

# The Role of Design Thinking in Refocusing the Secondary Education System

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## ABSTRACT

Although the current education system has been designed to prepare students for life after school, there is a large disconnect between the skills students need for the workforce and the skills they are being taught. Design thinking offers a human-centered approach to creative problem solving that can serve as a solution to the current education crisis. Method: The present review synthesizes qualitative and quantitative studies published over the past two decades that examined the application of design thinking in the public secondary education system in the United States. Results: Two main applications of design thinking were identified for the secondary education system: curriculum design and project-based learning programs. Conclusion: Design thinking is a promising tool for improving student preparedness during secondary education. However, there are limited quantitative studies that have examined the direct link between design thinking and educational outcomes. Future research is needed to establish the effectiveness of implementing design thinking in the secondary education system and clarify the most promising applications.

## Introduction

Today, the secondary education system in the United States focuses students on skills associated with recall and testing rather than fostering natural creativity and workplace readiness. In order to prepare students for the rapidly changing future, we must reorient the education system to teach skills of adaptability and innovation such as creativity, critical thinking, problem solving, collaboration and active learning. We will explore design thinking as the solution for refocusing the education system and preparing students to enter the workforce.

## Background: The Problem with The Education System

Although the current education system has been designed to prepare students for life after school, there is a large disconnect between the skills students need for the workforce and the skills they are being taught. This fact is rooted in the fundamental challenges that the education system faces today: an unpredictable future, market unawareness and misinformed educator priorities. This has led students in today's secondary education system to focus on content-based learning rather than skills of adaptability and innovation.

The first challenge that the secondary education system today faces is preparing students for an uncertain future. Today educators are tasked with preparing students for the world after school without knowing what to expect in the future. Sir Ken Robinson, an education specialist and international advisor on education, stated that "We have a huge vested interest in it [the education system], partly because it's education that's meant to take us into this future that we can't grasp. If you think of it, children starting school this year will be retiring in 2065. Nobody has a clue ... what the world will look like in five years' time. And yet, we're meant to be educating them for it" (Robinson, 2007). Without understanding what to prepare students for, educators must rely

on current understanding to teach students, leading to students learning outdated information that will not be relevant in the future workplace.

Another challenge that the secondary education system faces is market unawareness. Many educators today are unfamiliar with changing employer expectations, leading to a widening of the gap between skills taught by educators and skills sought by employers. A recent study aimed at investigating the role that education plays in employment found that only 42 percent of employers believe their recent hires were adequately prepared by their pre-hire education for an entry-level position (Mourshed et al., 2013). The education system is meant to prepare students for the workplace, yet less than half of employers believe that the students had been prepared adequately. Even more interesting were the responses generated by students and educators to the same question. Only 45 percent of youths felt they were adequately prepared for an entry-level position in their chosen career field, yet almost 72 percent of education providers believed their graduates were adequately prepared for an entry-level position (Mourshed et al., 2013). While educators believed that they were preparing students for the workplace, both the majority of students and employers viewed the education system's skills development as inadequate. Lastly, the study found that about one-third of educators could not estimate the percentage of their graduates who found jobs (Mourshed et al., 2013). Educator unawareness of market and employer expectations means that educators are unable to adjust and adapt their curriculum to prepare students to find jobs in the future.

Finally, the secondary education system faces the challenge of misinformed educator priorities. When asked to identify their priorities, educators surveyed identified helping students find employment as sixth of the top ten priorities for teaching (Mourshed et al., 2013). Job employment fell behind more common educator priorities such as classroom success and content memorization. With a focus on content mastery, students learn skills of memorization and recall rather than skills of adaptability. This leads to many students being unable to adjust to changing workplace conditions, leading to a greater number of students being unprepared for the workplace and the growth of the skills gap.

## Identifying The Skills Needed For The Future Workplace

The secondary education system in the United States today focuses on skills of content-based learning such as memorization and recall; however, to better prepare students for the future workplace the system must be re-focused to emphasize skills of adaptability. Over the last decade, skills of adaptability, defined as qualities that promote flexible adjustment to one's environment, have emerged as the most in-demand workplace skills for employees. Two reports published in 2016 and 2020 by the World Economic Forum Report on the Future of Jobs offer valuable insight into what skills are currently needed in the workforce and what skills will be required for students of the future. In the 2016 report, the primary work-related skills across all industries needed by employers were cognitive abilities, systems skills, complex problem solving and process skills (The Future of Jobs Report 2016). The 2020 report identified a similar set of skills as the most in-demand for preparing individuals for the future workforce. These skills include analytical thinking and innovation, complex problem-solving, critical thinking and analysis, and creativity (The Future of Jobs Report 2020). Additionally the 2020 report cited critical thinking, problem solving, self management and collaboration as the current most important skills for employers (The Future of Jobs Report 2020). Taken together, skills of adaptability that are currently most in-demand and that will prepare students for the future workforce include creativity (the ability to create original ideas), critical thinking (objective analysis and evaluation of a problem to form a judgment), problem solving (finding and implementing the strongest solution for a problem) and collaboration (working with others to create something). These skills enable employees to adapt to changing market conditions and anticipate the future workplace.

Although the skills of adaptability are the skills most important to future employment, they have faced decline in secondary education. This steady decline in skill-based learning is evident in the trends of creativity

scores in American students. Kyung Hee Kim at the College of William & Mary discovered a creativity score decline after analyzing almost 300,000 Torrance scores of children and adults. Torrance scores are an index used to measure a human's creativity levels and are used by programs across the world to assess a program's effectiveness. Creativity is measured by having students complete activities while researchers tested three mental characteristics: fluency, flexibility and originality. Dr. Kim found that creativity scores had been steadily rising until 1990 but that since then creativity scores have consistently gone down (Bronson & Merryman, 2010). Despite skills of adaptability being the most relevant to future success, a continued focus has been placed on content-based learning and memorization in the United States, leading to a gap in key skills such as creativity.

The reason for the United States' focus on content-based learning, memorization and recall is rooted in misinformed beliefs and an emphasis on standardized testing. Beginning with the K-12 No Child Left Behind Act signed by President Bush in 2002, standardized testing has become a focus of the United States public education system. At the time, the United States observed rising testing in nations around the world, including China, and wanted to demonstrate the effectiveness of the United States education system by showing rising test scores. Public secondary education shifted completely to center on AP Tests, SAT scores and standardized learning. Even though the act was ended in 2015 by President Obama, the act's influence on the public education system of the United States remains. Students in America's big-city public schools now take an average of 112 mandatory standardized tests between prekindergarten and the end of 12th grade (Strauss, 2020). Additionally, state governments have placed a greater focus on testing in the United States secondary education system through teacher evaluation programs. Teachers in states such as Florida were incentivized to focus more on testing when the government offered millions of dollars in bonuses to teachers whose students achieved high SAT scores (Strauss, 2020). As a result of this intense focus on testing and standardization, students learn to rely on memorization and recall as the keys to success in education. This leads to students focusing their time on developing such skills rather than learning skills of adaptability which are not rewarded by the current system.

Although public secondary education programs in the United States are not currently cultivating skills of adaptability, modern research and international efforts both demonstrate that these key skills can be fostered through the education system. University of New Mexico neuroscientist Rex Jung concluded that students who diligently practice creative activities, defined as activities that promote multiple attempts and learning from mistakes, learn to recruit their brains' creative networks more quickly and more effectively. Dr. Jung deduced that consistent habits gradually change the neurological pattern, which can lead to increases in skills development (Bronson & Merryman, 2010). Additionally, researchers at the University of Oklahoma, the University of Georgia, and Taiwan's National Chengchi University each independently conducted large-scale analyses of university programs that encourage creativity and found that creativity training can have a strong effect on students (Bronson & Merryman, 2010). Both studies support the idea that practicing skills can develop long-term habits, which would help students implement skills in their future careers. Around the world, programs to encourage these skills and reduce the emphasis on recall, memorization and standardization have begun to appear. In China, there has been a nationwide education reform to extinguish the drill-and-kill teaching style, which overwhelms students with information to be recalled and thereby kills their motivation to learn. Today, Chinese schools are also adopting a problem-based learning approach (Bronson & Merryman, 2010). Additionally, in 2008 British secondary-school curriculum was revamped to emphasize idea generation, and pilot programs have begun using Torrance's test to assess their progress (Bronson & Merryman, 2010). Students in the United States can also acquire skills of adaptability, but a refocusing of the secondary education system is needed.

## **The Consequences of Content-Based Learning for Workforce Preparedness**

The largest impact of a secondary education system that overlooks skills of adaptability and focuses on rote memorization and recall is employee unpreparedness. In a stagnant workplace, memorization would be beneficial to students as the content of the market would not change. Unfortunately, in today's world this is not the case and employees face new conditions both when the workplace changes and when they change their career. Both of these factors, in combination with the education system, is leading to an acceleration of employee unpreparedness which is creating greater marketplace inefficiencies and higher costs for employers.

### **Reason 1: Rapid Change in The Workplace**

One of the largest contributors to employee unpreparedness is the nature of the rapidly changing workplace. According to the 2016 World Economic Forum Future Report on Jobs, in many industries the most in-demand occupations and specialties did not exist ten or even five years ago (The Future of Jobs Report 2016). The report also stated that 65 percent of children entering primary school today will ultimately end up working in completely new job types that do not yet exist (The Future of Jobs Report 2016). Therefore, employees must be prepared to adapt their current understanding and apply background knowledge to new and unexpected industries. Without this ability, employees risk falling behind in the workforce, facing higher rates of unemployment, and failing to meet the expectations of skill-based jobs. Furthermore, the report states that the pace of change is set to accelerate (The Future of Jobs Report 2016), indicating that employee unpreparedness is also likely to increase.

Additionally, the COVID-19 pandemic is set to accelerate the rate of change in workplace structures and create new dynamics within industries. Businesses across the world have had to adjust their business models to incorporate online structures with over half (59 percent) of executives claiming that their businesses will adopt a hybrid working model post-pandemic (Business Leaders, 2021). Despite this fact, one in four executives believes their leaders lack the skills to manage the workforce they want to build (Business Leaders, 2021). Along with the use of new technologies, changing business structures will lead to a new employee interface and unforeseen changes in workplace demands. Without a foundation in skills of adaptability, the educational background of most students will fail to help them create new opportunities in unfamiliar fields and will lead to decreased workforce productivity.

### **Reason 2: Job Uncertainty**

Another reason for employee unpreparedness is increased job uncertainty. Many students are uncertain about their chosen industry and often find themselves switching careers. In a research brief titled *Education To Employment: Designing A System That Works*, surveys found that many youths make poor decisions when it comes to deciding what to study (Mourshed et al., 2013). One cause of this problem is that students are not adequately prepared to make career decisions at an early age, with fewer than half of those surveyed confident that they would choose the same course of study if they were able to choose again (Mourshed et al., 2013). As a result, many adults choose to change careers and industries often, with the average person changing careers 5 to 7 times during their working years (Dimovski, 2020). Given this state of affairs, every person must be adequately prepared to adjust to new industries, where they may not be familiar with the environment, skills, or expectations. Stronger emphasis on skills of adaptability over content in secondary education would enable students to adjust to the rapidly changing workforce and personal preferences. Without skills of adaptability, employees are left unprepared for career opportunities and changes.

## The Consequences of Employee Unpreparedness

High rates of employee unpreparedness in the workplace have led to unnecessary costs for corporations and higher rates of inefficiency in the market. The growing threat of employee unpreparedness has forced many firms and organizations to take drastic measures to retrain employees. For example, employers surveyed in the Future of Jobs Survey reported that they provide reskilling and upskilling programs to 62 percent of their workforce, and that by 2025 they will expand these programs by a further 11 percent (The Future of Jobs Report 2020). Due to the lack of skills of adaptability employees have when entering the workforce, employers are forced to create these reskilling programs, which raises costs. In the year 2020, companies on average spent about \$1,111 per employee on training and development (Malik, 2021). Additionally, a study found that in North America alone, an average of \$165.3 billion is spent every year on employee retraining (Training, 2022). Such programs represent an unnecessary and expensive drain on resources. Furthermore, professional development programs use up valuable company time. The average employee spends anywhere from about 42.1 to 55.4 hours per year on training programs (Malik, 2021). Not only do these programs create higher costs for corporations, but the time spent on the program is inefficient for the company and creates a high opportunity cost for programs.

Moreover, employee engagement remains a challenge for many corporations. The Future of Jobs Survey noted that employee engagement in skills-development programs lagged, with only 42 percent of employees utilizing employer-supported training opportunities (The Future of Jobs Report 2020). While employee training can offer specialized industry skills to employees, lead to community building and even show employer investment in employees, ultimately low engagement demonstrates that these programs are proving to be ineffective in achieving their goal of training the workforce.

While the workplace offers an ineffective learning environment, secondary education provides a prime window in which to develop new skills. According to a study that analyzed the ideal time to learn new skills, around the age of 12 learning capacity of skills is significantly reduced (Janacsek et al., 2012). The closer students learn skills to the age of 12, the more effective practice and teaching is. The secondary education system offers a prime opportunity for skill development as students are able to handle complicated and real world coursework while learning skills of adaptability. By incorporating skills development early and often in the secondary education system, students will be able to develop a stronger set of workplace readiness skills by the time they transition to being employees. The solution to employee unpreparedness is to teach skills of adaptability early and often in the secondary education system. In order to do this, we will analyze design thinking as a method of preparing students for the future workplace.

## **Solution: Design Thinking**

The solution to the problem of employee unpreparedness is the integration of new programs into the public secondary education system that will help to refocus student development and better prepare students for the future. These changes must focus on changing both habits and mindsets in order to have long term effects on the students and contribute to greater employee adaptability in the future workplace. One process that has proven to be effective is design thinking.

Design thinking refers to a process of creative problem solving that utilizes the tools of iterative design, empathy, and ideation to drive social innovation. Tim Brown, the CEO and president of IDEO called the process “a discipline that uses the designer’s sensibility and methods to match customers’ needs with what is technologically feasible and what a viable business can convert into customer value and market opportunity” (Chong and Lee, 2016, p. 2). It is a process that emphasizes a bias towards action and a failing forward mindset, learning from mistakes and not giving up, allowing the user to move towards a solution while developing the skills of adaptability. According to the Hasso Plattner Institute of Design at Stanford, implementing the process follows

five main stages: empathize, define, ideate, prototype, and assess (Dam, 2022). Each stage in the process contributes to the development of certain skills that can be taught and developed early in students. In the first stage, empathize, the user is encouraged to connect emotionally with the people that they are trying to help, teaching the skills of empathy, communication and collaboration. The second step, define, teaches students to reassess their goals and understand the problem they are trying to solve. The third step, ideate, in which students try many different versions of solutions, allows for creative problem solving and critical thinking about solutions to the problem at hand. The fourth step, prototyping, teaches the students how to create tangible versions of their solutions which can then be tested. The last step is to assess the solution the user has created, encouraging the user to engage with feedback and build upon their work. These steps encourage the growth and development of key skills in students and can be implemented in school systems today.

## How Design Thinking Encourages Skill Development

Practice and implementation of the design thinking process gives every user a toolkit of skills to draw on when facing uncertain circumstances. Ultimately, design thinking allows the user to better understand the perspectives of those around them and adapt to unfamiliar situations. The toolkit includes techniques to expand skills such as creative thinking, critical thinking, and problem solving while developing practical solutions to real-world problems (Chong and Lee, 2016). With a set of tools at their disposal, students feel more comfortable and confident in their ability to adapt to new situations, think creatively, and solve any problem they encounter.

Through its iterative approach and its emphasis on real-world understanding, the design thinking process helps to develop the skills of adaptability in its users. Skills like critical thinking and problem solving are developed as the user works through the process and spends time brainstorming and ideating solutions. Skills like collaboration and creativity are fostered as the user works with team members and community members to understand the root of the problem. Finally, skills associated with active learning are developed through the process's circular nature which allows for engagement in continuous learning (Chong and Lee, 2016). Once the problem is solved, the student is encouraged to solicit feedback and continue to revisit the initial problem to ensure that the needs of the user are met. These skills are developed throughout the process, further closing the skills gap.

The design thinking process is also effective in developing creative confidence and self-efficacy in students. Not only does the process of design thinking center on helping others, but it also requires the students to face real-world problems. By embracing the notion of failing forward, the process teaches every student that it's acceptable to make mistakes in their work. This leads to students making more attempts to solve a problem, encouraging breakthroughs in the development of their solutions through repetition and persistence. Design thinking also encourages an iterative style of design, promoting evaluation, testing, and editing. The iterative nature of the process also engenders greater confidence because students lose their fear of making mistakes. Sir Ken Robinson said, "We stigmatize mistakes. And we're now running national education systems where mistakes are the worst thing you can make. And the result is that we are educating people out of their creative capacities." (Robinson, 2007). Design thinking's confidence-fostering capabilities allow students to understand that making mistakes is acceptable and that it is a part of the learning process. This differs from the school system today where students rarely have opportunities to redo assignments or retake tests and are rather told that their mistakes are final. This system discourages new and creative approaches to assignments because students constantly look to satisfy teacher expectations and meet assignment guidelines.

## How Design Thinking Can Be Implemented In The Education System

To reorient the education system so that skills development becomes a higher priority, the design thinking process can be integrated into the classroom, creating a space that promotes innovation, creativity and student

empowerment. There are two main ways that design thinking can be incorporated into the education system in a time-saving, cost-effective and flexible manner. The first is by using the process of design thinking to overcome the challenges of curriculum design and the second is teaching design thinking directly to students.

### *Creating The Foundation: Teacher Training and Support*

In order for design thinking to be effectively implemented in secondary education, teachers must first understand the process and recognize how it can fit into their classroom. Teacher preparation creates the foundation for the incorporation of design thinking into the classroom. Training and support for teachers has been proven to lead to more effective implementation of the process and contributes to mitigating difficulties that usually arise in the process's application (Lor, 2017). To best prepare teachers, we have identified three unique strategies that provide teachers with different avenues to achieving design thinking expertise, varying in style, cost, and timeframe.

The first strategy involves training teachers through professional development programs. School administrators and district leaders can incorporate design thinking training into existing programs and create an effective environment for learning the process. Teacher development is already a central focus in many schools in the United States today, with the average teacher spending about 19 days in professional development per year (Layton, 2015). The incorporation of design thinking into these existing programs would allow for teachers to learn the process and enable them to incorporate it into the school system. Many free resources and programs are available to administrators and teachers, such as those provided by leading design thinking institutions such as IDEO's design thinking educator handbook (IDEO, 2013). Focusing on professional development as a means of preparing teachers for the design thinking process allows existing educators to incorporate the process into the education system and can be done at a relatively low cost.

The second strategy involves teaching design thinking through first-hand experience, a strategy that encourages the student and teacher to work through the design thinking process simultaneously. Teachers would use free design thinking resources, such as those mentioned above from IDEO (IDEO, 2013) during classroom time to begin design thinking programs with students. By working through real-world problems teachers can learn the process alongside the student. This strategy promotes a deeper understanding of the process, as the teacher works through the unexpected complications and challenges of real-world problems, learns how to balance authority with collaboration, and creates a positive team environment (Carroll, 2014). This method involves minimal prerequisite training and promotes experimentation, greater room for creativity and growth from both the perspective of the teacher and the student. A notable limitation of this strategy is that in order to be fully prepared to teach the process most effectively, educators must spend more time on the process.

The last, and most effective, strategy involves incorporating design into pre-service teacher education programs to begin the training from early on in a teacher's certification. This would be the best way to teach the process to teachers, as the process would be incorporated into the fundamental style of teaching and would resonate closely with other teaching methods. Rather than taking time and resources later into their career to learn the process, teachers are able to learn and practice the design thinking process from an early point in their education. Additionally, teaching design thinking through teacher certification programs would allow educators to gain the skills associated with the process and help them with other facets of teaching. A study conducted at Macquarie University found that teaching design thinking during teacher certification training allowed the university to expand and accelerate other forms of curriculum (Bower et al., 2013). They observed that the design thinking process not only prepared teachers to teach the process, but it offered unique possibilities to simultaneously teach other skills teachers are required to know, such as technological integration. Not only were teachers prepared in the process of design thinking, but their other learning was accelerated by the process, leading to better equipped educators. This method would be the most effective in the long run because it would prepare all future generations of teachers and change the fundamental way educators are prepared for their role in the education system.

### *Using Design Thinking in Curriculum Design*

The first way that design thinking can be incorporated into secondary education is by using the process to help strengthen existing curriculum and design new curriculum. These strategies allow teachers to integrate the design thinking process into the classroom environment. While students do not directly learn the process through this approach, the results for students would still include greater workplace preparedness.

Using design thinking to adapt existing curriculum enables educators to actively mitigate and solve problems with the curriculum and better meet the needs of the students (Lor, 2017). The design thinking process encourages teachers to approach the curriculum in an iterative way and seek feedback consistently. Basic tools such as seeking student feedback, implementing student feedback throughout the course and asking students to reflect on learning can all have a positive impact on the teaching and learning experience. This allows educators to not only prepare their curriculum with the needs of the student closely in mind, but also to adjust curriculum as student needs change. Additionally, by consistently revisiting their curriculum, teachers have the opportunity to update material to meet the needs of a changing market. This strategy would prepare teachers to not only incorporate the needs of students but the needs of the workplace into their classroom.

The process can also be used to help design and advise new curriculum. Design thinking has been found to be helpful in the conception, design, characterization, prototyping, testing, pitching and innovation of new curriculum to redesign and strengthen classroom experiences (Lor, 2017). The process encourages teachers to empathize with the students, working to understand the needs of the students when designing curriculum. At the Faculty of Economics at the University of Ljubljana, teaching teams utilized the design thinking process in curriculum design of a business course. The course placed emphasis on user-centeredness and aimed for higher engagement in practice rather than mastering theory and writing theoretical business plans. This led to students developing a greater understanding of the system that surrounded the problem rather than just the narrowly defined problem. This also led to innovating and enhancement of the curriculum for the university course (Lor, 2017). By incorporating design thinking into classroom curriculum design, educators were able to better understand student needs and create an effective learning environment.

### *Teaching Design Thinking Directly to Students*

The second way to integrate design thinking into the education system is by teaching the process directly to students. This method relies on students using the design thinking process in conjunction with project-based learning to solve real-world problems. By solving problems in the real world, students face more realistic challenges and are able to fully understand the importance and significance of the skills of adaptability. This helps them to develop long-term habits and better prepare themselves for the future of work. To successfully implement the design thinking model into the education system, students must interact with the process regularly in order to turn practice into habit. Many school systems recognize the importance of design thinking and repeated practice, with some educational institutions and programs having successfully incorporated design thinking to foster innovative leadership education (Chong and Lee, 2016). In order to expand design thinking in the secondary education system, teachers can teach students the design thinking process directly.

One way of teaching design thinking directly to students through project-based learning is by integrating long-term projects into class curriculum. To take one example, a course called Design Thinking and Innovative Branding was developed for MBA students to combine a course on branding with the effects of design thinking. In this course, students were found to score highly in all course learning goals. In fact, students scored the highest on the course learning outcome called work in teams/collaboration (Chong and Lee, 2016). By better equipping students with skills of adaptability through the design thinking process, schools across the world have the opportunity to create an effective learning environment for their students.

Another way of integrating the process with the education system is through the creation of afterschool programs that work with students to solve real world problems. An example of such a program is Impact The



Future (ITF, 2022) which encourages students to work in small groups of peers to identify and solve a community problem with design thinking. The ITF curriculum provides templates, videos and worksheets to engage students with the design thinking process and allow them to innovate in the real world. Programs such as ITF are working to create feasible and accessible options for teachers around the world to teach students the process of design thinking. Through both afterschool initiatives and teacher-led efforts, students are able to experience real-world problem solving and directly understand the process of design thinking.

## Discussion

Through our review of secondary education, skills development and workplace literature, we identified that the current secondary education system is not adequately preparing students with the right skills for the future workplace. Learning strategies and programs such as the design thinking process can be implemented in order to address the current skills gap and better prepare students for the workplace. Two methods were identified during this process: using design thinking in curriculum design and teaching design thinking directly to students. The first method allows teachers to strengthen existing curriculum and create new curriculum that takes into account the voice and needs of the students. This method also incorporates observation of the marketplace, allowing teachers to understand how to best prepare students for the workplace. The second method teaches the process of design thinking directly to students. Students are able to work through the process and practice the skills of adaptability, including critical thinking, problem solving, collaboration and creativity; these skills allow them to better adapt to changes in the workplace. In order to best prepare students for an uncertain future, design thinking can be incorporated into secondary education by teachers and administrators.

The results found in the paper are in line with current research and demonstrate solutions to emerging problems. This paper is an extension of current literature and understanding as it discusses the connection between secondary education and the workplace. Throughout this paper, a direct connection is drawn between student skill development in secondary education and its effect on workplace cost and efficiency. This is the first review to discuss the implications of integrating design thinking into secondary education with the goal of getting students ready for the workforce. Notable strengths of the paper include its novel contribution to the current literature and providing practical methods in which the secondary education system can be changed. Some limitations faced when constructing the paper include the lack of theory in applying design thinking to education and a lack of studies that demonstrate directly how skills development can be measured. Such limitations open the door for future research; research is needed to understand how to best operationalize or define workforce readiness, how to assess the direct link between design thinking and workforce readiness and how schools can best incentivize implementing programs such as the design thinking process.

## Conclusion

Today, employees face higher job availability but a lower number of job offers. In fact, the ratio of job openings to hires has never been higher (Molla & Stewart, 2021) and this trend is continuing to grow. With the fast-paced changes seen in industries today and increased job uncertainty, skills of adaptability are now more important than ever, yet school systems largely continue to overlook their importance. In order to address these shortcomings, the secondary school system must adapt through iterative and interactive programs such as the implementation of the design thinking process. This will allow students to have a better understanding of real-world challenges and develop the skills of adaptability needed for the future. By placing the emphasis on skills rather than content, workplace productivity will increase and the learning gap will decrease. Teaching every student how to think rather than what to think is key to future success in the workplace and further innovation for our future. By means of the design thinking process, every student will be empowered to create real-world change

and be successful in any field of their choosing. Today, secondary education leaders, administrators, teachers and even students must recognize the importance of skills programs such as the design thinking process. With efforts made by all parts of the secondary education community, programs that teach skills development can be implemented to better prepare students for the future. In the field, further research is needed to better quantitatively understand the effectiveness of new skills development programs.

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