given enough support, and are presented with a fait accompli. No matter how much teachers are trained, or how many IWBs are installed at schools, there are more factors, such as time and additional work, that must be taken into account. Technological support, collaboration of staff and accessible materials should be ensured so as to ease the burden placed on teachers. First and foremost, the significance of an IWB must be grasped if the correct and frequent use is to be accomplished. Although there are teachers and learners who will always despise an IWB and innovations in education, their number is so low that money, time and effort invested in an IWB should pay off in the end.
10 References

Printed sources


Electronic sources


OqHV5I-

ilLPkDIPRs8mSRT6JFnT8uxCaCQDDyl9RLBz9iQP/Smart_VETLearningManualv02.6.pdf


11 Apendices

11.1 Questionnaires learners

<table>
<thead>
<tr>
<th>Názory žáků na interaktivní tabule</th>
</tr>
</thead>
</table>

Přečtěte si následující výroky, s kterými budete buď souhlasit, nebo nesouhlasit. Prosím, abyste ke každému výroku zaškrtili křížkem čtvereček, který odpovídá tomu, jak moc s výrokem souhlasíte nebo nesouhlasíte. Děkuji za vaši pomoc.

1. Výuka je celkově lepší s interaktivní tabuli než bez ní.
   - [ ] Naprosto souhlasím
   - [ ] Spíše souhlasím
   - [ ] Souhlasím
   - [ ] Nespíše souhlasím
   - [ ] Spíše nespíše souhlasím
   - [ ] Naprosto nespíše souhlasím

2. Díky interaktivní tabuli si lépe učivo pamatují.
   - [ ] Naprosto souhlasím
   - [ ] Spíše souhlasím
   - [ ] Souhlasím
   - [ ] Nespíše souhlasím
   - [ ] Spíše nespíše souhlasím
   - [ ] Naprosto nespíše souhlasím

   - [ ] Naprosto souhlasím
   - [ ] Spíše souhlasím
   - [ ] Souhlasím
   - [ ] Nespíše souhlasím
   - [ ] Spíše nespíše souhlasím
   - [ ] Naprosto nespíše souhlasím

4. Soustrčím se na výklad učitele, když používá interaktivní tabuli.
   - [ ] Naprosto souhlasím
   - [ ] Spíše souhlasím
   - [ ] Souhlasím
   - [ ] Nespíše souhlasím
   - [ ] Spíše nespíše souhlasím
   - [ ] Naprosto nespíše souhlasím

5. Jsem zapojený/á do aktivity v hodině, když se používá interaktivní tabule.
   - [ ] Naprosto souhlasím
   - [ ] Spíše souhlasím
   - [ ] Souhlasím
   - [ ] Nespíše souhlasím
   - [ ] Spíše nespíše souhlasím
   - [ ] Naprosto nespíše souhlasím

6. Do výuky je zapojená celá třída, když se používá interaktivní tabule (učitel nerozděluje žáky do dvojic, menších skup při práci s interaktivní tabuli).
   - [ ] Naprosto souhlasím
   - [ ] Spíše souhlasím
   - [ ] Souhlasím
   - [ ] Nespíše souhlasím
   - [ ] Spíše nespíše souhlasím
   - [ ] Naprosto nespíše souhlasím

7. Řád/řada prezentuji svou práci na interaktivní tabuli před ostatními spolužáky.
   - [ ] Naprosto souhlasím
   - [ ] Spíše souhlasím
   - [ ] Souhlasím
   - [ ] Nespíše souhlasím
   - [ ] Spíše nespíše souhlasím
   - [ ] Naprosto nespíše souhlasím

- Naprosto souhlasím
- Spíše souhlasím
- Souhlasím
- Nesouhlasím
- Spíše nesouhlasím
- Naprosto nesouhlasím

9. Učitel/ka mě nechává dotýkat se interaktivní tabule.

- Naprosto souhlasím
- Spíše souhlasím
- Souhlasím
- Nesouhlasím
- Spíše nesouhlasím
- Naprosto nesouhlasím

10. Nejvíce se naučím, když se sám sama dotýkám interaktivní tabule (než pouhým pozorováním učitele).

- Naprosto souhlasím
- Spíše souhlasím
- Souhlasím
- Nesouhlasím
- Spíše nesouhlasím
- Naprosto nesouhlasím

11. Chcete bych pořád používat interaktivní tabuli v hodinách anglického jazyka, protože ulehčuje učení.

- Naprosto souhlasím
- Spíše souhlasím
- Souhlasím
- Nesouhlasím
- Spíše nesouhlasím
- Naprosto nesouhlasím

12. Díky interaktivní tabuli dosahuji lepších výsledků v anglickém jazyce než dříve.

- Naprosto souhlasím
- Spíše souhlasím
- Souhlasím
- Nesouhlasím
- Spíše nesouhlasím
- Naprosto nesouhlasím

Doplňte následující otázky:

- Výuka s interaktivní tabulí se mi líbí, protože______________________________

- Výuka s interaktivní tabulí mi vadí, protože______________________________

Další komentář: zde je možné napsat cokoliv, co tě napadne ohledně interaktivní tabule, a co v dotazníku chybí:

______________________________

______________________________

______________________________

115
11.2 Questionnaires teachers

Opinions of teachers on an IWB

I would like to ask you to fill in this questionnaire, which focuses on opinions of teachers on an IWB in the English language classes on basic and secondary schools. This questionnaire is not a test, so there are no right or wrong answers. It is anonymous, too, so there is no need for you to sign it. I am only interested in your opinion. I would like to ask you to answer the questions honestly and truthfully because only in this way this questionnaire can be successful and useful. Thank you very much for your help.

Read the following statements with which you will either agree or disagree. I would like to ask you to tick the relevant square which best expresses to what extent you agree or disagree with the statement. Thank you for your help.

1. Teaching with an IWB is better than without it.

2. Thanks to an IWB I can see all my learners (better contact), and at the same time all learners can follow what I am presenting to them (as opposed to computers).

3. I can better explain subject matter to my learners.

4. My teaching methods have changed thanks to an IWB.

5. Preparations for lessons are getting shorter by degrees.

6. I can give better instructions (there are more possibilities: by means of pictures, the Internet etc.)

7. I am motivated to work with an IWB because my learners are excited about an IWB.

8. I am motivated to work with an IWB because there are so many teaching materials available to download.

9. Teachers are provided with training courses on how to work with an IWB.
10. I find teaching courses sufficient enough.

<table>
<thead>
<tr>
<th>Totally agree</th>
<th>Slightly agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Slightly disagree</th>
<th>Totally disagree</th>
</tr>
</thead>
</table>

11. An IWB has an impact on all senses. It is therefore suitable for learners of all learning styles (visual, auditory...)

<table>
<thead>
<tr>
<th>Totally agree</th>
<th>Slightly agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Slightly disagree</th>
<th>Totally disagree</th>
</tr>
</thead>
</table>

12. Learners learn better when an IWB is used.

<table>
<thead>
<tr>
<th>Totally agree</th>
<th>Slightly agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Slightly disagree</th>
<th>Totally disagree</th>
</tr>
</thead>
</table>

13. I often use an IWB to write on it (like on a traditional blackboard with chalk).

<table>
<thead>
<tr>
<th>Totally agree</th>
<th>Slightly agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Slightly disagree</th>
<th>Totally disagree</th>
</tr>
</thead>
</table>

14. I let learners to manipulate/touch an IWB on their own.

<table>
<thead>
<tr>
<th>Totally agree</th>
<th>Slightly agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Slightly disagree</th>
<th>Totally disagree</th>
</tr>
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</table>

15. I use PowerPoint presentations most frequently.

<table>
<thead>
<tr>
<th>Totally agree</th>
<th>Slightly agree</th>
<th>Agree</th>
<th>Disagree</th>
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</thead>
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16. The whole class is involved in whole class discussions during a lesson.

<table>
<thead>
<tr>
<th>Totally agree</th>
<th>Slightly agree</th>
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<th>Disagree</th>
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17. I find it hard to manipulate an IWB.

<table>
<thead>
<tr>
<th>Totally agree</th>
<th>Slightly agree</th>
<th>Agree</th>
<th>Disagree</th>
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<th>Totally disagree</th>
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Fill in the following questions:

The biggest contribution of an IWB is ____________________________

The biggest drawback of an IWB is ________________________________

Other comments – is there anything else you would like to add, as it is not found in the questionnaire? ________________________________
11.3 Analysis of learners’ questionnaires

11.3.1 Learners Brno

<table>
<thead>
<tr>
<th>Younger Learners Brno</th>
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100% 77% 56% 72% 78% 70% 76% 76% 61% 68% 81% 55%

Older Learners Brno

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90% 53% 70% 59% 58% 59% 60% 64% 52% 57% 57% 77%

learners’ agreement
learners’ disagreement
### 11.3.2 Learners Plzeň

#### Younger Learners Plzeň

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Total percentages: 91% 62% 57% 59% 73% 64% 57% 76% 77% 51% 69% 71%

#### Older Learners Plzeň

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Total percentages: 89% 56% 74% 71% 69% 54% 55% 60% 75% 53% 70% 71%

**learners' agreement**

**learners' disagreement**
11.3.3 Teachers Brno

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11.3.4 Teachers Plzeň

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11.3.3 Teachers Brno

11.3.4 Teachers Plzeň
12 English Résumé

The thesis deals with the usage of an interactive whiteboard (hereafter an IWB) in English lessons at Czech schools. An IWB has been introduced into education all around the world especially by states such as the USA, the UK, Canada and Australia. Since then research has been undertaken into the way an IWB is used, but also on how teachers and learners perceive a new teaching tool, and what impact it has had on teaching and learning processes. Due to the fact that an IWB is recent technology, and there are many gaps in research into teaching with an IWB in English lessons, the ultimate goal of the paper was to disclose how an IWB is utilised in English classes, and what beliefs teachers and learners hold about an IWB in the Czech Republic.

The theoretical background starts with the general, introductory chapter on information and communication technology, its place in education, and its advantages and disadvantages. Since the paper is limited to learners who are at the age of 10-15 and 15-19, one chapter is devoted to two stages of cognitive development, namely Concrete and Formal operations, proposed by a renowned psychologist Jean Piaget. The topic of information and communication technology is then narrowed down to an IWB, which is defined, and the attention is drawn to changes an IWB should produce in teaching and learning processes. Unfortunately, such changes have not always happened, and it seems there is a long way to go before an IWB is used to the same extent all over the world. The following two chapters revolve around themes which have already been tackled by several authors at schools abroad, and which have provided a stepping stone to the Czech research. Firstly, advantages and disadvantages of an IWB are outlined, and secondly teachers and learners’ beliefs about an IWB are delineated.

The second part of the paper reveals the results of the research conducted at grammar schools during English lessons in Brno and Plzeň. The data were gathered by
means of observations focusing on how new technology was embraced and employed by the teachers, and by dint of questionnaires that concentrated on the teachers and learners’ opinions on an IWB. The main aim was to find out the status quo in the Czech Republic, and compare it with the findings presented in the first part of the paper. It has been discovered that an IWB is still rather an underused device which plays a marginal role in English lessons at Czech schools. Although the teachers and learners’ overall impression on an IWB appeared to be favourable, there is a need for a remedy and support for teachers so that they will recognise the potential of an IWB, and will make the most of it.
13 Czech Résumé

Tato práce se zabývá užíváním interaktivní tabule (dále IWB) v hodinách anglického jazyka na českých školách. IWB byla zavedena do školství po celém světě zejména státy jako USA, Velká Británie, Kanada a Austrálie. Od té doby byl proveden výzkum zabývající se způsoby použití IWB, ale také tím, jak učitelé a žáci vnímají novou učební pomůcku, a jaký dopad má na vyučování a učení. Díky tomu, že IWB je novější technologie a ve výzkumu, který by zjišťoval, jak se vyučuje pomocí IWB v hodinách anglického jazyka je mnoho mezer, hlavním cílem práce bylo odhalit, jak se IWB používá v hodinách anglického jazyka a jaké názory mají učitelé a žáci na IWB v České republice.

Teoretická část začíná všeobecnou, úvodní kapitolou o informační a komunikační technologií, jejích místu ve vzdělání, a jejich výhodách a nevýhodách. Protože se práce týká žáků, kteří jsou ve věku 10-15 a 15-19 let, jedna kapitola je věnována dvěma stádiím kognitivního vývoje, jmenovitě Konkrétním a Formálním operacím, navrženým velmi uznávaným psychologem Jeanem Piagetem. Téma informačních a komunikačních technologií je dále zúžená na IWB, která je definována a pozornost je obrácena na změny, které by IWB měla způsobit ve vyučování a učení. Naneštěstí ne vždy k takovým změnám došlo, a zdá se, že je před námi ještě dlouhá cesta, než se IWB začne používat stejnou měrou po celém světě. Následující dvě kapitoly pojednávají o námětech, které již byly řešeny několika autory na školách v zahraničí, a které jsou odrazovým můstkem pro český výzkum. Za prvé jsou nastíněny výhody a nevýhody IWB a za druhé jsou popsány názory učitelů a žáků na IWB.

Druhá část práce odhaluje výsledky výzkumu, který se uskutečnil na gymnáziích během hodin anglického jazyka v Brně a Plzni. Data byla shromážděna pomocí observací, které se zaměřily na to, jak nová technologie byla přijata a využita učiteli; a
prostřednictvím dotazníků, které se soustředily na názory učitelů a žáků na IWB. Hlavním záměrem bylo zjistit stávající stav v České republice, a porovnat ho se závěry prezentovanými v první části práce. Bylo zjištěno, že IWB je stále nevyužívané zařízení, které hraje podružnou roli v hodinách anglického jazyka na českých školách. Ačkoli se zdálo, že celkový dojem učitelů a žáků na IWB byl příznivý, náprava a podpora učitelů je zapotřebí, aby učitelé rozpoznali potenciál IWB a co nejlépe ji využili.