

Creating Innovative Structures in Workplace and Vocational Digital Learning to Ensure Social Distancing

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Abstract—The COVID-19 pandemic has influenced learning, including Vocational Education and Training (VET) and workplace learning in companies. Many people with special needs (social or disabilities) have not benefited from the e-learning systems used in this period, and emphasized the fact that digital innovations are necessary in all types of education. This paper highlights the importance of disruptive digital innovations in education, such as personalized e-learning and e-mentors, and presents examples of structures and social measures, which can be developed around improving learning during the COVID-19 crisis to ensure social distancing.

Keywords-COVID-19; workplace learning; vocational education and training; disruptive innovation.

I. INTRODUCTION

The COVID-19 pandemic has influenced all types and levels of learning including Vocational Education and Training (VET) and workplace learning in companies: a generation of learners have seen their usual education and training processes disrupted [5][7].

E-learning systems and other digital tools change the way people approach learning and training and could offer access to learning content to everyone. They support learners to be more active and motivated, allowing them to choose how, when and where they learn. Learners can progress at their own pace and review what they have not understood. Such systems support life-long learning, allowing people to gain new skills and knowledge in order to adapt to a changing job market. During a pandemic, these digital systems may create new opportunities for stronger international collaboration. Adaptability will be crucial for the next generations to navigate through the present—and any future—pandemics.

Many people with special needs (social or disabilities) that limit learning activities should also be beneficiaries of e-learning systems because such systems offer the flexibility to adapt training programs to meet their specific needs. However, this has not happened. Special measures and disruptive innovations are necessary so that students and companies' employees do not suffer when continuity is not being ensured through distance learning.

In the first section of this paper, the necessity and importance of disruptive digital innovation in education is discussed and some examples are given. The next section includes structures and social measures, which can be developed around improving learning in the COVID-19 crisis to ensure social distancing, particularly in Germany.

Such measures have been taken within a workplace-oriented learning program for companies developed and tested during the COVID-19 pandemic within a European project and adapted for VET. In addition, other measures taken in Germany to help teachers and trainers to move into their virtual classrooms and workplaces are also presented. Some conclusions for educational institutions, companies and governments to improve education in the existing pandemic crisis are given in the last section of the paper, with particular reference being made to e-learning.

II. DISRUPTIVE INNOVATION IN EDUCATION

Disruptive innovations in education are intended to break with an established model and to introduce an improved one. Ken Robinson underlines in [12] that, while economic, cultural and personal spheres have undergone enormous transformation over the last 50 years, education systems have not modified their syllabuses or their objectives. Curtis Johnson, co-author of the bestseller *Disrupting Class: How Disruptive Innovation Will Change the Way the World Learns* [4], explains that the current form of teaching "is unable to provide today's pupils with the skills they need to master in order to interact with and within the digital society" and so disruptive education is necessary that approaches learning in another way. However, innovators in the education segment have not disrupted the status quo significantly so far. In 2008's *Disrupting Class*, Christensen predicted great disruptions in the segment from online learning. However, while there has been much adoption of digital learning, this has not proved very disruptive; online education continues to reflect traditional models rather than a disruption.

Disruptive innovation has the capacity to improve education and outcomes. One condition is that educators embrace a free-market mindset [6]. Cooperation and new ways of thinking can also help to replace an obsolete schooling model of education [1]:

A. Disruptive innovation supports equitable access to mentors.

Mentoring is an old approach used within education, but it has not been equitably distributed [11]. Disruptive technological innovations enable the use of e-mentors who are accessible to the masses independent of location. This includes all students with social problems or disabilities, not just a few.

B. Disruptive innovation supports the creation of a personalized education system.

New digital technologies, also disruptive ones, support personalized e-learning through flexible online curricula, new staffing structures and personalized support, which is particularly important for people with special needs [16]. Some examples include [4]:

- Power MyLearning, which actively involves teachers in wraparound services and family engagement so that teachers' academic decisions can be sensitive to the non-academic factors present in students' lives.
- City Connects, which integrates a range of targeted poverty relief and afterschool services into schools.

These are an important reminder that, just as personalized instructional models focus on using instructional data to target learning, personalized support models also hinge on high quality, longitudinal non-academic data. Luckily, tools are starting to emerge to make these data-driven practices more feasible.

Education is a complex services business in which quality is difficult to define, particularly in times of Covid-19. However, innovative approaches, innovative methods and innovative formats are necessary. Universities and other training institutions have a big role in disruptive innovations in education – also in workplace ones – and they have to adapt to changes. Some milestones include [2][10]:

- Practice over theory: universities should concentrate their efforts on the acquisition of skills and abilities adapted to the new reality rather than to concepts.
- Multidisciplinary learning: the frontiers between disciplines no longer exist and training must be adapted and content-rich to create far-reaching professionals. Methods like Problem-Based Learning (PBL) should be used.
- Digital innovation: many universities now have their own virtual areas for training, partnerships and shared knowledge purposes.
- Closer links with the job market: universities should become platforms for connecting companies and students and promoting the entrepreneurial spirit.
- Making competitiveness a priority: universities must be ever more competitive in order to transform themselves into research leaders and new knowledge areas.

Turning to VET and workplace learning, VET teachers and trainers have an important role in companies, but they face difficulties in their efforts to respond to the current crisis [3]. COVID-19 consequences are seen at all levels of education, but seem more severe for the workplace learning and VET sector. The work-based component has been interrupted in companies offering apprenticeships due to closures in many European countries.

Teachers and trainers have to meet the new demands imposed on them during the crisis and to overcome the new

challenges that they must now face, and they need more support and greater investment in their area. Only 60% of teachers received professional development in Information and Communication Technology (ICT) in the year preceding the Organization for Economic Co-operation and Development (OECD) survey [13] while 18% reported a great need for development in this area. These figures highlight that teachers need to renew their skills regularly in order to be able to innovate their practices and adapt to the rapid transformations inherent in the 21st century. This is even more important in the current context, where the COVID-19 health crisis has pushed teachers to adapt very quickly, especially in countries where they do not necessarily have the pedagogical and technical skills to integrate digital tools into learning.

Workplace learning in companies is emerging as one of the earliest and hardest-hit business activities [8]. Efforts are made to reskill employees, but companies cannot simply take a pause of critical workplace learning, even as they try to focus on employee safety first.

In connection with COVID-19, disruptive innovation in education should be combined with better socially oriented service models that are built around an improved educational program quality for all.

III. THE SOCIO-ECONOMIC IMPACT OF COVID-19 ON THE MOST VULNERABLE LEARNERS AND CONTRIBUTION OF E-LEARNING

Social distancing measures have a big impact on a large section of the population who do not have the means to protect themselves against the virus, which requires means and resources that a large section of the population lacks. Many people do not have access to suitable learning facilities or the required skills to use digital technologies and a large number of learners from disadvantaged backgrounds or with disabilities are missing education because they do not have access to the Internet or the digital skills to take part in online classes. As an example, in Gelsenkirchen, Germany, the unemployment rate is about 40% and there are many refugees and European migrants with big families and very limited digital skills [9]. This gap is seen across countries and between income brackets within countries. 95% of students in Switzerland, Norway and Austria have a computer to use for schoolwork, but only 34% in Indonesia (OECD Data). Therefore, the pandemic will widen the digital divide [14][15].

In Germany, the education ministers decided to provide financial support so that each teacher has a laptop (Notebook) and each student an Internet connection.

To continue to enable and deliver value-creating efforts, learning leaders have to consider taking a number of tactical steps to protect learners with social problems and/or disabilities, adapt programs and delivery, and establish and expand virtual live learning. E-learning programs were already on the rise before COVID-19 and there is a marked increase in such learning programs. Many younger

employees embrace such approaches, but they should be available for all.

In the following, we describe some tactical steps and strategic measures, such as exploring alternative digital learning strategies, which managers can develop during this time of social distancing and thus avoid disrupting workplace learning.

Within the European Erasmus+ project [7], involving a consortium with higher education institutions and research organizations, chambers of commerce and Small and Medium Size Enterprise (SME) representative bodies from Germany, Ireland, Spain, Lithuania and Romania, a hybrid-training program for workplace-oriented learning has been developed, supported by a digital platform. Discussions have been held in Germany on how to adapt it for a special course within VET. A short time after starting the program, some companies and VET institutions closed due to the COVID-19 pandemic and later the program had to be continued exclusively digitally. Initially, 178 employees from all five-project partner countries registered for the learning program. In each country, 20 learners or more planned to take part. After their companies were closed (March 2020), only 30 learners wanted to continue.

To create a comprehensive picture of how to adapt the training to this new environment, a cross-functional response team composed of members of the German partner responsible for the project, managers of some interested companies and VET has been formed. Because some people with cognitive disabilities and migrants wanted to undertake the training, we invited two persons with knowledge in this context. Therefore, the COVID-19-response effort was coordinated within the project. Two e-mentors and one tutor supported the training program. The tutor particularly supported the learners with special needs, i.e. with registration, simplification of some activities and exercises, and e-mails to communicate more often with these learners. At the end of the project, (August 2020) 20 learners from Germany finished the course. It is planned that an adapted form of the e-learning program will be started at the company Flüchtlingshilfe Solingen that is embarking on a new project.

Turning to VET, in order to provide individual learning support for learners at risk during the pandemic in Germany, so-called “transition coaching” supports students at school to acquire general secondary education or to complete (assisted) VET or another form of upper-secondary education. In cooperation with the individual student, the coach prepares a transition plan. To ensure continuity of tailored support during this crisis, the transition coaches have adjusted their services, steering young people as much as possible towards individual guidance services by phone.

To support apprentices at risk in Germany, a programmer managed by PES Germany and co-funded by the European Social Fund offers a special form of support for disadvantaged young people to reduce early school leaving

from VET, given this disruption to the apprenticeships of VET learners [3].

Germany celebrated Digital Day 2020 with many high-profile guests, such as government officials and business leaders, on 18 June 2020. The Digital Day is connected to 1,435 campaigns related to digitalization across Germany. The theme of the event was “Digital for all” with a focus on digital participation.

On September 22, 2020, the Federal Foreign Office, the Federal Ministry of Education and Research, the Federal Ministry for Economic Cooperation and Development and the German Commission for UNESCO held a digital event to present the 2020 UNESCO Global Education Monitoring Report: Inclusion and Education. It was highlighted that poverty is the main obstacle to success in education, that global partnerships for education have to be strengthened, and that inclusion needs well-trained teaching and training staff because they have a crucial role to play when it comes to ensuring participation in the education sector.

“Inclusion 4.0 Ruhr - Digital Support Systems for Employees with Cognitive Disabilities” is a network funded by the Federal Ministry of Education and Research to teach employees with intellectual disabilities to secure and expand their jobs in workshops and companies by using innovative digital assistance systems [9].

IV. CONCLUSIONS

The COVID-19 pandemic has created the largest disruption of education systems in history, affecting nearly 1.6 billion learners in more than 190 countries and on all continents [15].

During the COVID-19 pandemic, companies, VET institutions and other educational establishments have needed to address new issues. Massive efforts have been made in a short time to respond to the shocks to education systems and have showed that change is possible. However, the solutions were not always fit for purpose because the necessary – and not always available – equipment had to be found, including new online tools and resources. Many teachers and trainers have to be reskilled. Marginalized and vulnerable learners have to be involved in e-learning procedures. Educational institutions have to think carefully about their choices regarding e-learning, particularly personalized forms, e-mentors and inclusive education technologies. Disruptive innovations are necessary because the crisis has shown that no digital inclusion without measures to minimize social distancing exists [9]. Governments should consider focusing on equity and inclusion, reinforcing capacities for risk management at all levels of the system, enhancing consultation and communication mechanisms, addressing learning losses and preventing dropouts, offering skills for employability programs, supporting the teaching profession and teachers’ readiness, and supporting flexibility across levels and types of education and training.

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