Combating Youth Unemployment: Developing an Australian Work Readiness Tool
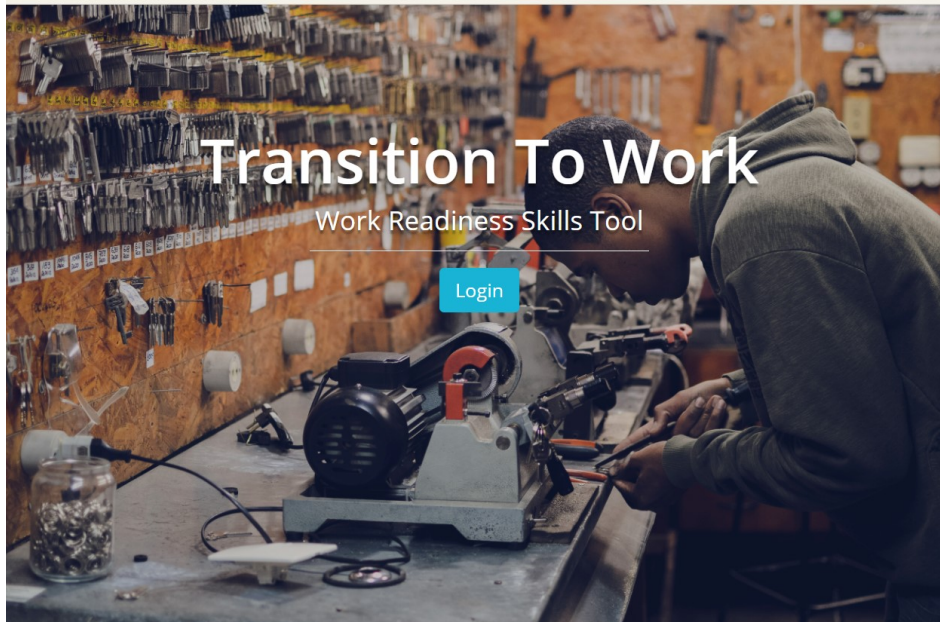
Abstract

Youth unemployment is a global problem. One major cause is a disconnect between the skills youth possess and those required by employers. This project assisted the Brotherhood of St Laurence in combating this skills gap, and consequently youth unemployment in Australia, through developing a digital work readiness skills tool. The project resulted in a website with a skills assessment and information about skills required by different industries. We conducted literature reviews to find what industries will employ the most Australians over the next five years and what skills these industries require. We then designed and tested a digitized tool that allows youth to assess their skills, visualize their growth, and match their skill set to different industries. At the close of our project we made further recommendations for future technological developments of the tool and other BSL programs.

Team Members

John Dyer
Matt Freed
Jonathan Redus
Madison Stahl

Advisors

Professor Lorraine Higgins
Professor Katherine Foo

Sponsor

The Brotherhood of St Laurence

D term
May 4, 2018

Brotherhood of St Laurence
Working for an Australia free of poverty

WPI

Youth unemployment: A global problem

Youth unemployment is a global concern with significant consequences. Youth unemployment is defined as people aged 15-24 who are searching for work. Currently, the global youth unemployment rate is 13.8%.[1] This equates to approximately 300 million people, or one in seven youth who are currently searching for work.[2;3] This is nearly three times the adult unemployment rate of 4.9%.[4] In addition, underemployment, a condition in which people are overqualified for their current position or are working part-time while seeking full-time employment, adds to the overall job crisis. It is estimated that there are 200 million underemployed youth globally.[3] Youth unemployment and underemployment are primarily caused by three factors: a skills gap, a struggling economy, and job automation. Both youth unemployment and underemployment have been associated with having detrimental effects on youth such as health issues, decreased lifetime earnings, and involvement in crime.[3]

Although a major issue throughout the world, youth unemployment and underemployment has been particularly severe for Australian citizens. In recent years, the combined rate of Australian youth unemployment and underemployment has reached 31.5%, which is the highest it has been within the past 40 years.[5] The large number of job-seekers has led to the creation of non-permanent partial jobs, with low pay and low job security. Youth have begun to lose faith in their economic mobility, and as business reporter Carrington Clarke stated, "Less than 1 in 10 young Australians think they will be more financially secure than their parents. That is compared to the 36 percent average in the developed world."[6] Solutions to youth unemployment will not come without a further understanding of the underlying issues.

In working to solve the issue, many organizations have begun to embrace a school of thought known as advantaged thinking. Advantaged thinking is centered on the idea that individuals have potential and simply have not been given the opportunities to develop, rather than the idea that they are less valuable individuals who need training to be given potential. This means that individuals can identify as potentially capable, rather than as simply disadvantaged. One organization that advocates advantaged thinking is the Brotherhood of St Laurence (BSL - see Appendix H), a public, non-profit organization that seeks to solve the issue of youth unemployment. According to Diane Brown, a research and service development manager at BSL, advantaged thinking leads to a focus on strengths of the individual; BSL's role is to provide youth the opportunity to develop their skills. However, BSL does not ignore the needs and challenges of the youth as they work on developing strengths and helping them overcome challenges they face.

One tool which BSL uses in their programs is the Work Readiness Skills Tool (WRST), portions of which are shown in Figure 1. The WRST allows youth to identify, with the assistance of a counselor, their competency in ten key skills. This is an early step in BSL's advantaged thinking-based process, as it lets youth recognize their strengths, as well as skills they can develop while in the program. While it is useful, there are a few aspects of the WRST that can be improved. The current tool is a paper form and involves substantial reading. Most participants are unable to complete the assessment on their own, especially immigrants who may have trouble understanding English. According to the Australian Bureau of Statistics, 21% of Australian households speak a language other than English at home.[7] This number is even higher in areas where BSL operates, such as Broadmeadows, VIC, where the percentage is as high as 60%.[7] Another issue with the current WRST is that participants may also have difficulties accessing their results later on, depending on where the physical copy is stored. Lastly, the current WRST does not compare the skills of the youth to the skills that employers in industry feel are important for success.

An updated and digitized work readiness tool would address these concerns. For example, to address the high number of non-native English speakers, a digital tool could have built in support for multiple languages, as well as more graphics to clarify meaning. Record keeping would also be greatly simplified, since all records would be stored in the cloud and could be accessed from anywhere within BSL's locations. Finally, the tool could compare the participant's skills to the skill level that the industry needs, which would provide the youth with a visualization of where they could best utilize their skills to ensure success. The digital tool would echo BSL's advantaged thinking approach by carefully wording the questions and using a color-coded system as opposed to numbers to rank the skill level. The color-coded skill level would prevent the participant from quantifying themselves. Rather, they choose from simple tasks that someone at the skill level would be able to do. By reflecting the advantaged thinking approach and implementing several logistical changes, the WRST would be significantly improved by transitioning to a digital platform.

Definitions:

Youth unemployment – people aged 15-24 who are actively searching for work but are unemployed

Youth underemployment – people aged 15-24 who do not have enough paid work or who are currently working a job that does not utilize their full skill set and abilities

Skills gap – a discrepancy in the skills possessed by a job candidate and the skills needed to perform the job

TtW - The Brotherhood of St Laurence's Transition to Work Program

WRST - the work readiness skills tool provided by The Brotherhood of St Laurence

Figure 1. Categories in BSL's current WRST: The circles on the left are the ranking categories, and the circles on the right are the skills, divided into hard skills in the top grouping and soft skills in the bottom grouping.

Causes, consequences, and solutions to youth unemployment

At its core, youth unemployment is a very complex problem that is the result of a variety of different factors. There are three main causes of youth unemployment in Australia: a stalled economy, the automation of jobs, and the increasing skills gap. With every cause, there is a consequence, and the unemployment of youth leads to many immediate and future effects. Due to the grim reality of youth unemployment, a number of solutions have been implemented to try to alleviate it. The following sections will highlight the causes of youth unemployment, the consequences of youth unemployment, and potential strategies for solving the problem.

Causes

This section will navigate through the three main causes of youth unemployment in Australia: the stalled economy, automation of jobs, and the skills gap. This project and the programs at BSL focus on addressing the skills gap within these larger economic shifts.

Stalled economy

The Australian economy has been on a slow and steady decline over the past years. In 2004, Australia was ranked 4th for global competitiveness by the World Economic Forum, but has recently dropped to 21st.[8] Figure 2 shows how Australia compares to other countries in global competitiveness. The World Economic Forum also ranked Australia at 107 out of 137 for its ratio of exports to GDP. This is a staggeringly low ranking for a country that supplies 35% of the world's coal and 37% of the world's iron.[10;11] China, Australia's main customer of iron and coal, has begun to cut the amount they are purchasing.
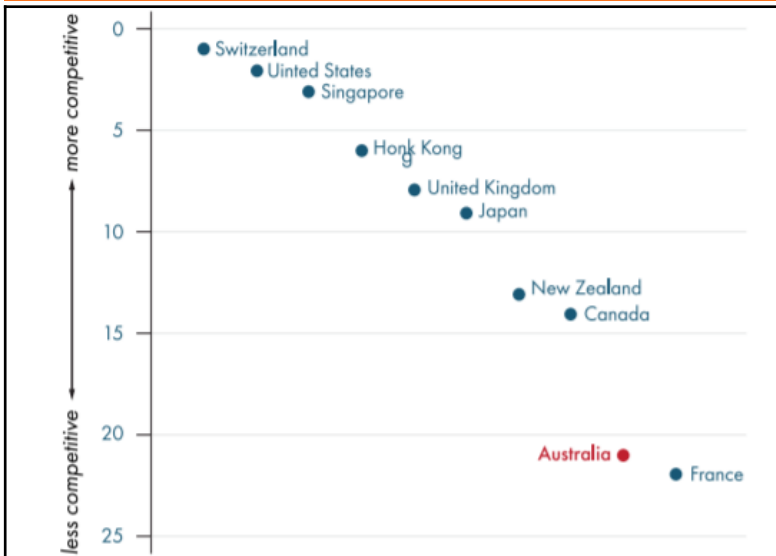
Figure 2. Global competitiveness rankings of many of the top 25 most competitive countries.[9]

Job automation

Job automation is another driving force of youth unemployment. Over the last 25 years, many basic labor and manufacturing jobs have been automated, and Australia has lost 500 thousand secretaries, 400 thousand laborers, 250 thousand tradesmen, and 100 thousand machinery workers.[16] Some economists believe that this job loss will be offset by the new jobs created by automation, as "automation has freed up resources that were previously required to undertake mundane, routine and often manual tasks, and allowed [workers] to be employed in high value, high skilled and high paid roles" (p. 2).[17] However, transitioning to an automated work environment can leave many low-skill, entry-level workers unemployed. Even if new jobs are created, the time it will take for all the displaced workers to find them will lead to an increase in unemployment, and it has been found that 1 in 10 unskilled Australian workers are highly likely to never work again after losing their job.[18] According to a report by the Committee for Economic Development of Australia, up to five million jobs are likely to be automated by 2030.[19] This means that nearly 40% of existing Australian jobs, and 60% in some rural and regional areas, are at risk of being automated, as shown in Figure 3.[19] Job automation affects youth disproportionately compared to their adult counterparts. They typically hold low-skilled jobs, in fields such as manufacturing,

construction, retail, and food services.[14] These low-skilled entry-level jobs are most susceptible to automation.[20] With fewer entry-level jobs available, youth have a more difficult time getting a foot into the workforce. They are forced to compete for a limited number of positions or pursue a costly higher education to learn the skills required for higher skilled jobs.

Skills gap

The third major contributor to youth unemployment is the skills gap, which is defined as "the difference in the skills required on the job and the actual skills possessed by the employee."[21] Thirty-five percent of Australian jobs were left unfilled in 2016-17, not due to a lack of applications, but due to a lack of applicants that matched with employers desired skill traits.[22] Youth job seekers have the potential to succeed in the job market, but there is a disconnect in identifying, training, and marketing the skills needed
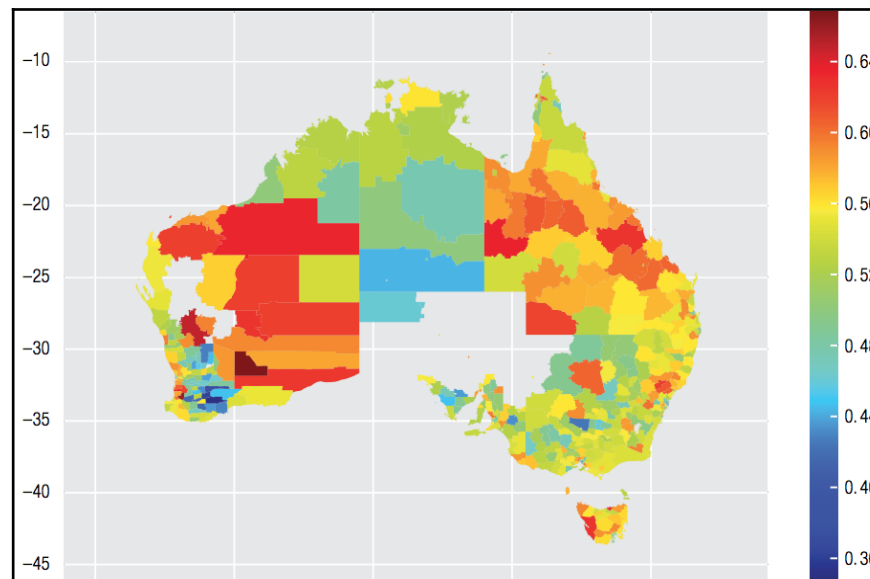
Currently, around 72% of Australian iron exports go to China.[12] China's accumulation of mass amounts of iron and coal has led to stockpiling, which has now reached a point where China no longer needs to import the amount of iron and coal that they were previously. Due to this abundance, 6% of iron and 8% of coal purchases have been cut, causing the export price of iron to decrease by 60%, and coal by 38%.[13] With prices dropping, Australia's iron and coal industries will have to streamline their companies, which will lead to job cuts. Currently, 6% of employed youth are employed in the mining industry.[14] Considering youth are statistically at higher risk of being laid off, a decrease in mining job opportunities will directly affect the youth unemployment rate drastically.[14] The declining number of traditional jobs in mining combined with "lack of robust economic growth" (p. 1).[15] is one of the main causes of youth unemployment.

Figure 3. Probability of job loss through computerization and automation in local government areas of Australia.[19]

to succeed. Due to this disconnect, new graduates are forced to look for positions they are not trained in, which has resulted in "40 percent of [university] graduates working in areas outside their field of study."[23] The Australian education system is producing talented students, but employers are not taking full advantage of the student's skills. In an index on global competitiveness produced by the World Economic Forum, Australia was ranked 9th in higher education and training, but only 28th in labor market efficiency.[8] The World Economic Forum describes labor market efficiency as a country's ability to match its workers with the most suitable jobs for their skillset. Producing graduates who are unable to market their skills to match employer's needs will only lead to a higher youth unemployment rate.

Consequences

The effects of youth unemployment are felt across almost all sectors of society in some way. Here, we focus on how youth unemployment affects the individual throughout his or her lifetime.

Health issues

As a consequence of being unemployed, youth are encountering an array of mental and physical health issues. According to The Commonwealth, "Unemployment experienced at early ages is associated with discouragement, illness, stress and depression in later life, as well as with lower life expectancy."[3] Unemployment negatively affects everyone, but youth are especially susceptible to its negative repercussions. When youth are unemployed for a prolonged amount of time, they struggle with feelings of hopelessness and low self-esteem. In a study published by *The BMJ*, a weekly peer-reviewed medical journal, 8.6% of individuals unemployed for longer than 6 months were diagnosed with a mental disorder.[24] The study concluded that "the length of unemployment appeared to increase the risk of getting a mental diagnosis, which could be an indication of a

causal relationship"(p. 384).[24] Along with mental health issues, youth unemployment is also correlated with physical health issues. The *Harvard Business Review* found that "among 47 high-income countries (as defined by the World Bank), the physical well-being of unemployed young adults between the ages of 15 to 29 is statistically tied with employed people aged 50 and older."[25] This means that unemployed youth have similar health levels as people nearly twice their age. Furthermore, Mawn et al. stated that youth unemployment increases unhealthy activities including "substance use, and suicidal behavior"(p. 2).[26] When the economy is in a poor state, the use of alcohol, smoking, and drugs become coping mechanisms for the unemployed youth.[27] In the study published by *The BMJ*, it was found that unemployed youth are at a high risk of hospitalization due to alcohol and drug disorders.[24] All of these factors lead to unemployed youth having an overall decreased life expectancy.[3]

Crime

Another consequence of youth unemployment is crime. Unemployed youth tend to participate in unhealthy criminal activities, since these can provide many of the same benefits as work such as money, community, and a sense of purpose. The World Bank's World Development Report for 2011 and 2013 suggests that "unemployed youth may provide fertile ground for gangs, violent resistance movements and criminal activities."[3] A report from Justice Policy Institute stated that areas with high youth unemployment rates tend to also experience high crime rates, as shown in Figure 4.[28] According to Rahman, youth tend to gravitate towards drug dealing,
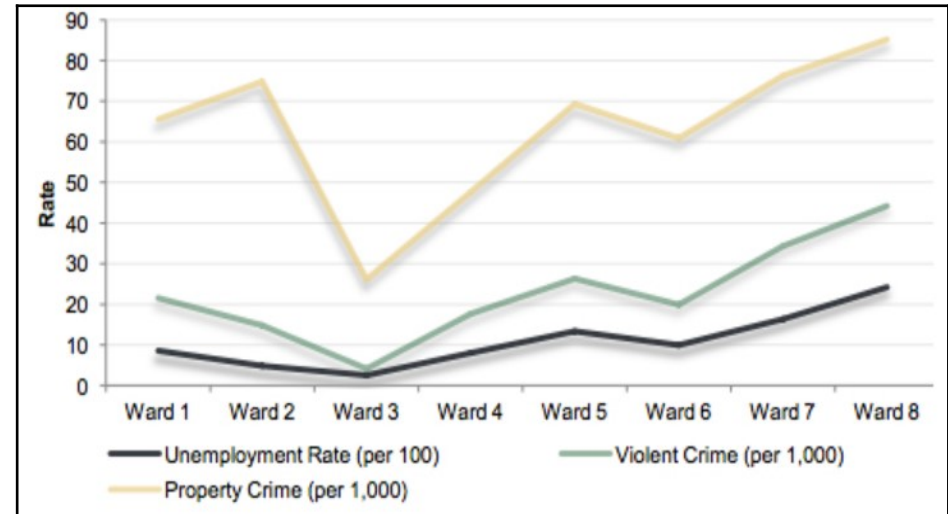

Figure 4. 2010 crime rates and unemployment rates in Washington D.C.'s wards.[28]

theft, and other types of illegal behavior when unemployed.[29] Youth have turned to gang brutality and violent protests during these times as well. The Michigan Youth Violence Prevention Center claims that, "providing employment opportunities to youth at-risk of becoming involved in gang violence has been shown to decrease gang-related criminal activity."[30] In Chicago, there is a program called the Gang Violence Reduction Strategy that aims to move gang members off the streets and into stable employment. This positive approach to preventing youth gang violence seems promising in that employment opportunities can provide these at-risk youth with professional skills, a sense of responsibility, and financial incentive.[30] Recently, there have been numerous revolutions and protests in countries around the world including Ethiopia, Egypt, and the Middle East. The common thread behind these protests and revolutions have been unemployed youth fighting for employment. In a peaceful London protest of the government's economic policies, it was found that the majority of the crowd were unemployed youth.[1] In conclusion, participating in criminal activities attracts

unemployed youth because it provides similar benefits that employment would.

Decreased lifetime earnings

Lastly, unemployed youth face the harsh reality of lower lifetime earnings. Youth that have a hard time finding a high-paying, stable job accumulate less human capital over the course of their life.[3;31] As a result, the economy is damaged: "Lost human capital also represents a loss in productivity to firms and the economy."[3] Furthermore, youth are viewed as being less loyal to a company and as a result are not hired as often while also being among the first to be fired.[6;14] This high turnover rate creates long periods of time where youth lack substantial income, which can lead to other problems. According to the Australian Human Rights Commission, "unemployment is a known contributor to youth homelessness", as "unemployed people lack the financial resources necessary to establish permanent accommodation."[32] Thus, unemployment at a young age can lead to a host of problems, ranging from inability to retire to lack of basic necessities throughout the individual's life.

Strategies for solving the problem

There are many approaches that attempt to solve the problem of youth unemployment. Solutions such as providing government financial assistance to either youth or employers, encouraging entrepreneurship, and skills-based training have been the most utilized approaches in Australia.

Government financial assistance and incentivizing employers

Government financial assistance is one of the possible solutions to alleviate youth unemployment. Through government spending on policies and programs, they can directly or indirectly affect the youth unemployment rate. One recommendation provided by Maria Pinelli, the Global Vice Chair of

Growth Markets for EY Global, is for the government to target tax and business incentives so that employers support youth employment.[33] The idea for this is to encourage the creation of youth job opportunities and in return, the employers receive monetary compensation from the government. An example of this is the Youth Jobs PaTH (Prepare-Trial-Hire) program. Employers "trial" a young person participating in the program through an internship, and the employer receives a stipend of $1,000 from the government to cover the training costs.[34] If the company hires the person at the end of the program, they may be eligible to receive up to $10,000.[34] Another recommendation, produced by the Center for Independent Studies, is to introduce local discounts to the nationally regulated pay floor.[15] This recommendation looks to provide flexibility in regions with high minimum wage requirements to encourage the employment of more workers. The Center for Independent studies believes that "high regulated wages might prevent business from hiring more staff and, consequently, job seekers from getting a fair chance to find employment"(p. 24).[15] This would directly affect youth employment in the area due to lack of overall employment. The public sector can provide assistance in decreasing youth unemployment by utilizing these strategies.

Encouraging entrepreneurship

Enabling youth to create opportunities for themselves by starting their own business is one way to overcome limited opportunities in the current job market as a significant portion of new job creation comes from entrepreneurs. Pinelli reported that, in 2015, an estimated 47% of entrepreneurs planned to hire new employees, as opposed to 29% of large corporations.[35] By practicing entrepreneurship, youth gain critical skills including the "ability to identify opportunity, take safe risks and persist through failure."[36] These skills are in high demand, which makes individuals who possess them more qualified for existing jobs in the workforce.[36] One program

targeting youth entrepreneurship is the Australian Government's New Enterprise Incentive Scheme (NEIS). This initiative provides mentorship, training, and funding to youth seeking to start their own business.[22] Over its 30 years of existence, NEIS has helped over 150,000 individuals establish successful small businesses.[37] Another program is the Encouraging Entrepreneurship and Self-Employment Initiative, launched by the Australian government in 2016. This initiative provides guidance and resources to help youth start their own businesses.[38] A notable aspect of the initiative is the Entrepreneurship Facilitators, who provide services specifically to youth in areas of high unemployment. These services include information sessions on starting a business, networking events, mentoring, and access to local market information.[39] Promoting entrepreneurship is proven to be a successful means of reducing youth unemployment.

Skills training

Skills training is a remedy to the previously mentioned skills gap. It focuses on matching the skills of the employee with the skills needed by the employer in one of two predominant ways: by increasing certain skills of the employee to match the employer's requirements, or by correlating the employer's needs with the employee's pre-existing skills. The schools of thought behind these are called disadvantaged thinking and advantaged thinking, respectively.

According to Hiemstra and Yperen, the disadvantaged thinking approach is where the trainee identifies perceived shortcomings and selects professional development activities to improve those shortcomings.[40] This approach, while common, can cause issues since it assumes the individual to be deficient in useful skills. Negative feedback is inherent to the deficit approach, and according to Vallerand and Reid, "negative feedback decreases … intrinsic motivation"(p. 2).[41] This in turn leads to lower academic achievement or skill development.[42]

Disadvantaged thinking also assumes that the fault or cause of the problem is within an individual and ignores any social or economic barriers that the individual might face. One common example of disadvantaged thinking is self-help books, where the focus of the book is not on what the individual is doing right, but what they are doing wrong, and does not account for any of the underlying factors that may be present.

Meanwhile, in an advantaged thinking-based approach, as described by Hiemstra and Yperen, the trainee identifies and develops their talents.[40] The concept of advantaged-based thinking "moves away from deficit, disadvantaged or problem-focused thinking, towards advantaged thinking and acting"(p. 17).[43] This approach focuses on an individual's pre-existing strengths, and according to Wood, Linley, Maltby, Kashdan, and Hurling, people who use advantaged thinking develop "greater levels of well-being over time"(p. 17).[44] In turn, well-being is correlated with academic achievement, as Lv et al. showed in their study.[45] Furthermore, Fishbach, Eyal, and Finkelstein state that focusing on the positives of one's ability "increases people's confidence that they are able to pursue their goals, leading people to expect successful goal attainment"(p. 517).[46] This expectation increases motivation, which, as discussed previously, is correlated with academic achievement. An approach which incorporates advantaged thinking also provides resources for people to develop skills that they have not previously developed. These underdeveloped skills are not considered to be the fault of the individual, but rather due to an absence of opportunity in their environment. An example of an assessment which uses advantaged thinking is the online CliftonStrengths Assessment. This assessment asks participants to select statements that best describe them and uses their responses to determine their top five strengths.[47] It then provides recommendations of how they can use these skills to succeed and what careers they might be best suited for.[47] Thus, skills training, combined with advantaged thinking, can help address the issue of youth unemployment by further developing the skills of youth.

Limitations of the current strategies

Increasing government spending on the problem of youth unemployment is a simple approach which still requires other complementary methods. It does not directly affect the root cause of unemployment. Creating tax breaks to encourage employment or altering minimum wage requirements does not give youth the skills needed to succeed in the job market but does provide short term assistance. Thus, while government spending can deal with some of the effects of youth unemployment, other strategies must be incorporated to solve the underlying problem.

Encouraging entrepreneurship is a method of relieving youth unemployment with a record of success. However, current implementations are limited in scale, given the complexity and cost. This means that while it can assist some unemployed youth, it cannot help all of them.

Skills training can alleviate youth unemployment by giving them the skills needed to succeed in the job market. Current skills training methods utilize disadvantaged thinking, and as previously discussed, this has several drawbacks. It lowers the motivation of the trainee, which in turns limits their skills development. In contrast, advantaged thinking increases both motivation and well-being, which leads the trainee to successfully sharpen their pre-existing skills. However, even after working to develop their skills, many youth lack understanding of how their skills can translate into a successful career. As the Youth Action & Policy Association stated, "careers advice in school also lacks a direct link with industry, meaning students are not receiving solid intelligence about where the jobs are now and where they are likely to be in future."[48] Utilizing advantaged thinking and collaborating with employers would be a better approach to alleviating youth unemployment.

Addressing the issue: Our three-objective approach

A decrease in youth unemployment is beneficial to all. The Australian government values a decrease in youth unemployment because it quantitatively shows a flourishing job market, which is a beacon of economic growth. Also, a decrease in youth unemployment lowers the amount of welfare and funding required, decreases crime rates, and improves the health of youth. Most importantly, youth benefit the most from a low unemployment rate, since it would allow them to gain experience in the job market and develop their skills earlier in their careers, so they could be more successful throughout their lifetime. One area of particular interest is in developing skills training tools. BSL currently utilizes a WRST which combines advantaged thinking and employer collaboration to create a more useful skills training program.

We are collaborating with BSL to digitize the WRST which they use in their Transition to Work (TtW) program for youth. We will determine the skills required for youth to succeed in the top, job-producing industries, adapt the work readiness tool to appeal to youth, and create a digital prototype of the tool (Figure 5). A digitized work readiness tool that

Determine Skills	Adapt Tool	Create Prototype
Determine the skill levels required to be successful in the projected top five industries	Adapt the current work readiness tool to appeal to youth and increase usability	Produce and test a fluent digital prototype of the tool, with thorough documentation

Figure 5. The 3-objective approach used in the project.

allows users to compare their abilities with the abilities employers are looking for will allow youth to target skill development so that they can be more employable. Furthermore, it will allow BSL to analyze the effectiveness of their strategies and refine their operations to help disadvantaged youth succeed.

Development of a digital skills tool: Methods and results

This project helped BSL with their Transition to Work skills training program by digitizing their WRST. This tool will allow young adults to develop their skills for a constantly evolving job market. Although the Brotherhood of St Laurence has a national profile, our project work was based in its Melbourne offices.

We called on several methodologies (see orange boxes, Figure 6) to achieve our three objectives. These methods were approved by WPI's IRB and by BSL. First, we determined the five industries projected to employ the most people over the next five years and the skills required to be successful in these industries. Second, we designed a digital version of The Brotherhood of St Laurence's current work readiness tool to reflect the current job market, be simple to use, and appeal toward users. Lastly, we produced and tested a fluent digital prototype of the tool. The tool was accompanied by thorough documentation of our findings and research so that The Brotherhood of St Laurence may continue to contribute to this project in the future. This chapter will focus on how we achieved our objectives by using tools such as literature reviews, focus groups, and user testing.
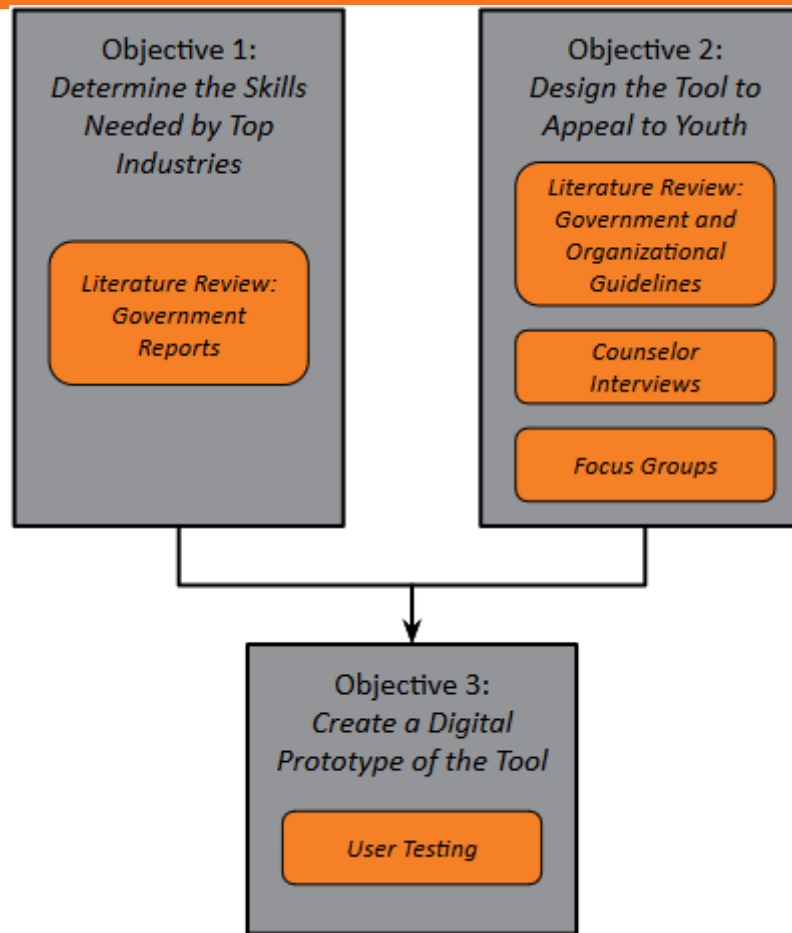

Figure 6: Methods used to achieve our objectives.

Objective 1: Determine the skills

The first objective was to determine the skills that will be needed for jobs in the top five employing industries in Australia over the next five years.

Methods for objective 1

To identify the projected top employers, we reviewed government projections as well as current market trends. Our primary source was the Australian

Government Department of Jobs and Small Businesses website.[49] Within this site, we located the Labour Market Information Portal, which provided a spreadsheet on the industry projections over the next five years. This source was extremely thorough, with hundreds of different industries divided into primary, secondary, and tertiary subsections. To determine the top five employing industries, we looked at the projected number of jobs added and found the top five primary industries that had the highest growth.

To identify the skills these industries require, we consulted the Australian Government's Job Outlook website, which listed the skills that workers in a particular job felt were important.[50] We looked at jobs within the previously identified industries and found what skills from the WRST these jobs require. We did this by matching the skills on the site to the skills listed in the WRST and noting, on a scale of one to five, how highly workers had rated each skill. Then, we averaged the ranking for each skill across the jobs researched for an industry, and found the standard deviation for each skill. We considered a standard deviation less than one as an accurate representation of the skills required for the industry. While analyzing the results, we found that the standard deviation of two skills were greater than one: reading and flexibility in construction. Once we did more research in these two categories, the standard deviation of all the results was brought to be one or less.

Results for objective 1

The five industries projected to employ the most people were Accommodation and Food Services, Construction, Education and Training, Healthcare and Social Assistance, and Professional, Technical, and Scientific Services (Figure 7). A partial version of this spreadsheet, focusing on these industries, can be found in Appendix C. The skills need for these industries appear in Table 1. More details about the skills needed for different jobs within each industry are included in Appendix C.
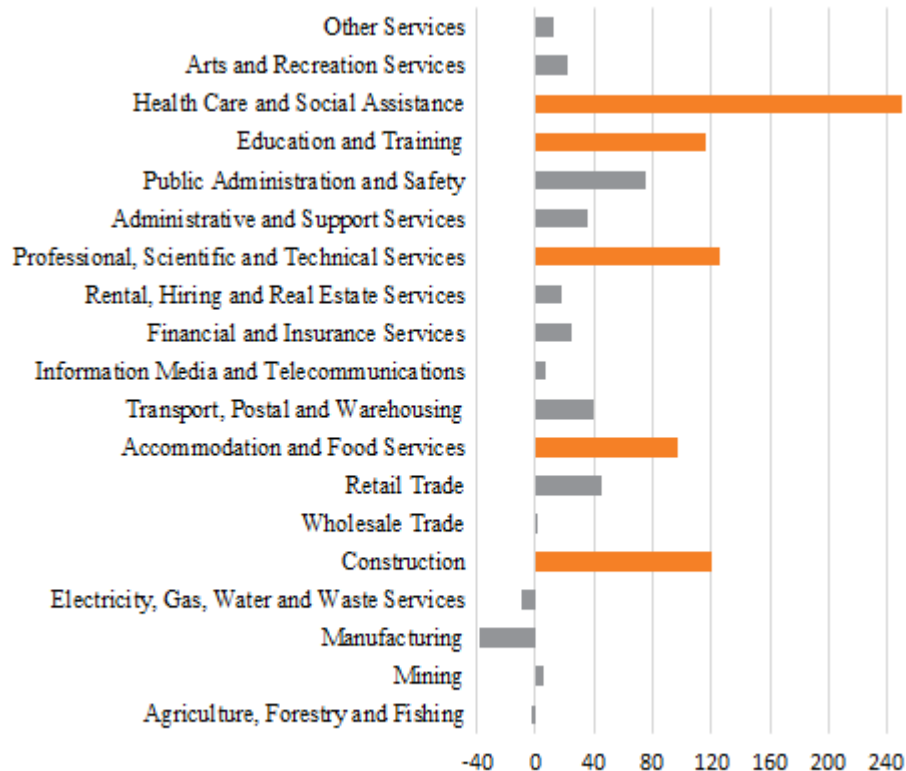
Figure 7: Projected growth, in thousands, for generalized industries in Australia between 2017 and 2022.[49]

Objective 2: Design the tool

The next objective was to create a preliminary design for the content and visual reports for the digital tool so that they would appeal to youth and be easy to comprehend.

Methods for objective 2

Our team identified what makes an online tool "user-friendly" by examining the usability guidelines provided by Usability.gov.[51] These guidelines contain 18 sections on usability, ranging from initial design process to user testing. Our team focused on sections related to optimizing the user experience, page layout, navigation, graphics, and images. In addition to the usability guidelines, we also reviewed the style guide and government accessibility regulations provided to us by BSL to ensure that the designs complied with their disability requirements, color scheme, font selection, and graphics. Our objective was to keep the design simple yet visually attractive to appeal to the user.[52]

Using the principles we learned in these resources, we then converted the existing written tool into a digitized web-based format. Then, our team conducted two focus groups assembled by BSL in Broadmeadows, VIC. The first focus group contained eight potential youth WRST users, and the second contained eight youth advisors who assist other youth throughout navigation and completion of the WRST. The format we used for the focus groups contained an introduction to ourselves and our study, followed by with a series of open-ended discussion questions addressing layout, page navigation, and visuals. The full format for the focus group can be found in Appendix B, and the transcripts can be found in Appendix D.

We also worked with BSL Youth Development Counselors (YDCs) to design the tool. First, we met with them to discuss how they currently use the tool.

Table 1: Average importance ranking of the 10 skills in each of the top five industries (where one is the least important and five is the most important)

	Accommodation and Food Services	Construction	Education and Training	Health and Social Assistance	Professional, Technical, and Scientific Services
Reading	3	3	4	4	4
Writing	2	2	3	3	4
Numeracy	2	3	2	3	4
Digital Literacy	2	2	2	2	4
Speaking and Listening	5	4	5	5	4
Flexibility	3	2	3	3	2
Initiative	3	2	3	3	2
Problem Solving	3	5	4	4	4
Planning and Organising	3	3	4	3	4
Self-Awareness	2	1	4	3	2

Then, we conducted an informal focus group with several of them, showing our initial webpages and asking a similar set of questions about the design and layout. This provided us with feedback from another group of users with a very different perspective.

In addition to these formal focus groups, out team showed our templates to other BSL representatives who are not YDCs, including our liaisons, in an informal setting. This ensured that we had comprehensive feedback on our templates. Our team then made changes to our designs based on the input of these different users.

Results for objective 2

The usability guidelines and style guide provided the base for the design of the tool. The style guide established the font type and basic color scheme to use. However, since this did not provide enough colors for all of the visuals, we also used Adobe Kuler to find more matching colors.[53] The government usability guidelines provided information on minimum font sizes, as well as limitations on visuals which could cause epileptic seizures. With this established, an initial design for the tool was created, which included a sign in page, assessment pages, and results pages. Some of the visuals are included on the following pages.

Next, we conducted our focus groups, according to the procedure outlined above. We had two focus groups—one with eight potential users who had never seen the WRST before, and one with eight potential users who had worked with BSL on the WRST previously. In the following paragraphs, we cover what lessons were learned from these focus groups.

How did participants respond to the radar chart vs. bar graph for presenting single skill assessment results?

When presented the radar chart for a single assessment results (Figure 8), both focus groups agreed that it was slightly overwhelming. Upon presenting the second graph, the bar chart (Figure 9), both
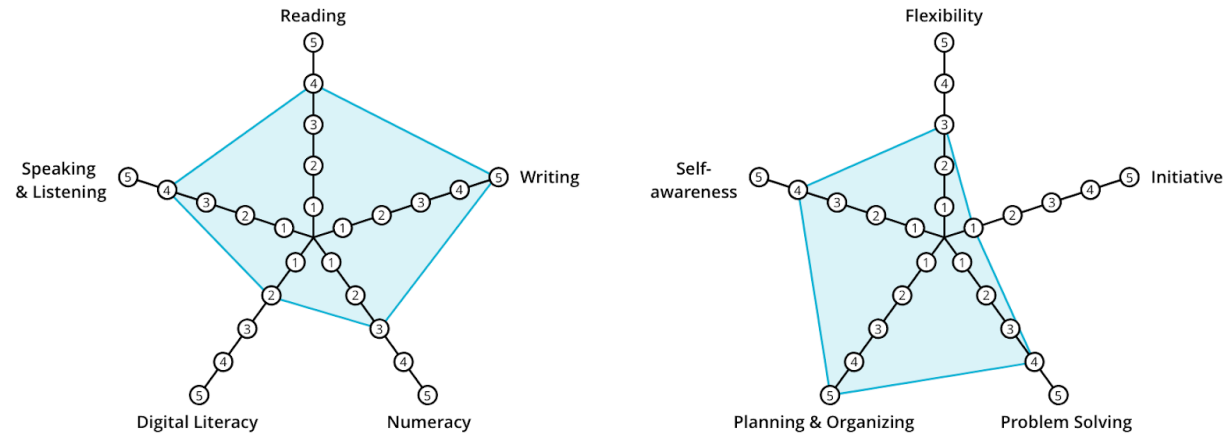

Figure 8: Initial radar chart design representing single skill level assessment.

groups agreed that this graph was much simpler to understand. One participant said this was because the bar chart "is more familiar as it is used more in math." Radar charts are not common therefore required

Figure 9: Initial bar graph design representing single skill level assessment.

participants to analyze the visual for a longer time to fully understand what the data represented. A recommendation presented by another participant was to color code the graphs to help reflect the skill levels.
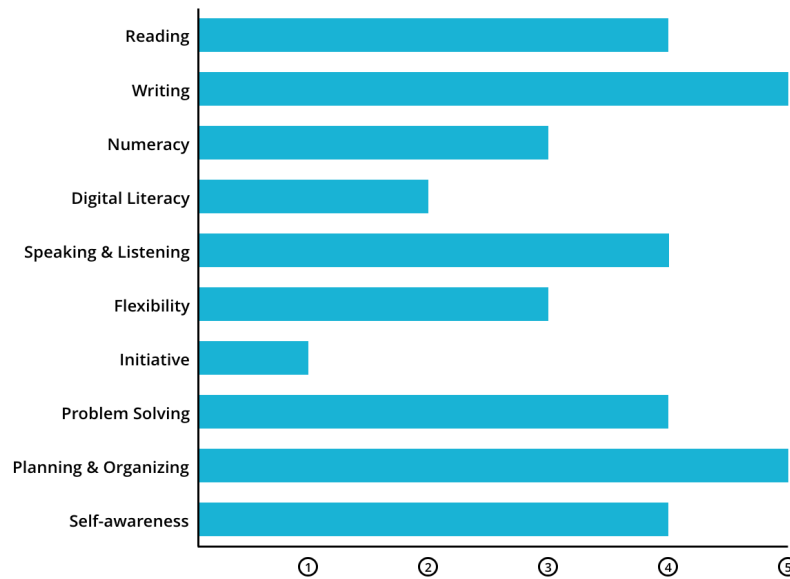
How did participants respond to the various visuals for presenting skill growth over time via multiple assessments?

We then presented three types of designs (radar charts, bar graphs, and line graphs) that we had created to express the user's skills growth over multiple assessments. The first design utilized the radar chart (Figure 10) again. Focus group 1, the potential WRST users, felt that this representation was understandable for growth. Focus group 2 had mixed feelings with one participant saying that, "It is too complicated", while another said, "It is better for comparing rather than being on its own because you can see it extend." Upon showing our second comparison chart, the bar graph (Figure 11), the first focus group agreed that it was still a simpler representation of the multiple data
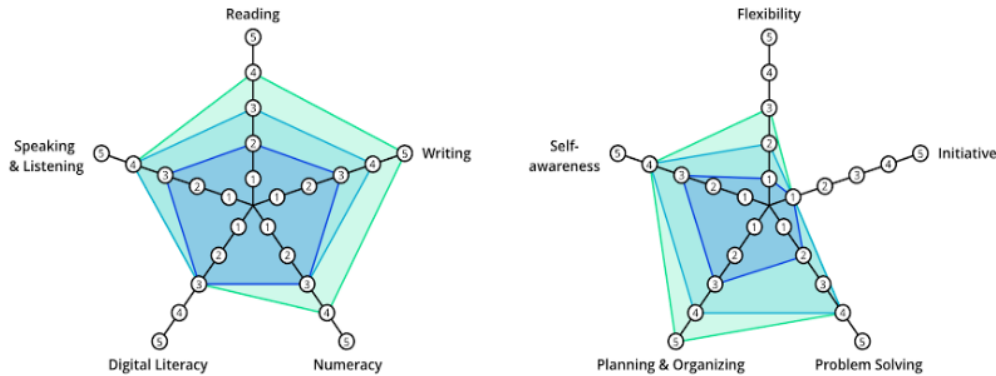
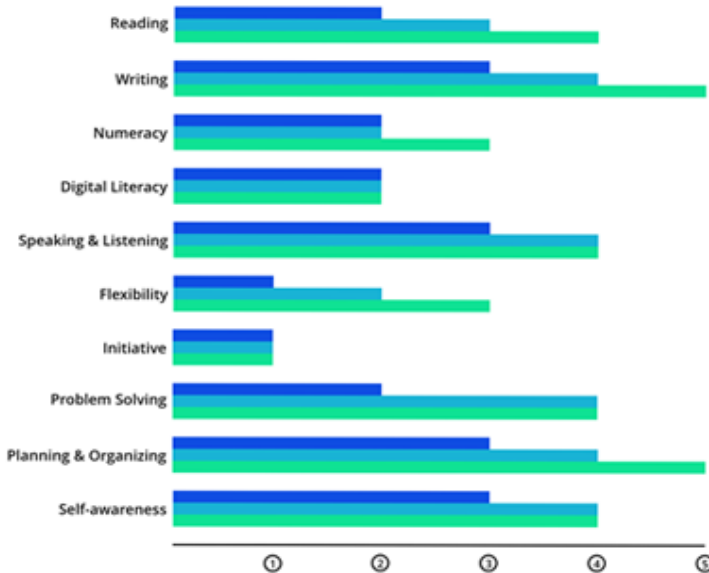Figure 10: Initial design for multiple assessment radar chart.

Figure 12: Initial design for multiple assessment line graph.

Figure 11: Initial design for multiple assessment bar graph.
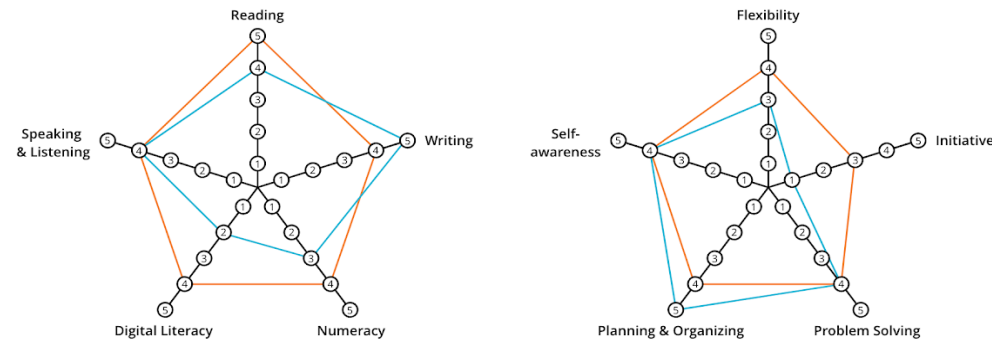
Figure 13: Initial design for industry comparison radar chart.

Figure 14: Initial design for industry comparison bar graph.

time. Both focus groups agreed that they liked the line graph, but they also said that they like the bar graph a little more because the line graph did not show all the skills at the same time.

How did participants respond to the radar chart vs. bar graph visuals for presenting industry skill comparisons?

These two graphs compared the user's skills assessment with the skills required by the top five employing industries. We only showed our industry comparison page to focus group 2. We presented both the radar chart representation (Figure 13) and the bar graph representation (Figure 14) and the feedback echoed our previous questions. The responses were mixed, with some preferring the radar chart and some preferring the bar graph.
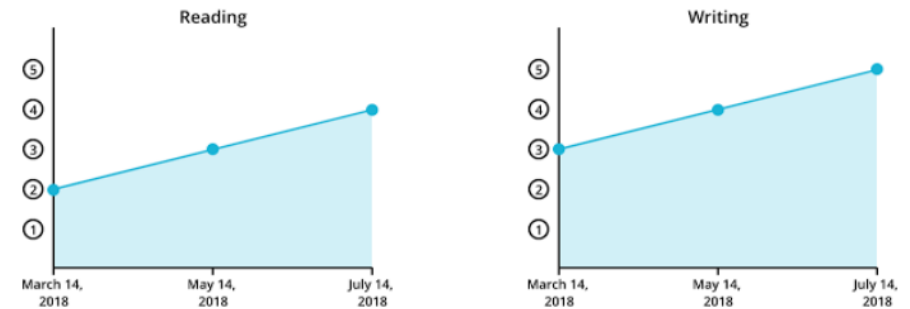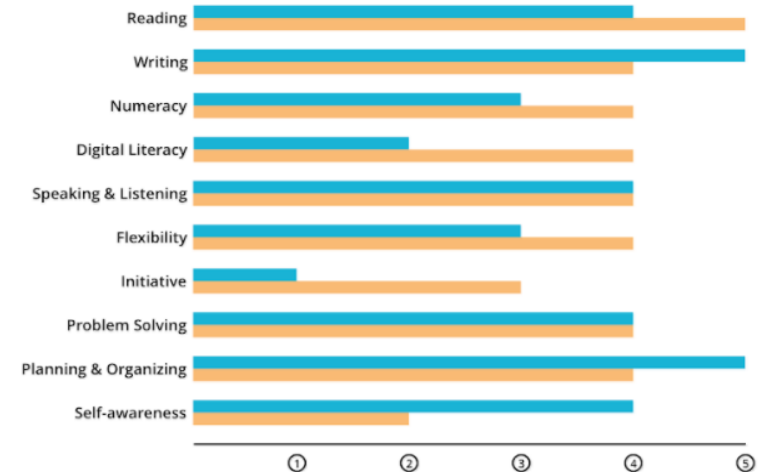
sets. Focus group 1 only had an issue with the color scheme of the graphs, describing the colors as being too close together in hue. Focus group 2 had mixed reactions to the multi-data bar chart, with responses ranging from, "Yes, I think it is simpler" to " No, the other one shows growth better." The final multi-data graph we showed to the focus groups was a line graph (Figure 12) that represented each skills growth over

At the end of the focus group periods, our group came to a consensus that we should include options for both bar graph and radar chart on the WRST. We decided to include both visualizations due to the mixed responses gathered and to cater to what the mentors and potential users are familiar with. The WRST defaults to the bar chart option to provide the user with what was decided to be the easiest understanding graphical representation of their skill levels. We also changed the color scheme as mentioned by some of our focus group participants.

Along with focus groups, our team conducted an informal review of the current tool with WRST mentors. Their main request was for us to switch the skill assessment from being number based (Figure 15) to color based. This change aligns with the advantaged thinking approach. By removing the numbers, we eliminate the sense that users are "grading" themselves, which can lead the user to inaccurately select an option. For example, a user could see the numbers and assume that they are more skilled in a certain area than they really are. Conversely, a participant could not be as confident in their skills and rate themselves lower than where their true skill set lies. By changing to colors, the urge for participants to inaccurately rate themselves is diminished. Now, participants must select the examples for each color to see what someone at that skill level can do. Participants are now required to reflect on their own skills and abilities to select an option that best suits their skill set. The color system is much more reflective of BSL's advantaged thinking approach and eliminates participants quantifying themselves with a number-based system.

Lastly, they requested that we change spellings on the website from American-English to Australian-English, all logos to the National Community of Practice logo, and phrasing to reflect the advantaged thinking approach. The rephrasing included doing away with the word "assessment" and changing the word "level" to "option" throughout the tool.

Objective 3: Digitize the tool

The last objective was to create the digital version of the tool with thorough documentation, using the previously determined design.

Methods for objective 3

The first question we addressed before building this digital tool was what technologies, programming languages, and frameworks we were to use. To answer this, we first examined the technologies that BSL already used. We decided to use Amazon Web Services (AWS) to host our web application and store data in the Sydney region, because BSL required the data to be stored on an Information Security Registered Assessors Program (IRAP) accredited service. The AWS services we used included EC2 to run our Node.js server, Cognito for user authentication, DynamoDB to store data, S3 to store the website files, Elastic Beanstalk to manage our EC2 instances and deploy the site, and Route 53 to manage the domain name. To create the front end of the tool, we used HTML, CSS, and JavaScript, which are commonly used for websites, along with the Bootstrap 4 and Chart.js libraries.

Once we identified the technologies we would use, we built the digital prototype and conducted two rounds of user testing with a total of five users so that we could assess the fluidity and usability of the tool and identify areas for improvement. Two members of our team met with one young person in BSL's TtW program at a time and noted whether they had used the tool before and if they were accompanied by a counsellor. We introduced ourselves and the study and went over the basics of what they would be doing: completing the assessment during round one and registering themselves, signing in, and completing the assessment for round two. While the participant was using the tool on a computer, we made notes on a number of things, including if they were able to complete the skills assessment without assistance, where they got stuck, and any technical bugs or issues that arose. More details on the format for the user testing, as well as the evaluation sheet used and evaluations for each participant with data on how well that they could use the tool can be found in Appendix B and E. Additionally, we asked follow up questions about what they found challenging, what they liked, and what they would change. At the conclusion of our testing, we used the results to make changes to the tool which we will elaborate on in the following section. We thoroughly documented both our code and our results from user testing so that BSL would be able to continue developing the digital tool after the completion of our project.
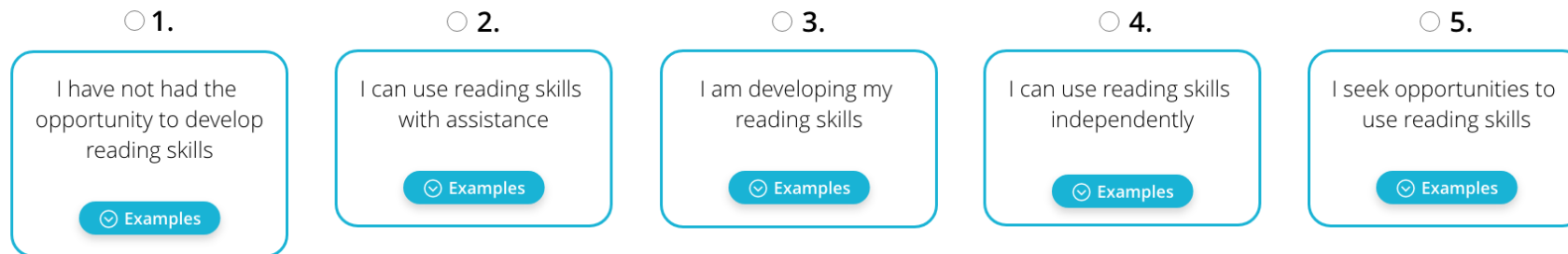

Figure 15: Initial design for skills tool.

Results for objective 3

Once we had changed the tool based on the feedback from the focus groups and counsellors, we began user testing. We divided the testing into two rounds: the first focused on finalizing the user interface, while the second round evaluated the database's ability to store data.

For the first round, we had three users test the tool. None of the users remembered using the paper version of the WRST. They took the assessment with no significant issues and could successfully interpret their results and navigate the tool. One user had a few questions including, "What does digital literacy mean?" and "What box is average?". After explaining to the user what digital literacy meant and that the examples button provides more information, the user proceeded throughout the tool smoothly. Both of these are clarifications which a counsellor would typically make, so these comments do not indicate a problem with the tool. We also noticed that the users used the examples button rather sparingly. Two of the three users started clicking on the examples button around question three and one user had to be prompted. We observed that because the users were not truly assessing themselves for TtW, they proceeded through the assessment quickly, not answering the questions as thoughtfully as they might have if they were taking it to see their results. We believe this is the cause for them using the examples button sparingly. However, in the directions for the tool, it explicitly stated that the user could click on the examples button for more info, so we believe that participants taking the tool for TtW will understand how to use the examples. All three users easily navigated from one question to the next.

When they finished the assessment and examined their results, we asked them a few questions about the different graphs including which one they liked better and if they felt it was easy to use. Their comments on the different graphs aligned with what we found in the focus groups, with one user saying that the radar chart was "really hard," and another saying that they "understand the radar chart," but admitting that "other people would think bar graph would be simpler." The users also suggested a few changes which we implemented — moving the assessment instructions to the "Start Assessment" page and making the header menu for the "Industry" pages stay fixed to the top of the screen, so users would not have to scroll to the top to switch between pages.

In the second round, we focused on ensuring that users could sign up and that the site would hold their data. We had two users, and both had taken the paper form of the assessment previously. This test involved testing the user registration and login process. While doing this, one of the users tried to use the dropdown menu to mark their birthdate, and we found that this drop down menu was very confusing. We also ran into a bug when the users started their assessment — the text fields for all questions in the assessment did not appear, meaning that the assessment was not usable. After checking the error codes, we found that we had used a recently created function in one location of our code, which did not exist on older versions of browsers. Thus, on the computers at BSL, the assessment would not work. To fix this, we used a different function which was fully compatible with older browsers. After these adjustments, the login process and data storage were both verified to be fully functional.

Despite the low number of users for user testing, we felt confident that the tool was easy to use and had no major bugs. This is because the results of our testing were generally consistent, and we had also conducted focus groups to ensure that the tool would appeal to youth.

Deliverables

The main deliverable of this project was the digital WRST. The following pages (Figures 16- 24) contains many of the pages on the digital WRST, with some explanations, as well as the instructions provided to help Administrators operate the tool.

Instructions for the digital WRST

We created a user manual for the digital WRST (Figure 24) to provide guidance in case users could not figure out how to use the site. The manual has instructions for users and administrators, and covers every option on every page. The user manual is included in Appendix F. We also created a developer manual (Figure 25) to help developers maintain the tool. This manual includes instructions on how to deploy the server to AWS, and an overview of the subsections of the tool. The developer manual is included in Appendix G.

Figure 16: Home page and login process, with notes on functionality.
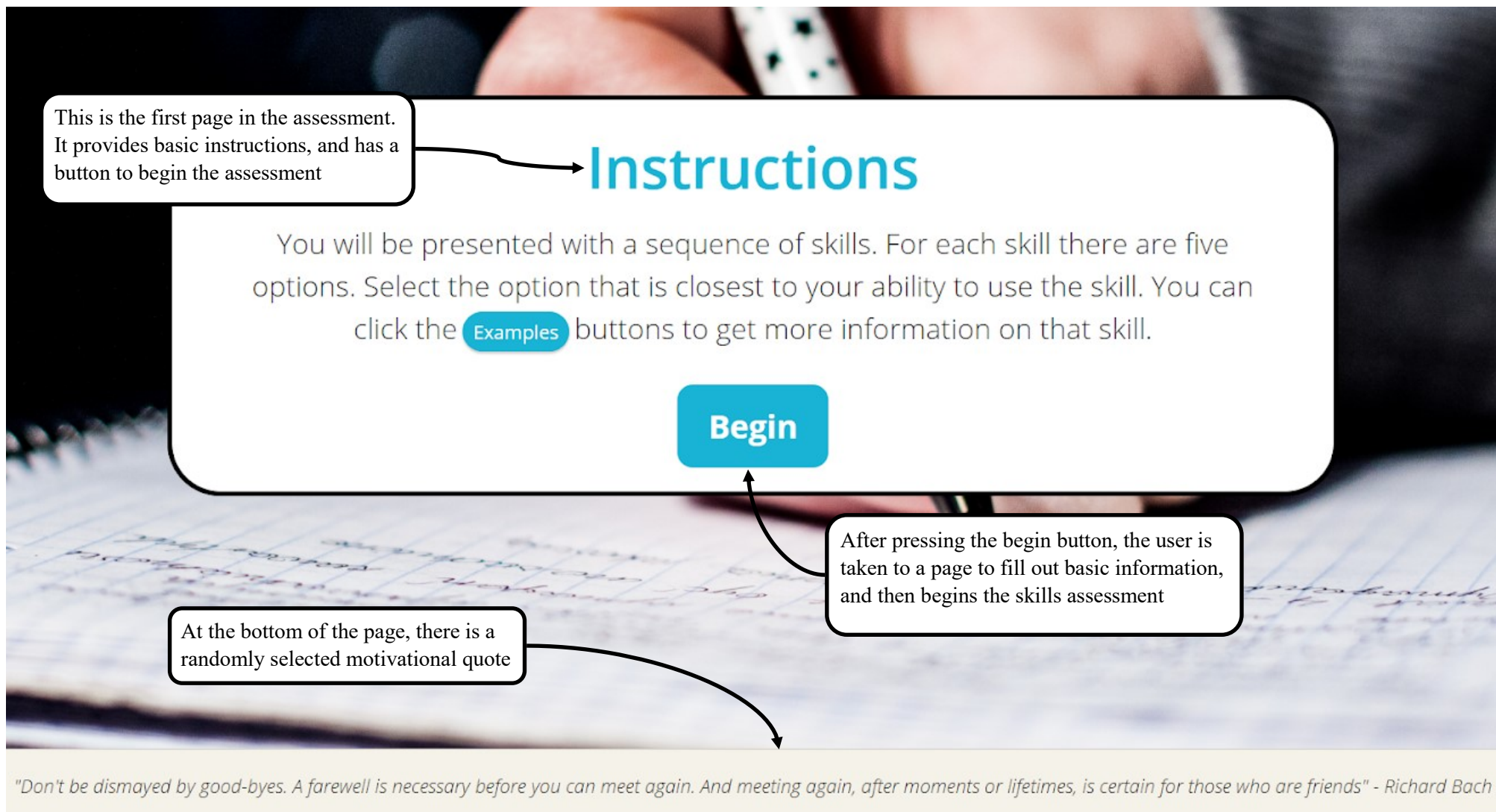
Figure 17: Instruction page, with notes on functionality.

Figure 18: The assessment page of the WRST, with notes on functionality.

Skill Results

Once the user completes the assessment, they are taken to this page, to see their results

Select a Completed Skill Tool

Assessment 1 - Apr 20, 2018

Select Chart Type

Bar Chart

The default is for the results to display on a bar graph, but can also be displayed on a radar chart, using the dropdown menu

(1) I have not had the opportunity to develop this skill
(2) I can use this skill with assistance
(3) I am developing this skill
(4) I can use this skill independently
(5) I seek opportunities to use this skill

A key is provided, to correlate the skill level with the color used in the graph and assessment

Writing
Numeracy
Digital Literacy
Speaking & Listening
Flexibility
Initiative
Problem Solving
Planning & Organising
Self-awareness

The radar chart is broken into two parts: the left for soft skills, and the right for hard skills

Reading
Speaking & Listening
Writing
Digital Literacy
Numeracy

Flexibility
Self-awareness
Initiative
Planning & Organising
Problem Solving

On both charts, the lines are labeled, to help users understand their scores

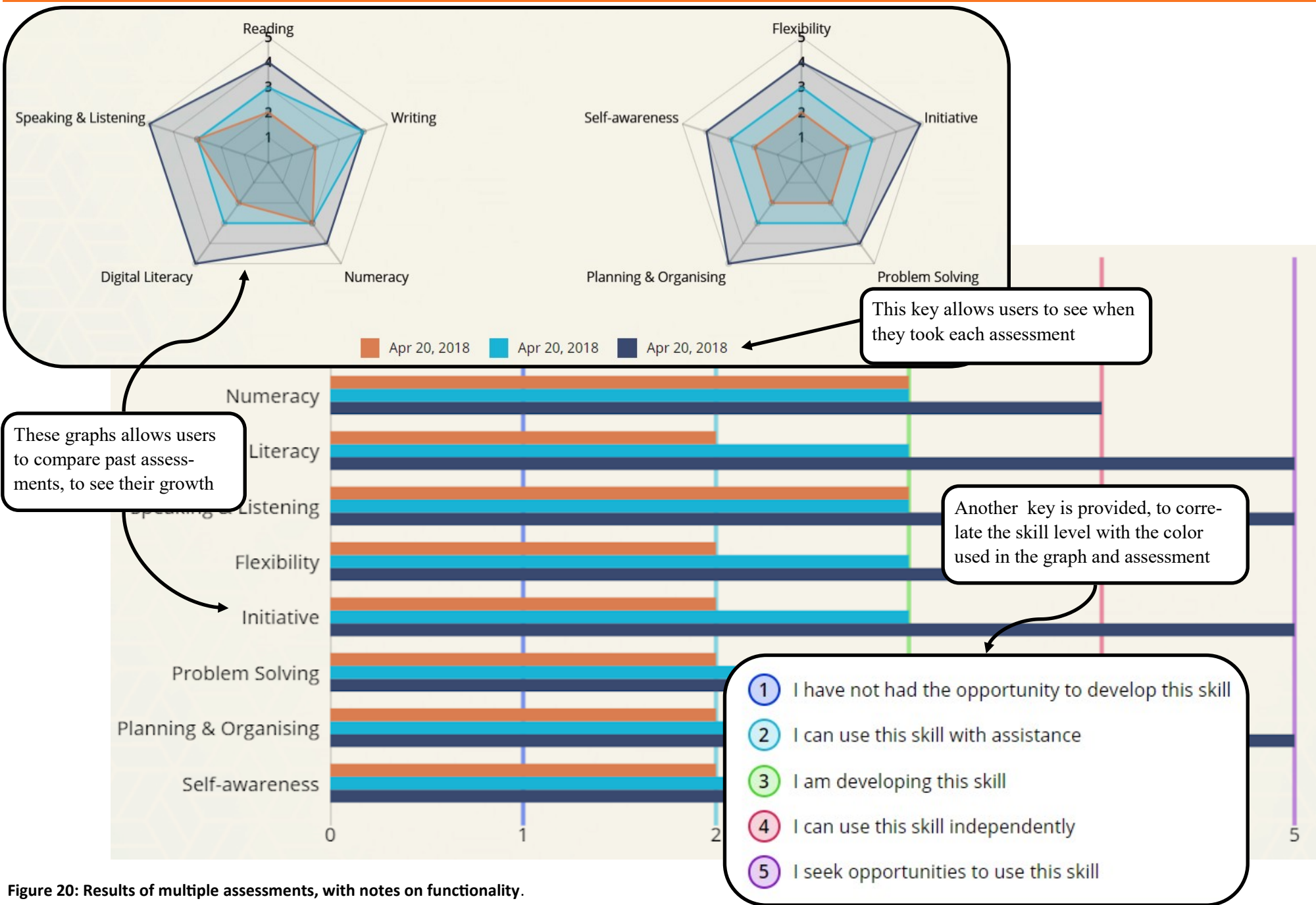**Figure 19: Results of a single assessment, with notes on functionality.**

Figure 20: Results of multiple assessments, with notes on functionality.

Reading

Writing

Numeracy

Digital Literacy

Speaking & Listening

Flexibility

Initiative

Problem Solving

Planning & Organising

Self-awareness

0

① I have not had the opportunity to develop this skill

② I can use this skill with assista

③ I am developing this skill

④ I can

⑤ I seek

These keys are provided to correlate the skill level with the color used in the graph and assessment

① This skill is not re

② Basic level of skill required for entry-level positions

③ Intermediate level of skill required for entry-level positions

④ Advanced level of skill required for entry-level positions

⑤ Expert level of skill required for entry-level positions

These graphs allow the user to compare their skill levels against the average for different industries

This key allows users to distinguish between their skill levels and the industry skill levels

Reading
Speaking & Listening
Digital Literacy
Numeracy
Writing

Flexibility
Self-awareness
Planning & Organising
Initiative
Problem Solving

My ability to use these skills   Importance of these skills to industry

Figure 21: Results of assessment compared to results of an industry, with notes on functionality.

Page 18

This page shows details about industries

This page can be accessed by pressing the industries tab, then selecting an industry

Skills Tool   Records ▾   Industries ▾   About

🍴 Accommodation and Food Services

🛣 Construction

🎓 Education and Training

💼 Health Care and Social Assistance

🖥 Professional, Scientific and Technical Services

Accommodation ar

This industry provides many entry level and part time jobs. Candidates should enjoy working with customers, since many of these jobs deal directly with them. Provided below are a few of the careers that belong to this industry.

For a complete list of jobs under this industry and a further exploration of industries please select **here**

Growing jobs within the industry are listed with a short description and some images

Growing jobs within the industry are listed with a short description and some images

Career Examples

Actors and Other Entertainers

These workers entertain people through the performing arts, such as dancing and acting.

Figure 22: Industry page, with notes on functionality.

Figure 23: Administrator control page, with notes on functionality.

WRST User Manual

Contents

Admin:

1. Creating Basic Users
2. Creating Administrator Accounts
3. Deleting Users
4. Downloading Data

Information Technology/Server:

1. Accessing User Pools (Users and Administrators)
2. Creating Users/Admins
3. Deleting Users/Admins
4. Server Information and More

WRST Developer Manual

Contents

1. Overview of app contents
2. Running the app locally
3. Deploying to AWS
4. Overview of DynamoDB
5. Overview of Cognito
6. Overview of Scripts

Figure 24: Cover of the WRST User Manual and Table of Contents.

Figure 25: Cover of the WRST Developer Manual and Table of Contents.

Finalization of the WRST

The prototype of the WRST has been completed by our team along with fully functioning data collection and user verification. Although completed, our team considers this a prototype and has recommendations for the finalizations of the official tool.

Verification of security and performance

As part of this project, we developed a successful and functional prototype of the digital WRST. However, there is still a great deal that could be done in terms of development. The most important step going forward is to have professional developers inspect the application to ensure that it is secure, fully compliant with IRAP standards, and performant. Security and IRAP compliance are essential because the government requires personal data to be properly protected, and performance is important because it allows more people to use the tool at one time and reduces costs. We made sure that all AWS services used were IRAP approved, all data stored is located on AWS servers in the Sydney region, and that we did not store any highly sensitive data such as Job Seeker IDs. In addition, we only used popular, trusted libraries in our code, and followed secure programming practices to the best of our abilities.

However, the main focus of the project was to implement and thoroughly test functionality, so that when we left, BSL would have a complete tool that they could begin to test with a limited number of users. We do not have as much experience as professional developers, and none of us have used AWS before this project. When configuring many of the services, we used default settings, as we did not have the prior experience required to fully understand the available options. In addition, to minimize costs while testing, we set certain limits on what resources our app could use, such as a single EC2 server

instance of the smallest size. These limits should be revised in order to ensure that the application can scale well and handle the number of users that will use it. Lastly, as the price of many AWS services is based on usage, refactoring the code to minimize the number of requests sent to AWS services would likely help reduce the incurred cost of running the tool.

We are confident that the prototype is secure and reliable enough to be tested with a limited number of users to evaluate the rationale behind a digital WRST. However, we do not recommend that the tool be used in the actual TtW program until it has been assessed by professional web developers experienced with AWS and found to be fully IRAP compliant.

Suggestions to improve security

One specific suggestion we have for developers to improve the security of the application is to add different AWS Cognito User Pools for members of the different organizations, and for different roles, such as Youth Development Coaches or other TtW staff. Currently we only have two user pools: one for TtW participants in all the organizations, and one for administrators in all the organizations. This means that anyone who is an administrator in any of the organizations has the ability to create users, delete users, and download user assessment data across all the organizations. The application would be more secure if administrators could only manage users and access participant data within their organization. Also, it may not be desirable for certain types of administrators, such as Youth Development Coaches, to be able to access participant scores for all participants in the organization, since their job is to help specific individuals. This privilege might be better if it were reserved for higher up administrators in the organization, or those whose job is to analyze the effectiveness of the program.

Direction for future development

This project successfully transitioned the WRST to a digital tool. This will have a lasting impact on BSL by beginning their transition to a complete centralized digital platform. Over the course of the project, several possible additions were identified as potential places for future development.

Directions for future development of the WRST

Changing the language

One of the reasons that BSL wanted the tool digitized was to make the tool easier for non-native English speakers to understand the tool. This would allow for a greater range of individuals to be able to use the tool and allow BSL to work with demographics that they may have had trouble communicating with in the past. While this project improved in that area, there is still more which can be done. Adding the ability to translate to other languages, as well as adding more visuals and further simplifying the wording would help non-native English speakers understand the tool.

Initially, we had planned to add the option to translate the webpage. AWS Translate offers the ability to translate webpages, but only for certain geographical regions. Unfortunately, the Sydney server that the WRST is located on was not among these regions. This was discovered a few weeks before the end of the project, which was not enough time to implement a solution to the issue. However, a few potential solutions were identified: Google Cloud's translation service could be added, or translators could be hired to translate the site into another language. Also, if AWS Translate expands to the Sydney server, this could be used.

Using Google Cloud or AWS Translate would be

simple and easy. Either options allows for translation into hundreds of languages and requires a small amount of additional code. However, having a person translate the site results in a much higher quality translation, meaning users will better understand the site. Thus, it is better to have a translator translate the site if the tool only needs to be translated into a few languages. However, if the site needs to be translated into many different languages, AWS Translate or Google Cloud's translation service would be better.

Adding multiple data formats and visualizations

Another additional feature that could be added is multiple ways to format participant score data. This would involve gathering input from administrators on how difficult it is for them to process the data in its current format. Currently, administrators can download a CSV file of all assessments taken across all organizations. Each row in the file is an assessment, with score data as well as user information on the participant who completed it. However, assessments are ordered by the time they are added to the database, so multiple assessments for the same user are not grouped together. The administrator may need to manually sort the data in Excel before they can analyze it effectively. This requires extra time and labor from the administrator, which could have been spent focusing on the participant instead. Adding multiple data formats that the administrators can download would reduce the time spent ordering the data themselves and allow them to more easily analyze the effectiveness of their programs.

A more ambitious task would be to develop an interactive visualization of the data on the administrator section of the website. This would involve a substantial amount of coding, and would require research on different visualization types by reviewing existing literature and gathering input from administrators. A library that might be useful for this feature is Chart.js, which we used to create the graphs on the results and industry comparison pages of the website. Another popular visualization library is D3.js. It offers more features than Chart.js, but is larger and more difficult to learn to use. An interactive visualization of participant data, based on demographics such as age, that included graphs and other visuals, would help administrators be able to see trends in the data more easily.

Adding employer input

Another potential addition put forward by Diane Brown is an employer side of the tool. Since employers tend to not respond to surveys or other inquiries about skills needed, the CoP currently has a team which goes to various employers to develop a better understanding of what employers need and look for in employees. The team then takes this information and tries to match youth with these jobs. However, it would be much simpler if the data gathered could be continuously gathered and used to update the already existing employer skills comparison portion of the WRST.

The simplest way to do this would be to create a portion of the website where employers could fill out a form asking what skills they value. The form would ask what skill level they look for in an employee for each of the ten skills, with examples. It could also include a short section for the employer to say what skills they feel are necessary but not mentioned. The data from the first part could be automatically added to the industry results section of the tool. The second part would have to be analyzed by BSL staff, since any changes from this would mean altering the ten skills in the tool, and the ten skills in the tool were determined by extremely thorough research.

This method of gathering data is more convenient for both the employers and BSL because the employer can fill out the form when they have time, BSL does not have to send out a team to gather data, and data can be gathered continuously over time. This addition to the tool would allow the tool to be kept up to date with information from employers and would further

BSL's goal of integrating employer input into their programs.

Reformatting the assessment

One major change which could improve the tool would be to change the way that the assessment is structured, an idea which came from talking to the Youth Development Coaches. Instead of the user evaluating their skill on a scale of one to five, the user simply answers a series of yes or no questions. These would be questions such as "Can you send an email with an attachment?", or "Can you schedule a doctor's appointment on your own?". The participant would consider whether they can do what the question is asking and select the appropriate response. At the end of the assessment, the tool would calculate their level in each skill, based on their answers, and show the results on the same visuals that are currently used.

This version of the assessment would be simple to use, and the yes or no option forces the participant to self-reflect and leaves no gray area. Though this may seem opposed to advantage thinking, since it seems to divide the user's skill into the categories of able and unable, it is not. This is because it looks at the user's ability to complete several actions and uses that information to find the user's level of development in that skill.

However, this would require serious consideration into the differences between the skill levels, as well as actions which can be categorized into each skill level. This would be something which would have to be decided upon by BSL, since they define the skill levels. Thus, for a team to be able to change the assessment to this format, BSL would first have to decide on examples of what actions are representative of each skill level.

Implementing employee profiles

Another feature which could be added to the tool is profiles of workers in various industries. These profiles could be a video, interview transcript, or a profile page, similar to profile pages on social media

Jane Doe
Librarian at Queen Victoria Library

Diane Brown
Research and Service Development Manager, Youth Transitions Department at The Brotherhood of St Laurence

On a day-to-day basis, I keep up to date with current research and policy development, write reports, policy briefs, project plans etc., engage with internal and external stakeholders on specific projects and workshopping ideas, present to internal and external stakeholders (including government and policy makers) on projects and achievements for our department and supervise and manage staff. Some skills I have found to be particularly valuable are flexibility to changing circumstances, thinking creatively, excellent written and spoken communication skills, ability to conceptualize and analyze complex ideas, highly developed organizational and time management skills, strategic and critical thinking, digital literacy and good interpersonal skills. My favorite part of my job is engaging with new and exciting ideas to progress a social agenda and my least favorite part is managing competing priorities in a high pressure environment. If I could give my past self advice, I would say recognize your areas of strength—you don't have to be good at everything, no one is!

James Doe
Construction Worker at BigBuildings Inc.

Figure 26: Example layout for employee profiles.

sites. The people interviewed could talk about their career path, what they do on a daily basis, and tips and tricks that they have learned throughout their career. This would fit into BSL's plan of encouraging youth in their programs to be more independent and direct their own personal development. Once a participant uses the skills tool, they can view their results, which includes charts to compare their current skill levels with the skill levels desired for entry level positions in the top five employing industries. This helps youth understand what industries would best utilize their skill set, and may spark their interest in a certain one. The youth are then able to direct themselves to the industry page to learn more about that industry and specific professions within it. Including employee profiles on this section of the website would be an excellent way to give youth a vision of what their life could be like in certain professions. This would help them develop more clear career goals, and motivate them to develop their skills further to pursue these goals.

Given how useful employee profiles could be, we decided to create a template for what a profile page could look like (Figure 26). Though we did not have the time to add this to the tool, this work could be useful for future development of profiles.

Direction for future development of BSL's digital strategy

The Transition to Work team would benefit tremendously from a single centralized website that contains information on the TtW program for potential

participants, along with the ability to register users in the TtW program and hold their information including: addresses, emails, and phone numbers. Currently there is a disconnect between the program and potential new participants due to the lack of information available on the internet about the program. Youth and Youth Development Coaches alike shared these concerns about the lack of public information available on the program during focus groups. A website that helps better describe the program and its benefits would greatly influence more potential users to participate.

Information and data pertaining to an individual in the TtW program is often difficult to get and takes a substantial amount of time to retrieve, as described by the Youth Development Coaches. A centralized system that contains all of a user's information along with any other retrievable documents, such as cover letters and resumes, would decrease the time required for Youth Development Coaches to pull user information. A Youth Development Coach would then have more time to build meaning relationships with their clients.

Having a centralized system would allow for an even greater potential expansion of digital tools available for use by both participants and Youth Development Coaches. One idea is providing a form on the system for youth to fill out after applying for jobs to allow Youth Development Coaches to track their progress. The Youth Development Coaches explained to our team that they are often unaware of an individual's efforts when applying for jobs, and that knowing this information would improve their ability to help a participant in the job application process.

Conclusions

Impact of the digital WRST

The main deliverable of the project was a working digital prototype of the WRST. This tool will have an impact on BSL and their programs for youth by providing a central online location for data, increasing user friendliness, and allowing youth to compare their skill levels to the skill levels required by industries.

Digitizing the tool means that all the data is stored in a central location, which has two benefits: it helps BSL analyze the data, and it allows participants to access their results anywhere. BSL administrators will be able to access the scores of all participants who have taken the assessment without having to manually compile this data. They will therefore be able to evaluate the effectiveness of their programs more efficiently. This will then allow them to make improvements to the programs, which will in turn help youth be more prepared to join the workforce. Youth will also benefit from being able to access their results from anywhere, because it will allow them to reflect on and develop the skills they have not had the chance to develop at anytime they want, not just during their time at BSL.

The new version of the tool is much simpler and youth friendly. The wording of the assessment was changed and visuals were added to help youth better understand the questions and be able to rank their abilities more accurately. The digital platform also provides youth multiple ways to view their results, which makes it easier for youth to interpret their results and gain valuable insights. Understanding the assessment and their results allows the youth to take ownership over their development. If they do not understand what skills they should focus on developing, they cannot understand the benefit of the specific programs they are in and are thus simply following whatever the Youth Development Coaches tell them to do. However, if they understand what

skills they should develop, they can understand why the programs they are in are important, and can pursue development independently, which is essential for them to be able to continue to develop once they leave the program.

The digital tool also allows youth to compare their skill levels to those required in certain industries. This gives youth a direction to develop their skills and an end goal. This can help motivate them, since it is no longer the abstract idea that developing their skills will help them get some job, but the idea that they can develop their skills to get a specific job within a specific industry that interests them. Upon completion of the tool, the Youth Development Coach creates a plan for the youth based on their own goals and the results from the WRST. This ensures that the youth have a very personable experience and that the program is tailored to their own specific needs and desires. Essentially, it makes the process and end goal more concrete for the youth, by helping them develop a positive vision for their future.

Lastly, the WRST helps youth develop a positive outlook on their future by incorporating advantaged thinking. Advantaged thinking is the idea that all people have equal potential to develop skills, but not all people have been given the same opportunity to develop those skills. In this framework, the WRST operates as a way to see what skill level the user has developed thus far in their life. This is different from other assessments because the WRST results do not define the user, but simply where the user is at a certain point. This is an important distinction, because if the results defined the user, it would imply that the user does not have the same potential as someone with higher scores and that there is no room for growth. However, by viewing the results as the current skill level, it implies that there is room for the user to grow and that they have untapped potential. This is critical for helping people develop and avoiding a mindset that some people have more potential than others.

This project will directly impact BSL and the youth in their programs in the ways discussed above,

but from a broader perspective, this project will help combat youth unemployment in Australia. One of the main factors of the high youth unemployment rate is the skills gap. This project helps to address the skills gap by giving youth a way to assess their own skills and compare themselves to industries to see where their skill set aligns best. Although the tool does not develop the skills of the youth, it shows the youth what skills to improve upon. This is needed in Australia, since there is not a lack of training, but a lack of relevant, targeted training. By better targeting the training, youth can find jobs that align with their skill set, thus increasing retention rate at a specific job and decreasing youth unemployment. By creating this tool to help combat youth unemployment, we are creating a better future for Australian youth. We are lowering the number of youth who suffer from health issues and involvement in crime due to the reality of unemployment. We are also aiding in creating a brighter financial future for Australian youth by getting them into a stable job and decreasing their chance of low lifetime earnings.

Assessing our approach

Looking back on the approach we took over the past seven weeks, we have identified what worked well, what did not work well, what we would do differently, and limitations of the project.

Our methods involving potential users worked extremely well. Our focus groups and user testing provided us with useful insight on potential changes to the tool and possible future implementations. Julia Baron and Alex Findlay of BSL helped our team incredibly by organizing these focus groups and user tests for us. Our method of conducting a literature review for the skills required by the top five employing industries also produced the results we had initially set out to achieve. Our team collaborated very well together throughout the term. We naturally took roles in which our expertise lay. There were no interpersonal issues within our team which was great

as we were able to devote all of our energy to the project.

Initially, our team was going to conduct interviews to determine the skill levels required for each industry. Our team later decided that this would require too much time to gather this information for a large amount of industries. Instead, we determined that a survey consisting of a ranking system of the ten skills would be best suited to the task for mass data collection. Unfortunately, only one employer out of the fifty we contacted had responded after two weeks. Employers are extremely busy throughout their day, and filling out surveys is not an appealing use of their time. The skill aspect of the tool was incredibly vital to the project, so we had to change our method once again.

Despite the successful completion of the project, there are a few limitations to our work. First, while our project resulted in a functional digital prototype of the WRST, it is not ready to be utilized in TtW or other BSL programs without first being assessed by a professional developer to ensure that it is secure and performant. Second, while the WRST will be useful for BSL, it is a stand alone tool. BSL would benefit from digitizing other aspects of their programs and incorporating new features, such as the employee profiles discussed in future directions. Lastly, the tool is meant to help youth understand skills they should develop in order to succeed in the workforce, but it does not actually help them develop these skills. The tool must be used in conjunction with other activities in order to successfully help youth develop their skills and address the skills gap. Future development could explore ways to improve the digital WRST and overcome these limitations.

The only part of this project that our team would have done differently from the beginning would be to start with a literature review to determine the skills needed for each industry. We used some time at the beginning of our project by trying methods such as interviews and surveys, but if we had initially started with a literature review, we would have been able to

further analyze the skills needed.

Lessons learned

Over the course of this project, we learned several valuable lessons which will help us throughout our lives. The first lesson was how to work independently. Most of our work was done out of a local library with no BSL staff around. Consequently, we made sure to reach out for assistance as soon as the need arose, since we knew it would take some time to get a response. Also, we made sure that we were always on task so that we did not fall behind. The second lesson was how to be flexible. Our method for the first objective changed three times within the first week, and other plans were constantly shifting. To best deal with this, we had to be flexible and move our focus to the better plan as soon as we could. Lastly, we learned how much background knowledge is needed to formulate an effective solution. We spent seven weeks researching background information before we started the project, which allowed us to understand the whole context, and showed us why non-technical aspects, such as the incorporation of advantaged thinking, were so important to the project.

Acknowledgments

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Supplemental materials (Appendices) for this project (raw data, research instruments, additional project references, and outcomes) can be found at http://wp.wpi.edu/Melbourne/, using key words from the project title.