How to cope with tomorrow's challenges!

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Abstract:
Our society is confronted with various pedagogical challenges entering the digital era. Not only is the way we interact with one another changing, but the industry and the job market are changing as well. Teachers are more important than ever and face very different challenges during teaching than two decades ago. Not only is the digitalization introducing new technologies in class, different pedagogical approaches are needed just as much. The greatest potential within the digitalization lies in abandoning the traditional discrepancy between „equal access to education for everyone" and „personalization" due to digital material available. Furthermore, an adapted learning environment should foster educating self-dependent and responsible students. The basic job description of any teacher is to prepare his/her students for the life outside of school. By bringing in real-life interactions like adults face on the labor market and by introducing real life data and personalized learning content, future challenges ought to be confronted today.

Keywords:
challenges, education, digitalization, personalization, analog, digital, discrepancy, learning environment, space, technology, responsibility, labor market, industry, teacher, student

Foreword

I am an educational blogger most of the time and I look at challenges before us as they reveal themselves. In my various articles, over 300 at the time, I deal with educational and political challenges, knowing that those two often overlap. My style of writing inevitably reflects that. There are much more <scientific> papers available during this conference. My approach is very much descriptive and based on observations, participations in various European projects and campaigns and based on a deep cooperation with the Federal Ministry of Education. Working closely together with teachers, students and parents, my observations are backed up by European and scientific trends.

Introduction:

The labor market is about to change!

Often, we discuss that our children are going to need a different set of competences. Different to what we used to learn in school or at university. The digitalization might bring us to the post industrial era. How so? The source of all changes are the modernization and the digitalization.

An industry without people?

I attended two interesting conferences about the future of education. The eSkills High Level Conference in Bratislava and the eLearning Experts Conference in Eisenstadt, Austria. Both conferences agreed on one thing: The changes of the skill set required is going to effect not only the various teaching approaches but also the labor market itself. My inspiration in that regard derives from the car manufacturer Tesla. The cars are manufactured solely by robots while you cannot find human beings during the manufacturing process on the floor. One could argue that robots are going to perform monotonous tasks almost exclusively in the years to come. The <<advantages>> are obvious. Machines ought to work more precisely, there are no limits when it comes to working hours and human beings avoid dangerous jobs.

We need to reinvent ourselves!

Consequently, the nature of the human contribution to any manufacturing process is going to change. While machines will take over monotonous tasks, the human work force will switch to more qualified jobs. And during this process of educating our children, the digitalization is going to play a bigger role than before.

It will solve a very old paradox in education: Up to now, personalization and equal education for everyone did not seem to go hand in hand. Enter the digitalization! Digitalized teaching approaches guarantee that certain standards ought to be met while providing students with individual learning material. That way a teachers can cater to the individual needs of his students more effectively.

Are we really prepared?

The de-personalization of the labor market in not so qualified areas is going to have severe consequences. Trade unions are going to shift their focal point of their work or lose it for that matter. The classical blue-collar worker will disappear over the next decades and the

educational system is going to be confronted with new challenges as more people than before are going to need good education. Industry corporations are going to seek potentials of increased efficiency in the area of labor and trade deals like CETA accelerate these developments as corporations compete on a level playing field. So, politics, society and education need to be prepared for that. The major outcome of the eSkills conference was the Bratislava declaration where all key stakeholders, industry partners, school representatives and the European Commission agreed on eight measured to cope with the challenges ahead. The most important ones are ensuring that girls are becoming interested in science and the digitalization is becoming a natural part of education since digital competences need more awareness raising.

The pedagogical discrepancy!

Analog teachers in a digital world?

Teachers do the best they can in educating our children. But people who work in education relate to this dilemma! We work our behinds off and try to make a positive impact on the students' lives, yet we all feel that there is something missing. Fundamentally. We do not know what it is, but it seems like that the society we live in is changing so rapidly that it is hard to keep up. For political decision makers, for parents, for teacher and - most importantly - for the students. I actively choose to rest my mind. Pursuing my hobbies, sports and photography most of all, and I try to observe the way we interact with one another, during work, my leisure time or even while sitting on a park bench. So these are just my thoughts I collected during those times but they are backed up by some developments we observe in school.

Technology is all over the place!

First and foremost, new media are everywhere. We consume them with our smartphones and barely lift our heads while walking through the city. The technology is so deep within our daily lives that we cannot imagine how life would work without them. This is not a bad thing. The technology ought to make our lives easier and let us communicate with pretty much everyone we would like to. I often said that the levels of communication multiplied and we need to prepare our students in a way so that they can easily navigate through this jungle and master the technology, not to be its slave.

The teachers' job description!

As a teacher, the basic task is to prepare the students for the life outside of school. This is best achieved by not giving them just a set of rules and hope this set would serve them for years to come. It is far more promising to teach the students how to create their own sets of rules and teach them how those sets could be adapted over time. Because the truth of the matter is that more than 50 % of the pupils between six and ten years of age are going to end up in a job that has not been invented yet. Bearing in mind how fast society is developing, it is far more realistic to assume that the teachers prepare the students to adapt in order to manage their lives successfully.

People are -analog-, media are not!

The discrepancy between the way we interact as people and the disappearing social skills lies in one very obvious fact. We are humans and we are analog. Our thoughts are not based on zeros and ones. Yet, the educational system needs to prepare the students for the digital world but remain human at the same time. This is very difficult. Nowadays, children have a lot more friends than my generation could have ever imagined. But those friends are digital. There is no human interaction when someone adds you on Facebook.

Working in the educational system we need to address the tension between digital and analog. Yes, we work in a digital world and hopefully exploit the advantages of it. But at the same time we must never forget that all this digital assistance ought to improve the real life social interaction. When we feel like that there is something missing in education, it is a coherent strategy on how to address this problem.

Being human with digital help, not being digital with human help!

In my opinion, the best way to learn how to integrate real social behavior in digital patterns of communication and work is to permanently use digital media in school. Up to the point where they feel completely natural and not like you would need to make an extra effort to use them. The minute ICT is used like a pen, students and teachers do not focus on them too much and get back to real social interaction. If I call teachers -analog- I mean that in a good way. Being human can be taught more effectively that way. But it is absolutely essential that the new media become a completely natural part of school. And if they do, people are going to have less resentments.

A pedagogical solution?

The Learning Space! An individual Thing!

When talking about improvements of our educational system, there are a lot things to consider. To my mind, it all comes down to the learning environment we create for our students. And I do not mean that strictly architecturally. More than anything, creating a learning environment is a pedagogical question. There are many different types of learning spaces. But the most important thing is the focus on the result, the pedagogical outcome. I could not care less about the name of any given type of school, these questions are normally answered on a political level. All we should care about are the effects on our students. Basically, schools need to get closer to the real life. But what does that mean?

Student centered is the only option!

A teacher centered approach where teachers stand in front of the blackboard while hoping their students do not fall asleep should be banished forever. Make students feel like they have a relevant input on what is happening in class. When I mentioned that schools need to be closer to reality, I referred to the way we work as adults. Fostering group work among students, creates an atmosphere where students feel like they are contributing to the class outcomes in a relevant way. Bearing in mind that in the business world we usually work together in teams, group work among students is a wonderful way to prepare them and train social skills. And one blueprint for a new learning environment officially exists. The Future Classroom Lab at the European Schoolnet in Brussels (http://fcl.eun.org). I talked about it a couple years ago during the EDUVision-Conference in Ljubljana. Basically, there

are six learning zones with different pedagogical approaches. All of them have in common that they are students centered.

Self-dependent students?

Isn't the ultimate goal of schooling to teach students to evaluate themselves realistically in order for them to be better human beings? Being self-dependent has a lot to do with self awareness. Also, to understand other people, you need to get to know yourself. But teaching self-dependent students also has a lot to do with the right assessment. Students need a clear assessment and I do not believe in school systems without any assessment. Nevertheless, I look at it in a different way. In my opinion - and that concurs with a lot of pedagogues - it is really a matter of the individual reference point when assessing students. What do I mean by that? You have to consider the individual talents and challenges. If a student is extremely gifted in mathematics, a C would be quite bad. But if someone has major deficits or challenges in calculating, a C would be excellent. A pedagogical learning environment has to take these factors into consideration. First, we need to look at the student's individual talents, then we should design a learning scenario that suits him. Therefore talking about learning environments is a pedagogical question.
For example, the BG Klosterneuburg, a grammar school near Vienna, reproduced the famous jump from Felix Baumgartner (http://www.innovationsschule.at/2016/10/10/english-breakfast-remember-felix-baumgartner/). Remember, he jumped out of 38 kilometers of altitude. Students purchased a weather ballon, put eggs of triops in there, let the ballon raise and after it bursted, the eggs sailed to the ground. Everything tracked by GPS, so the package could be found easily. The teacher let the students organize the whole event and acted as a coach. The students formed teams with different areas of expertise which suited the individual talents.

Form follows function!

More than anything, a learning space/environment is a pedagogical setting. And adapting the pedagogical setting does not cost money. It just needs a motivated teacher. And the teacher would also be the one knowing how to integrate new technologies in a pedagogical sense. First and foremost, we have to think about our pedagogical goals and primary settings. Then, we can think about the space that is available and how to adapt it. Not the other way around. Often, teachers approach me and tell me that they have a lot of architectural restriction. If the classroom follows the pedagogical setting adapted by the teacher, it can look very different with very few aids. Try to rearrange the tables in the classroom, for example. One can bet that suddenly it looks very different.

Don't wait!

The most important lesson I have learned in educational policy is not to wait for anything. If we wait for politics to change anything, we would be getting very old. To a lesser degree the same applies for the regional school authority - at least in Austria. The most effective way to stimulate changes is by the teachers and students themselves. And little measures can have a major impact. Rearranging the tables in class, fostering group work and focussing on educating self-dependent students could be a great start. Most effectively, this could be done by emphasizing more on the competences rather than on the content taught

in school. In my experience, the other stakeholders will follow if there is the slightest possibility to change anything. So don't wait, our students are going to be very thankful.

Conclusion

The paper shows that we are facing severe challenges in the years to come. Especially concerning the labor market and preparing our students for those circumstances. Looking at pedagogical approaches, we can observe different variations. Project-based learning, inquiry-based learning or group work. But these approaches have one element in common: They are centered around the students instead of the teachers. For years, pedagogical experts endorsed student-centered approaches. Looking at innovative schools in Denmark, Sweden or Norway, there is a tradition of student-centered teaching dating back to the 1980s when technology did not play the role it plays today. Bearing that in mind, one could argue that it really is a matter of cultural implementation.

So much for the pedagogical basis. When it comes to teaching materials, digitalization is going to play an important role. Portals like Scientix (http://scientix.eu), lreforschools (http://lreforschools.eun.org), ODS (http://opendiscoveryspace.eu) or the Phet-Portal (https://phet.colorado.edu) are prefect examples for that. Moving away from the traditional textbook, which restricts innovative teachers, might be essential. Knowing the curriculum off by heart, it becomes easier to integrate new materials in school. An example of a modern textbook is used in the school BG Klosterneuburg - among others. Working with QR codes, it becomes much more interactive.

To sum up: There are two sides of the coin. If the ultimate goal is to prepare the students for life after school. One needs actual material, real life data and the integration of the technology students use anyway and a student-centered approach. Think of this example: If a surgeon gets frozen in the 1950s and defrosted in an operation room today, he would not have any idea, where he is. That story is very different for a teacher. The world around us changed dramatically and even more so in the last 20 years due to the rise of the internet and cloud services. Yet, we still believe that our students can be taught the way we used to be taught. According to André Richieu (European Commission DG responsible for growth, industry and skills development) during the eSkills High Level conference, there are still 400.000 jobs open in the IT industry that cannot be filled because of a reasonable skills gap in our society. Bearing the European unemployment rates in mind, that challenge has to be dealt with.

Also, participating in our society successfully becomes a matter of mastering the tools available and education has to react systemically. The levels of communication, the availability of resources and the security & privacy issues should not be overlooked. To integrate new technology, mastering them accordingly and successfully participating in our society (on a private, business or democracy related level) are the main objectives of education today. And as stakeholders of the educational system, we need to confront those challenges straight forward.

One aspect is the most important one and I saved it for last to emphasize it: The digitalization of education bridges two traditional contradictions in education: <Education for all> and <personalization>. Through digital content one can guarantee a certain standard while teaching the students sets of competences and using digital material, teachers are able to cater more effectively to the individual needs of any student. The potential is there as well as the challenges. What are we going to do about it?

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