Education 2.0: How the current system is no longer maintainable and should concern the future, not the past

In the modern age, one of the most important possessions is knowledge. It has become increasingly important for people to keep up as things easily become outdated. Universities come across problems with theories and subjects changing due to newer research. Meanwhile, high schools are in a backlog of innovation: the current system in place dates back to the industrial revolution and has almost no compatibility with the requirements for the future. Children are supposed to be educated for jobs that do not exist at this moment, prepare them to come up with solutions for problems that we cannot predict and work with still to-be-invented technology, yet we educate them in a way that is over 150 years old. The current system was conceived in the era of the Industrial Revolution. It was revolutionary at that time; people from all social classes could now profit from education for free. Ken Robinson, respected author who has published literature about “the Death Valley of education”, described schools like a factory in his TED Talk (2013); batches of children of the same production date go in, are moulded into shape and batches of young and educated adults come out. The wanted results were very different in the industrial revolution, the importance lay closer to production in factories than processing large amounts of data and knowledge, as is the priority right now. Therefore, schools should be focused on the future, and not dwell off into the past. As a result, the way of teaching should also be based on the future, as there are systems being tested that prove much better results. In this Independent Research Report, I will cover several subjects that all have to do with the future of education, for which I have formed the research question: Because the current educational system seems outdated, how should the current educational system be changed to be compatible for the 21st century? I will evaluate, analyse and explain the perspectives of people against and in favour of 21st century education of 21st century skills.

Firstly, I would like to discuss the skills required for the 21st century. The digital age we live in is filled to the brim with technology; we have found multiple ways to keep track of everything; for example, by taking a device out of our pocket or even looking at our wrist. One of the largest job areas that is expected to rise is the processing of

vast amounts of data. In the industrial revolution, however, the priority was labour and production efficiency. School curricula have not changed an awful lot, but organisations that promote other types of curricula are expanding. For example, the Partnership for 21st Century Learning (P21) has a very interesting vision on changing curricula to include education about the future. They see the importance of media literacy and global awareness, the latter playing a very important part in a student's perception of the world. The question with using a source is of course how credible this source is. P21 is founded by several institutions, including the National Education Association of America, which is an organisation that commits itself to the improvement of education throughout the US.

The paper *A Crosswalk of 21st Century Skills* published by Hanover Research (2011) is an elaborate study on the importance and details of 21st century skills, includes a ranking of all the skills that are deemed important for the 21st century. The report starts off with a bold statement, with a quote such as "the American school system is failing to adequately equip students with the necessary skills and knowledge to contribute to society" (Hannover Research, 2011, p. 2), which is said to be a shared opinion among the parties involved in the report. Does this question the objectivity of the report? The report is indeed filled to the brim with raw data, which cannot be easily subjective. They cover six different frameworks to establish their conclusions which includes the aforementioned Partnership for 21st Century Skills and the Assessment and Teaching of 21st Century Skills (ATC21S), a worldwide partnered set of 21st century skills.

The report contains a few tables containing the importance of 21st century skills (Hannover Research, 2011, p. 4-7). Coming in at number one is Collaboration (or teamwork), Creativity (or imagination), Critical thinking and problem solving. These terms seem vague, but make more sense if we look at the innovations that have taken place. Crowdfunding, crowdsourcing, social media platforms and the shared economy all point to a collaborative society, one where people share or work together. The other three in first place, creativity, critical thinking and problem solving are related to each other; they all come down to thinking outside the box, a type of thinking that requires someone to broaden his or her mind. Ken Robinson describes a perfect example in his RSA speech about changing educational paradigms

(Robinson, 2008). People were asked to come up with uses for a paperclip. Most come up with ten, twenty, fifty or a hundred. But some think outside the box and ask if the paperclip can be an extremely extraordinary different size and made out of a completely different material, such as rubber. This type of thinking is said to be one of the most important ways of reasoning by both the Hanover Research Report (2011) and also top universities such as Oxford and Cambridge. Oxford University Press has published several online guides for teachers called "Teach 21st Century Skills with Confidence" (https://elt.oup.com/feature/global/21st-century-skills), to further stimulate the spread of the 21st century teaching and skills. These guides are not only for high school teachers, but also intended for early use: there is also a great deal of focus on pre-school classrooms. Cambridge also puts emphasis on critical thinking in an assessment report and also makes use of the previously mentioned ATC21S framework, which makes it a credible source, as it used in numerous assessments and reports.

On the second place are the more global skills, some include global and cultural awareness and adaptability and the skill I started off with: the information literacy. I started off this section by giving a short summary of how we access this abundance of information. But this information does not present itself, it needs to be processed and made logical. For this, P21 (http://www.p21.org/about-us/p21-framework) states in their framework that 'Information, Media and ICT Literacy' are very important skills for the 21st century. According to their elaborate explanation of their framework, people should be able to make, evaluate, and use information properly. It is of no surprise that research by Hanover Research (2011) put this skill in second place, just behind creative and critical thinking, as it requires these types of thinking to process data.

The above-mentioned skills are very important for the future, but these are not always included in many curricula. According to a Cambridge assessment (Suto, 2013), critical thinking is already finding its place in the education of many sixth-form students. So has ICT literacy; it is found in the form of a subject, a way of learning or completely replacing the classic classroom, such as online initiatives as the Khan Academy or Coursera. There are, however, a couple of arguments against this development. M.E. Webb (2002) stated that he, among others, is concerned about

the lack of requirements for a teacher, that he or she is not required to know everything, as the computer is the main source of information.

Not only is this concern viable, but there is also a concern that underlies this statement that is shared by Paul W. Bennett, director of Schoolhouse Consulting, an independent research organisation that provides commentary on critical issues in education. Bennett criticises the 'worshipping at the altar of technology' in a dialogue posted on Dialogue by OurKids (http://www.ourkids.net/school/the-case-against-21st-century-schools); he states that it is not always a progress if technology is intervening too much in education. Bennett thinks that using too much technology is combating 'fundamental principles and foundations of our educational tradition'. This comes across as a reasonably grounded argument, but 21st century learning is trying to move on from those fundaments: Ken Robinson explains one of these fundaments.

> Academic ability has really come to dominate our view of intelligence, because the universities designed the system in their image. If you think of it, the whole system of public education around the world is a protracted process of university entrance. According to Robinson, education is shaped in the way for children to become academics. (Robinson, 2006)

A couple of decades ago, going to universities and becoming an academic was a guarantee of a job and commons stories were that some areas such as the arts do not have a future. This is why it has become fundamental in education. What happened over the last few years is that this guarantee has faded away and that it has been proven that you can get a job as an artist. This means that one of the fundaments of education, that P.W. Bennett wishes to protect, is no longer withstanding, which is a reason that the current global system is in dire need for a reform.

P.W. Bennett does agree with Robinson (2008) about divergent thinking; he favours this way of thinking above what Bennett calls "worshipping of the chimera promised by those 21st century machines". His use of terms is interesting, but seems to be fairly subjective even though some of his claims are grounded by research by others.

In order for these skills to be taught, some structural and practical changes should be made to the current educational system. The old 'factory'-like structure is not going to last if education is going to focus on skills. The structure is not going to last if creativity is becoming more and more important. It is certainly not going to last if there is more emphasis on personal development. An area where education is quite possibly most ambitious is in the Scandinavian countries. Countries such as Finland have a certain mentality where a teacher's profession is more than just standing in front of a classroom. Education is very personal and broader than in for example the United States. An organisation called Kunskapsskolan Education AB (http://www.kunskapsskolan.com/thekedprogram.4.52155b18128a87c7cfd80009543.html) is a group of schools in Sweden (and even in the UK, US and India) that is focused on "the student, rather than a statistical average of the student" (Kunskapsskolan Education AB, 2010), and promotes a Swedish type of education. Their KED Program's core starts with the student, setting personal goals and strategies, followed by coaching. Only after those elements are set, the Kunskapsskolan focuses on the curriculum, providing more student-based education. Their program is very interesting, as it is not focused on students as a whole, but students as an individual. Does it work? Kunskapsskolan can be found throughout the world, which proves its progress. Schools have been set up in the UK, USA, India and even The Netherlands, which is closest to my frame of reference about education because I currently reside in The Netherlands.

Ready by 21 is an initiative set up by The Forum for Youth Investment (FIY), which provides 'innovative strategies to improve the odds that all children and youth will be ready for college, work and life' (http://www.readyby21.org/what-ready-21, n.d.). They published a debate in which they state a few key arguments against 21st century learning, and some in favour. The report is a debate, so there are arguments both supporting and attacking the matter. The attacking side of the report criticizes the fact that it is not only skills that are required at the end of a school career; factual knowledge is important as well. I must say I agree with their statement, but the problem is that current educational systems only focus on this knowledge. According to their points, skills cannot be taught or applied without knowledge (FYI, 2009). This

argument seems to be stuck in a vicious cycle: there are skills that help to consume and process knowledge, but they state that you need knowledge to learn skills.

Their views also say that the 21st century learning will produce less prepared and educated students (FYI, 2009). This is deduced from a not yet complete form of education and the FIY already fears that not all students will have access to this type of learning, as it will require resources, including financial resources. This is of course true, the type of education is new and not fully implemented, and it cannot take off on its own. But this cannot be the reason to prevent the implementation of it. It seems rather illogical to completely halt progress because not everyone will get the chance at the start.

Another point of criticism comes from Tom Bennett (not to be mistaken with the aforementioned Paul W. Bennett) who is a teacher, author and director of researched. Bennett (2015) urges teachers and schools to be more sceptical. Due to the increase of all kinds of methods and platforms for 21st century learning, some teachers have lost their sceptic eye and do not reach out for evidence whether the method will work or not. As an example in an interview with The Telegraph, he describes the usage of tablets in classrooms, stating that all claims saying 21st century learning requires the usage of iPads are doctored statements by technology zealots and the manufacturers of such devices (Bennett, 2015) He is supported by recent research by the Organisation for Economic Co-operation and Development (OECD) that schools are overspending on education policies of which one in ten policies are actually evaluated to work (OECD Education Policy Outlook, 2015).

According to the upper mentioned research by Hanover Research (2011), one of the top skills required for the 21st century is creativity. According to the book “50 Myths & Lies That Threaten America’s Public Schools” (Berliner & Glass, 2014), a myth is debunked stating that schools focusing on creativity are wasting their time, and should be teaching students the facts to succeed in life. In my opinion, this could never be farther from the truth. Due to the increase of standardised testing, classrooms have become stricter and structural; thus decreasing personal freedom. This is making it much harder for creativity to flourish. Berliner is also concerned by how education is being motivated. Currently, there is a reward system: if you do well, you will be rewarded. If you do not do well, you will be punished. Students are

getting incentives to learn what is being instructed, not to be curious for acquiring knowledge. A climate of fear overshadows the classroom (Berliner, 2014): If a student does not meet the standards, there will be trouble. If a student does meet the standards, the teacher will be satisfied, but that is where it stops. This does certainly not satisfy someone's yearning for learning. Students will have little opportunity to prioritise their own creativity: it is more important in the current system for them to meet up to a set of standards (which are based on "everyone"). We can deduct from this that taking an average and calling them standards does not seem the most compatible way for education.

This is what Ken Robinson also blames to be the cause for the "Death Valley education is in" (Robinson 2013), the situation he describes in one of his TED Talks a few years ago. Children are put into groups that have the same age, not the same level. Standards are dictated by age, even though a child can perfectly excel in a certain course and have difficulty with another. He also criticizes the fact that there is always a division made between academic and non-academic, of which he makes abundantly clear that it is certainly not a division between intelligent and not intelligent. A controversial satirical comic, which spread around the educational world, explains standardized testing in a satirical way: a monkey, and elephant, a goldfish in a bowl and a few other animals stand in front of a tree. An instructor tells them the exam needs to be fair for everyone, hence they all have the same task: climb the tree. Of course it is not possible for some of these animals and this is exactly how some students feel; that they are 'trapped' in standardized testing. In order for standardized testing to work, several ways should be available to reach the top: a personalised way of getting through education. This is almost the exact opposite of standardized testing; some would call this alternative education. The problem is that this should be the main form of education, not the alternative (Robinson, 2013). It focuses on the student personally, instead of a group of students and taking the average, which is exactly what is needed for 21st century skill teaching. This is also where the Kunskapsskolan is focusing on: Prioritize students and their goals and then the curriculum (Kunskapsskolan Education AB, 2010).

A very interesting story developed in India, where children in slums (most not even literate) taught themselves how to use a computer and the internet. Professor

Sugata Mitra, a respected professor in the field of education and winner of the TED Prize in 2013, installed a computer in a wall in the middle of a New Delhi slum. Children soon found out about it and started trying to use this odd machine. On the first try, within 8 minutes, an illiterate child was already browsing the internet. After about six months, Mitra came back to the computer, only to find out that the children of that slum learned all the knicks and knacks of the system. They knew how to use all the buttons and were able to go online and download media. Upon asking how they knew how to do all this, they proudly said they taught themselves and then taught others. This proves that each human being is capable of learning on its own, by freeing its curiosity. The instinctual yearning for knowledge of the human being does not need any incentives, it motivates itself. The experiment proved that it is possible for people to teach themselves and that students do not need any form of punishments if they do not meet up to their standards; because these children worked together they all got to learn the same things at their own pace. The experiment was a wake-up call for several children, as the schools in that neighbourhood reported that there was an increase of children signing up for education and particularly for ICT courses and courses in the English language (Mitra, 2007). This is a very interesting model of education, and Mitra used this research to develop what he calls Minimally Invasive Education, education where there is no intervention by a teacher (Mitra, 2007). This experiment turned the model into a project, which now has around 300,000 children in India that benefited from getting the opportunity to become (digitally) literate.

Next, I would like to give an example of 21st century education; ‘Flipping the classroom’. It is of course not the idea of 21st century learning to get rid of teachers entirely, but to put emphasis on the natural yearning for knowledge and curiosity, which should be fully realised from the beginning of education by constantly keeping children stimulated and teach them interesting matter in an interesting way. As mentioned before, a climate of fear is not stimulating, but a climate of possibilities is: a student should be able to realise their full learning potential and creativity, as these are very important skills required for 21st century learning (Berliner, 2014). At the moment, there is an increasing number of evidence that there are indeed better working variations of education: Flipping the classroom is a concept that especially in

The Netherlands has become popular. A high school chemistry teacher now uploads videos to the video platform YouTube on all the subjects that students are expected to know in their high school career. Not only students from his school use it, but high school students from all over the country find the light in his videos. Flipping The Classroom rests on the sole idea that students get their lectures at home, through pre-recorded videos and that they use the class time to ask questions or clarify problems they found. The teacher then has a teaching role in the videos and a tutoring role in the classroom. Is this a viable methodology? According to a paper published in Science (Deslauriers, Schelew, & Wieman, 2011), two groups received the same lectures. One of the groups received the lecture in the classical way of teaching, the other within a 'flipped class'-scenario. The result: the score average for the control group was 41%, while the experimental group had an average of 74% (Deslauriers, Schelew, & Wieman, 2011). The most striking part was that the experimental group did not even cover all material, while the standard group did (The Economist, 2011). This could very well be caused by the so-called Hawthorne effect, but it remains hard to prove. The Hawthorne effect is an effect that has been around for some time and is about how people might perform better, mainly due to the fact that they are being examined for a trial (Franke & Kaul, 1976) It could very well be that the people in the trial group of *Flipping the Classroom* were actually performing better, mainly because they were being monitored.

To conclude this long and detailed research report, there have been two perspectives that have come to light. Firstly, there is a group of people that is very much in favour of 21st century learning and skills and seek to implement this in all forms of education. A prime example of this is the collection of Kunskapsskolan, a Swedish-based form of education that focuses on the student, rather than the curriculum. Its success is being proven by its expansion of schools over the world, as more schools seem to be interested in this new way of education. The focus on the student, rather than the curriculum is called personalised education, and seems to be a working concept. From several sources used in this paper, it is possible to say that it is of the upmost importance to encourage a student's personal yearning for knowledge: Sugata Mitra's experiment proved this. Everyone has a certain interest and a certain instinctual curiosity that links closely with creativity: It should not be

halted; it should be encouraged. Examples given by Ken Robinson about the current system are putting children in batches, of which the date of manufacturing is most important (a factory-structure) and that a couple of decades ago, an academic form of education was a guarantee for a job. He claims that this is no longer valid in a time like now.

The perspective in favour of 21st century learning also hugely criticize the way that creativity does not seem to be a number one priority and that there is little to no curriculum concerning the teaching of 21st century skills. This is because the perspective against 21st century learning think that factual knowledge is still more important than teaching skills, as you need knowledge to learn skills. However, the skills concerning the future are different than those taught now: 21st century skills include the widely-asked critical thinking, creative problem solving and divergent thinking.

To give an idea of how 21st century teaching works, I used an example of 21st century teaching called ‘Flipping the Classroom’, in which the teacher becomes a tutor instead of a lecturer. Students watch their lectures at home and can ask the teachers questions or for feedback in class time. This has proven to be fairly successful due to research published in Science, in which the group of which the classroom was ‘flipped’ scored higher than the control group, even though they did not cover all the material for the test.

The opposing perspective realises the importance of some of the skills, but does not agree with some of the ways of teaching, as they see it as a threat to the fundaments of the current educational system. People such as T. Bennett take a very objective position by taking a realistic approach: There are not advantages for everyone. Implementing technology into every piece of education is not a solution and a lot of knowledge is still required for some skills to be taught; hence he finds it important to protect these fundamental values of education.

Comparing the viewpoints of both perspectives, I deduct that there should be a middle way; an alternative perspective. Teaching 21st century skills is a good way of preparing students for the future, but some fundamentals of the current educational system need to stay intact, such as the teaching of factual knowledge. Firstly,

teaching the 21st century style of education is also a huge improvement, but more research and tests need to be done in order for it to become successful. Secondly, there is no counter-argument for Robinson saying that the current system dates back to the industrial revolution, and is therefore outdated, because this is a fact. This is one of the reasons why it is necessary for educational systems around the world to reform, but 21st century teaching needs to grow and improve much more to become a viable model. The basics are already here, and the finished result is in progress.

At the end of this IRR I would like to take the opportunity to personally reflect upon myself after writing. At the time of writing, I am a student in my last year of high school in The Netherlands. This causes me to have a certain viewpoint on education, completely different from teachers and researchers. Researching this matter, by finding out about all the improvements in education, made me have a clearer image in the entire world of education; the problems that are being faced, in particular the problem of an outdated system. As I did not know this, I always looked at the current educational systems as a common thing around the world; a system that is everywhere and works well. The first is true, but the latter could not be farther from the truth, I found out by research. This made me think critically about how education should be improved and what initiatives are already in place. I then, thanks to my tutor, came across the experiment by Sugata Mitra, which made me realise about what I prefer to call the ‘instinctual yearning for knowledge’, where humans are naturally curious and creative, no matter what their environment is. This caused my opinion about education as a whole to take a complete turn: I looked at education more critically, as to why students are not motivated and why education has stayed the same over the last centuries. At first I was not entirely interested in education: I am a part of it, but I never fully realised everything that brought it to its existence, and how it was not always normal to have around. I am quite interested in technology and electronics, and did not expect to be writing a paper about education, because I never even considered it. I then first saw the TED Talk by Ken Robinson (ranking in the top 10 TED Talks of all times) that made me interested in this specific subject. After researching this even further, by finding out about all the skills and ways of teaching, I became interested so much I decided to write this IRR about it, as I wished these problems could be resolved. Because of this paper, I now have a

clearer image of what we can expect in the future of education, and why this future is not yet realised. Writing this paper has made it able for me to open my eyes to the problems current educational systems are experiencing, and what the future has in store for us.

(4526 words)

Reference List

Bennett, P.W. (n.d.). *The Case Against 21st Century Schools*. Retrieved October 2015, from: http://www.ourkids.net/dialogue/?p=140

Berliner, D. C. & Glass, G. V. (Eds.) (2014). *50 Myths and Lies That Threaten America's Public Schools: The Real Crisis in Education*. Teachers College Press, p. 238-241.

Deslauriers, L., Schelew, E. and Wieman, C. (2011, May 13) *Improved Learning in a Large-Enrollment Physics Class*. Science. doi: 10.1126/science.1201783

Forum for Youth Investment and Ready by 21 (2009, September), *21st Century skills: Doomed pedagogical fad or key to the future?* Retrieved September 2015, from: forumfyi.org/files/21st_Century_Skills.pdf

Franke R.H., Kaul J.D. (1978, October). The Hawthorne experiments: *First statistical interpretation*. Am Sociol Rev. doi: 10.2307/2094540.

Gurney-Read, J. and Bennett, T. (2015, February). Tom Bennett: it's time to tackle the myths in education. *The Guardian*

Hanover Research (2011, August 11). *A Crosswalk of 21st Century Skills, p. 2 & 4-7*. Retrieved September 2015, from: http://www.hanoverresearch.com/wp-content/uploads/2011/12/A-Crosswalk-of-21st-Century-Skills-Membership.pdf

Kunskapsskolan Education AB (2010), Retrieved, September 2015, from: kunskapsskolan.com

Mitra, S. (2007). *Kids can teach themselves [Video file]*. Retrieved September 2015, from: https://www.ted.com/talks/sugata_mitra_shows_how_kids_teach_themselves

National Education Association, *About the organisation*. Retrieved September 2015, from: http://www.nea.org/home/2580.htm

OECD (2015). *Education Policy Outlook 2015: Making Reforms Happen*, doi:10.1787/9789264225442-en

Oxford University Press (n.d.), *Teaching 21st Century Skills with confidence.* Retrieved October 2015, from: https://elt.oup.com/feature/global/21st-century-skills

Partnership for 21st Century Learning. *Framework for 21st Century learning*. Retrieved September 2015, from: http://www.p21.org/about-us/p21-framework

Robinson, K. (2008, June 16). *Changing Paradigms [Video file]*. Retrieved June 2015, from: https://www.thersa.org/discover/videos/rsa-animate/2010/10/rsa-animate---changing-paradigms/

Robinson, K. (2006, February). *Do schools kill creativity? [Video file]*. Retrieved June 2015, from: https://www.ted.com/talks/ken_robinson_says_schools_kill_creativity

Robinson, K. (2013, May). *How to escape education's Death Valley [Video file].* Retrieved June 2015, from: https://www.ted.com/talks/ken_robinson_how_to_escape_education_s_death_valley

Suto, I. (2013). 21st century skills: Ancient, ubiquitous, enigmatic? *Research Matters: A Cambridge Assessment Publication, 15,* 2-8.

(2011, May) Teaching methods. *An alternative vote: Applying science to the teaching of science.* The Economist. Retrieved October 2015, from: http://www.economist.com/node/18678925

Webb, M. E. (2002) Pedagogical Reasoning: Issues and Solutions for the Teaching and Learning of ICT in Secondary Schools. *Education and Information Technologies*, 7(3), 237-255.