

Use of Knowledge Management Systems to  
Prepare Students and Close The Skills Gap

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**Abstract**

There is a significant skills gap between qualified applicants and high skilled jobs. Students are ill prepared by K-12 schools to learning and develop knowledge in a collaborative and fluid digital age. As technology rapidly changes, schools find new challenges, thus creating new goals to develop the skills students need to compete in a digital workforce. Furthermore, there is an imbalance between preparing students for tests and developing thinkers and decision-makers. Knowledge management systems may be the solution K-12 schools use to meet new goals of developing students that can (1) think, learn and decide through evaluating information (2) utilize technologies to solve problems and innovate once information is found. Technology systems such as Canvas, Haiku, Google Classroom and Massive Open Online Courses (MOOCs) give K-12 schools viable options to prepare students with knowledge management systems.

### **Thesis and Introduction**

K-12 schools should increase their use of knowledge management systems and technologies to close the skills gap and better prepare students for the digital work-world. As technology rapidly develops, K-12 schools are faced with new challenges and moving targets to develop the skills students will need in a fast moving digital age. (Denning, 2014) This paper reviews several peer-reviewed articles to discuss: the current state of the U.S. labor force and K-12 education; the extent to which K-12 schools are preparing students for a digital work world; systems and technologies that schools should employ to better prepare students for the workforce, and current applications of knowledge management systems in K-12 education.

### **State of Education & The Labor Force**

#### **Skills Gap**

As new job openings increase, so does the skill-level required to perform those jobs. (Solomon & Lynne, 2007) Generally, technical jobs that require analytical and collaborative skills tend to be vacant and harder to fill. For example, in 2012, ManpowerGroup, a large US staffing agency, reported that 52% of employers reported that a talent shortage makes it difficult to fill opens. Additionally, industries in technical areas face a skills gap as large percentages of employees retire with too few skilled prospects to fill their roles. (Cappelli, 2012) This paper identifies two leading factors to a growing skills gap in America's labor force. First, K-12 schools lack a balance of managing school accountability and creating fluid learning environments that promote creativity and knowledge creation. Second, technology continues to develop at a rapid pace while K-12 institutions struggle to adapt and solve new challenges. These two factors, among others, result in a labor force that lack the skills needed to fill new openings.

**K-12 Imbalance**

Further widening the skills, K-12 students are not making the grade to compete for the world ahead. Author Maurice Ghysels indicates that in order to prepare students for 21<sup>st</sup> century success, K-12 public schools must strike a balance between accountability in schools and providing creative technological spaces for students to truly develop 21<sup>st</sup> century skills. (Ghysels, 2009) Ghysels indicated in “Will Students Make the Grade in an Education for the World Ahead”, that our education system has become factor-based. Teachers, knowing that their evaluations are based on test results, teach to testing content and not to the standards students are required to master.

Essentially, students are being developed to assimilate to poor learning practices and memorization of test content, instead of being allowed to freely thinking, learning and collaborate to create knowledge. In many ways, these teaching practices have dominated the public schools and have become significant contributing factors to low student development. As these practices continue, schools tend to neglect the development of the whole child, which prevents actual learning and stifles creativity. Ultimately, students graduate lacking the skills that are necessary to allow thinking, innovation and creativity.

**Race Against Machines**

“Race Against the Machines”, authors Erik Brynjolfsson and Andrew McAfee describe the world that we live in as, automated and taken over by machines. Following the recovery from the great recession of 2007-2009, companies rebounded, markets recovered, production increased, and new jobs were created. (Brynjolfsson & McAfee, 2011) However, machines filled the roles of American workers in these newly created jobs and increased unemployment. Further decreases in low-skilled jobs were created as factor-based jobs were shipped overseas to less expensive factories.

While companies outsourced and increased their utilization of machines to carry out work once completed by humans, American workers continued to lack technology skills needed to secure available jobs. In Brynjolfsson's and McAfee's reflection on "Race Against the Machine" the authors stated, "*Our technologies are racing ahead but many of our skills and organization are lagging behind.*" (Brynjolfsson & McAfee, 2012) The two author's statement holds true for many current K-12 institutions in the United States as schools work to increase and understand information technology to prepare students for future careers. Many continue to argue that technology skills are necessary for people to find success in the modern labor force. (Ghysels, 2009) However, more than technology skills, individuals now require knowledge management skills to compete in a new digital labor force.

### **New Goals for Schools**

The world we live in surrounds modern students and labor forces with an ever-evolving and interconnected system of digital content. When found, digital content, contains information that can produce knowledge. Knowledge, in-turn, allows for faster more accurate decision-making. The goal of schools was once to produce workers for factories. That goal then evolved to producing workers that possessed technical skills, to race against evolving machines. Now schools must reach a new goal. This goal has two parts. First, schools must prepare students that can learn, think and make decisions by efficiently finding, evaluating and using digital information. (McGettick, 2014) Second, schools must also develop students that have the necessary technical skills to utilize available technologies to produce efficient, solutions, ideas and decisions, once information is found. (Ananiadou & Claro, 2009) Meeting these new goals should produce a new generation of people that stand a better chance at competing against their global peers and add value to their economy.

## **Preparing 21<sup>st</sup> Students and Developing Skilled Adults**

### **Knowledge Management Systems**

Much of our current labor market requires people who have skills and competencies fit for knowledge economies. A knowledge economy is extent to which a nation's economy is developed using people's ability to learn and innovate. (Cooke, 2002) Most, if not all, skills needed in knowledge economies can be learned through the use of knowledge management systems. Knowledge management systems skills include information; selection, acquisition, integration, analysis and sharing in socially networked environments. (Ananiadou et. al, 2009) These same skills are similar to the new goals schools must now meet to prepare students for current and future jobs. Knowledge management systems are Information Technology systems that allow people to store and retrieve information, improve collaboration, identify sources, mine digital repositories and manipulate information to improve access to and use of future knowledge. (Frost, 2015) Essentially, those individuals that are exposed to and can effectively use knowledge managements systems are exposed to processes and technologies that can develop necessary 21<sup>st</sup> century skills.

### **Knowledge Management Systems in K-12 Schools**

The idea of knowledge management systems being used in education to impact students is not a new concept. Historically, knowledge management systems were primarily used in private nonprofit and public institution of higher education to collect information and share among administrators. (Dew, 2012) However, as technology evolved, more K-12 schools have begun employing knowledge management systems for students in the form of eLearning, content management and learning management systems. Currently, there are many popular knowledge management systems being used in K-12 schools. Online services such as Kanvas, Haiku and Google Classrooms are three well-known leaders in the knowledge management systems for K-

12 schools. These three systems are often referred to as content management systems. However, the term content management systems often used interchangeable with knowledge management system.

### **Learning Management Systems**

The need for knowledge management systems like Canvas, Haiku and Google Classroom is higher now than ever before. This increased need is due to an abundance of new digital content, applications, and tools students need to access, be aware of and utilize to develop knowledge and solve problems. Knowledge management systems like Canvas, Haiku and Google Classroom give students the opportunity to practice, collaboration, research, computer navigation, typing and other 21<sup>st</sup> century skills in a secure and curated environment. These systems utilize the power of the Internet and thousands of Web Applications to enhance student learning. Internet use alone in K-12 schools is said to have profound effects on learning outcomes and computer use by students. (Blomeyer, 2002) The Institute of Knowledge Management in Education highlights the development of students' ability to evaluate content and making decisions with web-based applications like Canvas, Haiku and Google Classrooms.

### **eLearning Systems: MOOCs**

Other knowledge management systems, such as Massive Open Online Courses (MOOCs), have the capacity to break down socio-economics barriers to narrow the skill gap. For example, students that do not have access to a wide variety of courses, such as technical and advance courses, get the opportunities to do so with MOOCs. This is particularly impactful for rural schools that are too remote and lack sufficient budget or staff to provide advanced courses. MOOCs and other knowledge management systems can afford distance-learning opportunities to students that are remote due to illnesses, disabilities or natural disasters.

MOOCs are also breaking down geographical barriers by allowing students to collaborate with peers locally and overseas with positive results. For example, Miami Global Academy opened its online classroom system in 2013 for 143 middle and high students in the United States and 20 other countries. (Bock & O'DEA, 2013) These students using systems like MOOCs and Canvas get an opportunity to learn in a modern 21<sup>st</sup> century manner. As traditional approaches of learn, where students learn about world continue to fade, more collaborative forms, like that offered through MOOCs, entice and engages modern students. (Thomas & Brown, 2011) Through these innovative forms of learning, students have an opportunity to engage with each other and build social and technical skills to compete in a global economy. While systems like MOOCs increase access to courses in a digital format, they have the potential to also increase graduation rates, develop students' skills and reduce dropout rates.

### **Implications and Conclusion**

Many educators are on the fence about the impact of knowledge management systems like Canvas, Haiku, Google Classroom and MOOCs. Many argue that institutions that implement online systems and neglect investing in good teachers make a costly mistake. Like most systems and technologies, knowledge management systems should be part of a toolset for educators and not a stand-alone solution or *silver bullet*. (Kim, 2015) If implemented as a compliment to good educators, knowledge management systems are powerful tools that can be used develop the skills students need to become competitive economic contributors in a digital work world. To prepare students in an age of abundant digital content and increasing collaboration, knowledge management systems may be the solution K-12 schools use to meet new goals. Thereby, developing the technical and careers skills students need to close the skill gap.

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