MARINE PEOPLE PARTNERSHIP

STUDENT INTENTIONS AND PERCEPTIONS SURVEY | NEW BRUNSWICK

REPORT OF FINDINGS, ANALYSIS AND RECOMMENDATIONS

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Institute for Ocean Research Enterprise (IORE)
and the Marine People Partnership

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The Marine People Partnership (MPP)

The Marine People Partnership (MPP) was formed with support from Irving Shipbuilding as part of their value proposition commitment to strengthen the Canadian marine industry under the National Shipbuilding Strategy. MPP has a national mandate to explore and address workforce development issues and to help develop and establish an innovative, sustainable and globally competitive marine industry. Through myriad studies, programs and initiatives, MPP works with a wide range of partners and organizations to help ensure that their work is relevant.

Dr. Sherry Scully and Anna Naylor's research and work activities are supported by this funding program.

Institute *for* OCEAN RESEARCH *Enterprise*

INSTITUTE FOR OCEAN RESEARCH ENTERPRISE (IORE)

Institute for Ocean Research Enterprise (IORE) is growing the ocean economy through research. Established in 2011 as a Canadian not-for-profit corporation, IORE partners with industry, academia, and government agencies to inspire and facilitate world-class scientific research, and to apply and commercialize its results. Whether we're leading the charge, or supporting the efforts of collaborators, IORE's purpose remains the same: we're growing the ocean economy through research addressing the economic, social, technological, environmental, and policy challenges that exist for regional coast waters, and Canadian and international oceans.

For more information, please visit IORE.ca.

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Executive Summary

In May of 2018, in partnership with the New Brunswick Department of Education and Early Childhood Development (EECD -NB), a study was initiated involving students in grades 6-9 across the province of New Brunswick. The Student Intentions and Perceptions survey was launched across English schools in the eastern and western districts[1], and received 3279 responses.

Understanding the perceptions of marine-related and trades/technology careers among today's youth and understanding their intentions and influences will provide useful insights to inform recommendations for the design of future awareness/exposure building initiatives and career development programs to help us shift the dial on the workforce challenge that is presently being experienced across the marine industry.

It was hoped that surveying younger students (grades 6-9) would provide useful insights into understanding when and how their career perceptions are formed, which could signal optimal periods for targeting career counseling and awareness and exposure building programs.

The survey tool was comprised of 24 key questions that solicited responses to key constructs relating to awareness, intention, perceptions, and attitudes regarding careers in the region generally, and careers relating to the marine industry and skilled trades and technology roles specifically.   The survey data provided insights into;

- the perceptions young people have of alternative education and career pathways
- how and when those perceptions are formed, and who has strongest influence over them
- young people's career and mobility intentions
- young people's perceptions of minimum requirements for jobs and education

This report provides a detailed analysis of the data, as well as a summary of insights and recommendations for career literacy interventions and programs aimed at the grade 6-9 cohort. Among the key findings of this study are;

- 32% of students responded that they intend to stay in New Brunswick, while 36% intended to leave, and 32% did not know. If we combine those with the intention to leave, with even a fraction of those who weren't sure, we could potentially be facing the loss of a significant proportion of the region's youth – or at the very least, the disengagement of those youth from regional pathway exploration activities.
- The data suggests that the intention to leave is partially driven by lack of optimism in the ability to partake in the great jobs that are available regionally, as well as due to a pull to other regions (i.e. the allure of mobility itself) to explore and gain independence.

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[1] Other schools regions chose to not participate in this study at this time due to concerns that their school communities had been over-surveyed during the past school year.

- The question of mobility was addressed a second time towards the end of the survey to evaluate consistency of response. Both intention to leave and intention to stay in New Brunswick decreased, while uncertainty increased significantly. This indicates that the survey itself provoked students to think more critically about their future options. It also demonstrated the malleability of youths' attitudes and intentions when they are given an opportunity to consider new information, ideas, and pathway. This in turn illustrates the potential positive influence of career literacy initiatives to broaden young people's exploration of career options.

- Responses demonstrated that students form strong early bias against certain education and career pathways, and a correspondingly strong bias towards a socially-endorsed academic pathway – even without a specific career/credential outcome in mind. This means that young people are narrowing down their options and disregarding those that don't align with their perceptions of valid, endorsed (by parents and peers) options.

- A significant proportion of particpants expressed fear (10%), lack of interest (47%), or outright disdain (21%) for ocean-related careers. Only 13% of respondents indicated that they would consider a marine-oriented career. Addressing these negative perceptions of oceans and marine careers needs to be a priority for the province to engage youth in an evolving and booming industry at their doorstep. This suggests a need for more experiential learning opportunities, in and out of school, that expose youth to oceans in safe, engaging, and adventurous way. There is an immediate need to replace fear of the oceans with curiosity, and reluctance of getting wet and dirty with the thrill of exploration and discovery.

- Only ~4% of New Brunswick youth expressed an interest in pursuing an entrepreneurial pathway. This number was equally represented by male and female participants.

- Interestingly, of the ~4% of students who did indicate an interest in entrepreneurship, only 5% of those expressed an interest in opening a business that was skilled trades-related. This suggests that, while students have some awareness of this option, entrepreneurship is not the pull that draws students along a skilled trades career pathway

- It is important to recognize the value of both an informed yes and an informed no. A key outcome of any awareness and exposure program is to support students in making an informed decision about whether or not to pursue a particular pathway. Without some awareness, students are too often dismissing some career options without consideration, or defaulting to others, with similarly little information.

Prior to conducting this study, is was anticipated that perceptions and attitudes of youth across the Atlantic region would be the same or very similar for all constructs being evaluated. However, this study demonstrated that despite regional proximity, the attitudes of youth in New Brunswick varied in a few significant ways from those of their peers in Nova Scotia. Some key areas where significant differences were found were;

- New Brunswick youth expressed a significantly higher intention to leave the province following high-school (36% vs 31%), and significantly lower intention to remain in the province (32% vs 42%).

- In response to a question asking youth about their intentions following high school, the intention to pursue a University pathway were nearly equal for youth from the two regions, however youth from New Brunswick were significantly less likely to indicate an intention to pursue a Community College education pathway (i.e. 10% for NB youth vs 16% for NS youth). This suggests that more work needs to be done to validate and endorse alternative education pathways in this region.

- A question asking youth what they thought was the best source of information about future goals and careers prompted responses that varied significantly from their Nova Scotia peers. New Brunswick youth identified 'parents and other family members' as their top go-to for career information (67%, vs 19% for NS youth), while NS youth had identified friends as their sources of career coaching (46% NS vs 37% for NB youth). Perhaps even more significant was the perceived role that teachers and principals can play in career coaching (23% for NB youth vs 1% for NS youth), and the importance of career days at school (26% for NB youth vs 2% for NS youth). This suggests that traditional sources of career coaching continue to play a relevant and impactful role in New Brunswick. Conversely, new and digital sources of career information were equally important to youth from both regions (social media 23%).

- New Brunswick youth demonstrated a lower awareness of marine-oriented careers across the board, for example, when asked to identify careers they had heard of 65% of NB youth had heard of careers in the Navy (vs 87% or NS youth), 41% had heard of shipbuilding (vs 64% for NS), 57% had heard of commercial fishing (vs 75%) and only 47% had heard of careers as an ocean scientist (vs 63% for NS). These results demonstrate a distinct opportunity to elevate awareness of the myriad and varied marine-oriented career opportunities available across the region.

- Students in both provinces expressed the same level of interest in considering a marine-oriented career (13% yes), however New Brunswick youth were much more likely to provide a negative (no) response to this question (62% vs 50% for NS youth) indicating that they were less open to even considering this option.

- When provided an opportunity through open-text to elaborate on why they were not interested in marine-oriented careers, New Brunswick youth were more likely to cite lack of interest (47% vs 37% for NS youth), while Nova Scotia youth were more likely to provide a disparaging reason (29% for NS youth vs 21% for NB youth).

- New Brunswick youth were less likely to know someone who works in a skilled trade (55% yes for NB vs 69% for NS). This lack of awareness or familiarity may have been linked to more NB youth also expressing no interest in pursuing a career in the skilled trades (42% no for NB youth vs 31% for NS youth). New Brunswick youth also provided more disparaging comments (11% vs 5% for NS youth) as reasons for their lack of interest in this career pathway.

- Correspondingly, New Brunswick youth expressed some less positive perceptions of skilled trades roles. In particular, NB youth were less likely to identify these jobs as interesting (51% vs 62% for NS youth) or important (75% vs 82% for NS youth).

- New Brunswick youth were less likely to communicate optimism in the availability of good jobs in their region (70% true vs 78% true for NS youth).

This report provides evidence-based observations and recommendations for future career literacy programs and engagement initiatives. While the data captured in this report are interesting and informative in their own right, this study will also serve as a benchmark to evaluate the impact of awareness efforts going forward.

Introduction

In light of insights gained from a national study examining workforce development in the greater marine industry[2], it was imperative that we look deeper into the issues of career literacy among youth, as an essential but long-term link in the human capital equation. The location of IORE within Nova Scotia made the Atlantic region ideal for additional studies of Student Intentions and Perceptions to provide rich regional data on the perceptions, beliefs and attitudes of youth in Atlantic Canada with regards to careers within their province generally, and careers related to the marine industry in particular.

Atlantic Canada is witnessing several emerging and accelerating sectors across the marine industry, including shipbuilding, boat building, ocean technology, tidal energy, and fishing and aquaculture. Growth in these sectors are paralleled by demand for workers in skilled trades & technology roles, and in oceans-oriented professions and applied sciences to sustain the activity and growth of these sectors. This study provides some insights into the enthusiasm New Brunswick youth have for these regional careers.   Anecdotally, we have seen that interest and intention for careers in skilled trades and technology, as well as careers in the marine industry remain hampered by persistent bias, lack of awareness, and misinformation[3], which in turn produces a recruitment challenge to employers and post-secondary education programs. This study is an attempt to gain further insight into these challenges.

Encouraging youth in Atlantic Canada to consider careers across the broad marine industry has a second key objective that is related to the economic and employment benefits of emerging sectors. The region can also benefit from stemming the out-migration trends that have characterized its history and present. The breadth and scope of marine-oriented careers across the region and across the sectors offers varied options to young people to pursue their dreams while remaining in the province.

Improving young peoples' awareness and understanding of local career opportunities is an important ingredient in meeting these objectives for strengthening the regional economy. Understanding youth perceptions of marine-related careers, and understanding their intentions, drivers, and influences, will provide useful insights to inform recommendations for the design of future awareness-building initiatives aimed at alleviating the regional workforce challenge.

Impetus for the Study

The Marine People Partnership (MPP) is an initiative arising from the value proposition for the National Shipbuilding Strategy (NSS). This initiative has completed 4 years of a 5-year project plan. In

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[2] Scully, Sherry. (October 2015). The Marine People Partnership: The challenges, needs and opportunities for strategic workforce development in the greater marine industry. The Institute for Ocean Research Enterprise (IORE)

[3] Fenwick, 2006; Minister's Panel on Education, 2014; Tyler, 2013; Guest, Lotze, and Wallace, 2015; Scully, 2015

the first phase of the project, MPP presented a report to Industry Canada (Scully, 2015), outlining the challenges, needs and opportunities for strategic workforce development in the greater marine industry. This report identified several key priority areas that have particular relevance to workforce issues in Atlantic Canada. These include;

- Reversing the bias and stigma of the marine industry in particular, and of trades and technology roles in general
- Addressing gaps in learning and coaching in the mindset and skills of entrepreneurism
- The need for career literacy programs for young people and their parents
- Opportunities to develop additional exposure and awareness building programs with broader reach and focus
- Understanding the drivers and motivators of inter-provincial mobility that draw youth away from our region
- Understanding how perceptions are shaped by regional career opportunities and media coverage, and how this influences student intentions early in their education and career pathways

Understanding the perceptions of marine-related careers among today's youth, and understanding their intentions and influences, will provide useful insights to inform recommendations for the design of future awareness/exposure building initiatives to help us shift the dial on this workforce challenge.

Benchmarking the Current Study

The survey study was modeled on a previous 2006 High School Graduate Intentions Survey[4], which examined the post-secondary intentions of grade 12 students in Nova Scotia. The study captured young people's intention to pursue post-secondary education (college and University), or to enter into employment immediately, and it captured students' perceptions of key influencers (i.e., parents) in their post-graduation intentions. This current study has been expanded to capture data relating to student perceptions & intentions, motivation, and influence relating to careers within the marine industry specifically, and the broader STEM category generally. The current survey has also been modified to accommodate a younger and broader sample group (i.e., grades 6-9) as it was felt that there would be greater utility in understanding the perceptions and intentions of younger students so that interventions can be planned, through education, awareness and exposure programs, to inform those perceptions before youth commit to an education or career pathway.

This study also evaluates constructs relating to career literacy and career maturity, which refer to an individual's awareness of the myriad career options available to them, coupled with the ability to make informed, appropriate career choices. There is very little current extant literature on these constructs. The most relevant literature examined young peoples' awareness of what is required to make a career decision and the degree to which one's choices are both consistent and realistic over

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[4] Nova Scotia Department of Education, December 2006.

time[5]. A related recent study[6] of career education modules presented in elementary schools in Alberta did find that students who participated in integrated career education reported that it had helped them to learn more about themselves and about careers. More importantly, students reported a heightened interest in learning more about careers and about the broad possibilities for their futures. "*If students can imagine their futures and become excited about these possibilities, then they may feel more connected to their education, see the relevance of their education, and be more interested in learning how they can attain their future life and career goals.*" (pp. 18-19)

Ocean Literacy, or age-appropriate knowledge of the ocean's science and commercial qualities, and awareness of ocean-related careers and jobs, is a key construct being examined in this study. There is very limited extant literature on this construct; however, one recent study[7] did examine ocean literacy levels of Nova Scotia students and reported low levels of awareness and understanding. This report will provide some data for comparison.

This research study also examines student intentions towards STEM-related careers. A recent study by WISEatlantic[8] revealed that students have relatively poor awareness of the math and science requirements for STEM careers (or of the variety of STEM careers available to them). The analysis by Franz-Odendaal et al focused primarily on the career awareness and intentions of female students in Nova Scotia but provides a point of comparison for this broader study.

The proposed research will also examine key influencers for young people. Industry reports have examined the influence of guidance counsellors[9] and parents[10], and have shown that the career and education advice of career counsellors tends to be limited to traditional academic programs and options that may be more a reflection of the counsellors' preferences than the students'[11]. This finding was repeated in the report by Freeman, who noted, '*teachers and guidance counsellors have a bias toward University as the anticipated outcome of high school*', which in turn attaches a stigma to other options that young people might want to pursue. This report also showed the influence of parents and proximal role models to inform the career choices of children through how they assign social value to choices, provide encouragement[12] or how they reinforce feelings of efficacy for a proposed choice[13]. These studies demonstrate how the messaging of valid or 'good' options communicated to children implicitly and explicitly throughout their lives. The current study also

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[5] Crites, 1978; King, 1989; Ohler, Levinson, & Hays, 1996

[6] Welde, Bernes, Gunn, & Ross, 2016

[7] Guest, Lotze, & Wallace. *Youth and the sea: Ocean literacy in Nova Scotia, Canada*, 2015.

[8] Franz-Odendaal & Blotnicky, *Career choices and influencers in science, technology, engineering and math: An analysis of the Maritime provinces*, January 2014.

[9] Freeman, Myra. Ministers Panel on Education. *Disrupting the status quo: Nova Scotians Deman a Better Future for Every Student,* October 2014.

[10] Nova Scotia Department of Education. *2008 Follow-up Survey of 2006 Nova Scotia High School Graduates,* 2010.

[11] Scully, October 2015

[12] Leung, Wright, & Foster. *Perceived parental influence and adolescent post-secondary career plans.* High School Journal, 70, 1987.

[13] Bandura, Albert; Barbaranelli, Claudio; Caprara, Gian Vittoria; Pastorelli, Conchetta. *Self-efficacy beliefs as shapers of children's aspirations and career trajectories*. Child Development, 72(1), 2001.

focuses on how and at what age these messages of validity (and stigma) begin to form and inform thoughts about children's futures.

Objectives of the Study

Understanding the perceptions of marine-related careers among today's youth and understanding their intentions and influences will provide useful insights to inform recommendations for the design of future awareness/exposure building initiatives to help us shift the dial on this workforce challenge.

The data generated by this study will help to inform;

- Career literacy programs and coaching
- Career literacy programs relating specifically to interprovincial mobility
- Awareness and exposure building programs in grades 6-9
- Discussions and decisions regarding dual-credit and co-op programs in P-12
- Decisions regarding a common digital career literacy platform
- Preferred channels for accessing youth with career coaching
- Involvement of proximal role models in awareness and exposure programs
- Recruitment and retention strategies for post-secondary institutions (PSIs), apprenticeship programs, and employers (entry level) in Atlantic Canada
- Marketing and social messaging strategies to influence youth perceptions of career opportunities in New Brunswick
- Curriculum links with career opportunities (and skill relevance)

And will provide insights into;

- the perceptions young people have of non-traditional education and career pathways
- how and when those perceptions are formed,
- who has influence over this decision making
- young people's career and mobility intentions
- and, young people's perceptions of minimum requirements for careers and education

The data emerging from this survey could provide valuable insights into social perceptions of careers in trades & technology, engineering, ocean sciences and marine careers, and of factors that strongly influence the socialization and normalization of those perceptions. Surveying younger students (grades 6-9) may provide useful insights into understanding when and how those perceptions are formed and may signal optimal periods for targeting career counseling and awareness and exposure building programs.

Data Collection

Survey Design

This study was conducted using an online survey comprising 24 core questions (2 demographics, 22 construct-related). The survey used a variety of question styles, including single response, multiple response, true/false, and open-text response. The survey was designed to assess several constructs relating to career intentions and perceptions for careers in the marine industry, including skilled trades, marine-oriented careers, entrepreneurship, and knowledge worker roles (i.e. engineering and architecture).

Pilot Study

During the original study, conducted in Nova Scotia in 2016, the survey was piloted on Tuesday, January 19th with a grade 6 class from a school in the Straight Regional School Board. Students independently completed the online survey in a classroom with 4 observers who answered questions as they arose and made note of common questions and areas of difficulty. The objective of the pilot study was to evaluate;

- *readability* of the survey (i.e. could students understand what is being asked, are the questions accessible to the broad reading abilities of the sample group),

- *reliability* (are any questions ambiguous, do students interpret questions the same way, do the observers interpret responses similarly),

- *validity* (do the questions solicit the desired responses, do the questions tap into the target constructs),

- *time for completion* (what is the range for completion, what is the average completion time)

The pilot included 26 students who reflected a diverse cross-section of youth in Nova Scotia (i.e. African Nova Scotians, First Nations, students from rural and urban communities, immigrant students). The first students to complete the survey did so at the 10-minute mark, most students were completed within 20 mins (all but 3), and all students completed within 25 minutes. This information informed the instructions to teachers that were distributed along with the survey link when the survey was launched.

Observers found consistency in the interpretation of questions and in the types of responses that emerged. Very minor adjustments were made to the survey (i.e. Nearly the entire class asked '*why does it say 'other*'' in the gender question, and thus it was decided to omit this third option as it posed an initial distraction as students settled into the survey). The final open-text question asked students to identify

the job they would like to do when older. Several students were unsure of specific job titles and chose instead to write descriptive narratives of their future desired role. This open text response box was extended to allow for more room for these descriptive responses.

The pilot data was kept, but was not amalgamated into the final survey data, and is not included in the New Brunswick data.

Survey Tool Modifications

Due to the smaller sample group involved in the New Brunswick study, it was decided that the questions asking students to identify School Board and School name be omitted, to preserve anonymity. The survey was modified broadly to included references to New Brunswick instead of Nova Scotia.

Questions 9, 10, and 11 asked students *When I think about my future jobs, what is most important to me (my parents/my friends) is to…* This question was modified to include four additional responses that showed highest frequency in the open-text responses from the original study. These additional response options were; *Continue my education (College or University or Apprenticeship); Have a job that I enjoy; Have a good work/life balance; and Help other People*. The multiple-response option was modified to allow for only 3 responses, and the open-text option was removed, to support data analysis and help identify preferences and rankings. In the previous study many students selected all responses rather than selecting only the most important.

Sample Group

This study sampled students in grades 6-9 across the province of New Brunswick. 3279 students responded to the survey which was conducted in English. Given the regions that participated, it is expected that this sample includes a mix of rural and urban students. Two key regions (North and South) decided to not participate in the survey, as it was felt that their schools had been over-surveyed during this school year. It is important to note that the North and South regions are the coastal regions where students would have most exposure to ocean-related careers and personal ocean access.

Statistic validity required a minimum sample size of 3,257 students, with proportionate representation from the two participating regions, and across grade level. The desired sample size was calculated using an estimate of the number of grade 6-9 students across NB from participating regions (~15,000), with a margin of error set at 2%, and confidence level of 99%. By the conclusion of the two-week survey period, we had exceeded this minimum sample size and closed the survey link and the data collection period.

Methodology

The study was launched through the NB Department of Education and Early Childhood Education (EECD), with the support of district Technology Coordinators from each region, on Wednesday, May 16th, 2018, and closed on Monday, June 4th, 2018 at 4:30pm. Students were provided the link to the survey by the teacher, were given brief instructions for completion (see Appendix A) and completed the survey during class time. The timestamp accompanying each submission indicated that no surveys were conducted outside of school hours, implying that none were conducted without the support and instructions from the administering teacher. Survey responses were managed by the Principal Investigator through a database hosted by Survey Monkey. Upon completion of the survey period, the data were transferred to an Excel spreadsheet. At this point the data was only handled by the principal investigator and the research assistant. All working data was stored on the secure laptops of these two investigators. The data on Survey Monkey will be deleted upon presentation of this report to NB EECD.
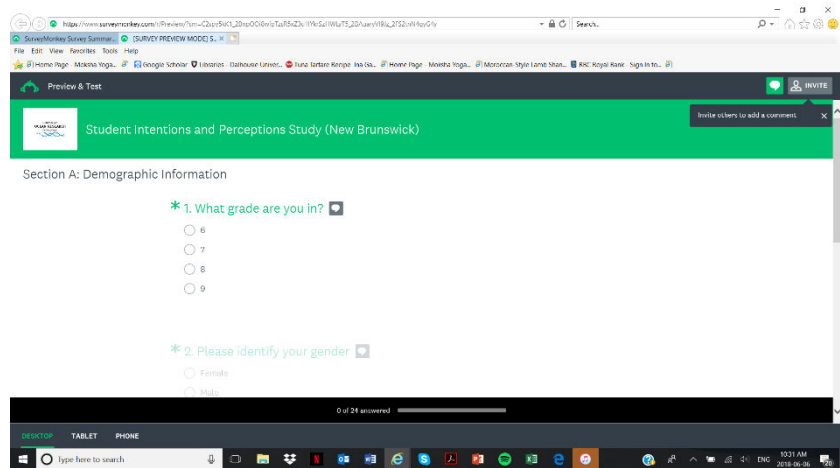
A primary analysis was then conducted that provided a summary and overview of each question in isolation. This was followed by a detailed analysis that examined predictive qualities and correlations between the variables. It was agreed with the EECD that analysis and reporting would occur only with the amalgamated data, and not by region. School names were not requested as it was expected that some schools could have so few participants that anonymity could not be guaranteed with more granular reporting.

Data Analysis

The data was coded by the research assistant and the principal investigator and was separately and simultaneously or consecutively analyzed by the two investigators to evaluate variance/consistency in findings (validity). A thematic analysis (for open-text responses) was conducted in Excel.

Open-text responses were analysed by pulling a random sample of 500 from the full sample group (a different random sample was pulled for each open-text response group). Responses were analysed for

common themes and coded according to those themes. Generally, the top 5 (frequency) responses were reported, although other less-common responses were also examined if their low-response rates were noteworthy.

Validity of codes was established in two ways; by having the lead researcher and the research assistant code the same sets of responses independently and comparing the results, and by pulling a second smaller random sample of responses (100) and applying the same codes to see if they fit most of the responses, and to determine if roughly the same distribution of codes occurred. The results from these tests of validity showed 96% accuracy in coding between researchers, with a 2% tolerance, and unremarkable differences in distribution of codes between the first random sample (of 500) and the second (of 100).

Demographic Data

3,279 students in grades 6-9 participated in the survey

The sample group reflected the population well, with representative participation by grade and gender, but was limited to English schools within just two districts

Personal, potentially identifying demographic data was not solicited (i.e. race, religion, family structure)

Demographic data is reported at the amalgamated level only (i.e. not at the Board or school level)

Sample Group Demographic Data
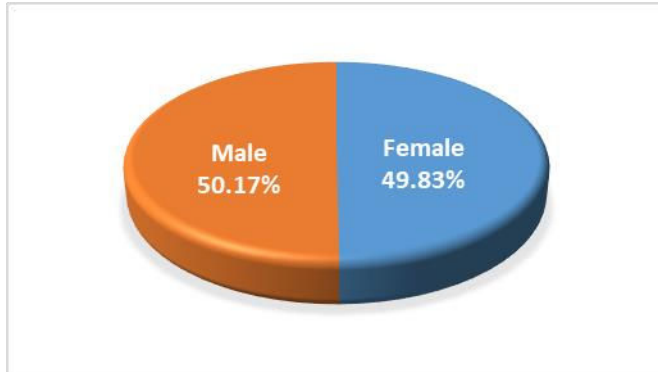
Gender

An equal number of males and females participated in the study.
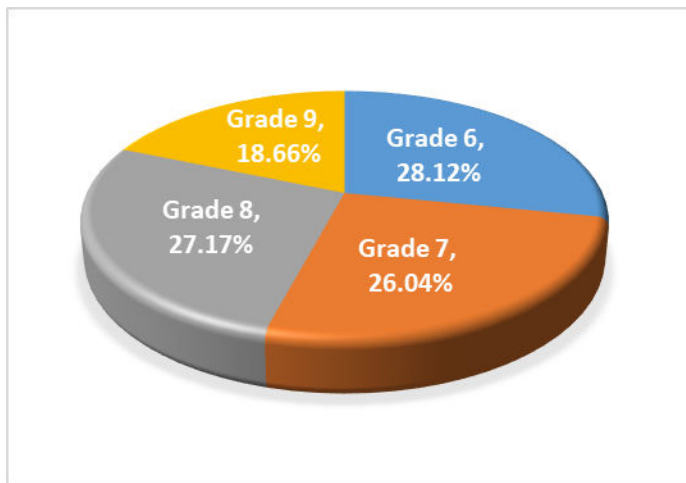
Grade

All four grades were well represented. It is important to note that grades 9s were proportionately less-represented. This is important to note when considering grade related correlations within the data. There can appear to be a significant difference in grade 9 responses that can be explained by the smaller group sample size.

Influence on Pathway Intention

Did any of your parents or guardians go to College or University or do they go now?

Research has shown that parents are powerful influencers in young peoples attiudes, biases, and choices about their future[14].   Research has also shown that parental participation in postsecondary education is a powerful predictor of student pursuit of the same[15].

82% (yes and no) of students showed an awareness of their own parents' education pathwway, and this response rate did not vary significantly with gender or grade. Awareness is a strong predictor of career maturity[16], and 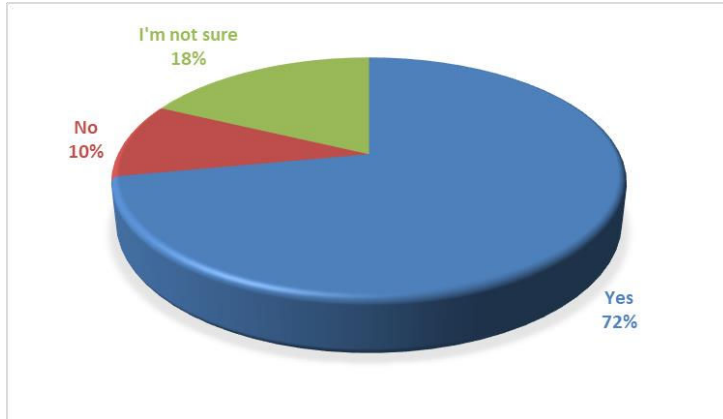indicates some level of discussion in the home about education pathways and options. This data will be analyzed to determine it's influence on youth education and career intentions, and on perceptions of career options and opportuntiites.

The accuracy of the youths' awareness of parents education does come into question, as the 'yes' responses are significantly out of proportion with the ~46% reported by adults ages 25-64 in the National Household Survey 2011[17]. This might be explained by participation without completion in post-secondary education, or may reflect youth's idealistic views of their parents (i.e. where they lack confirmation, they assume their parents have completed some form of post-secondary education). This in turn demonstrates that perceptions of parents education levels is not a perfect proxy for true awareness, or for the assumption that the perceptions are informed by career/education discussions at home.

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[14] Bandura, Barbaranelli, Caprara, & Pastorelli, 2001; Bergen, 2006; Dietrich, 2013; Leung, Wright, & Foster, 1987; Young, Friesen, & Borycki, 1994

[15] Hango & de Brouker, 2007

[16] Carpenter, 1993; Welde, Bernes, Gunn, & Ross, 2016; Zimmer-Gembeck & Mortimer, 2006

[17] http://www12.statcan.gc.ca/nhs-enm/2011/dp-pd/prof/details/Page.cfm?Lang=E&Geo1=PR&Code1=12&Data=Count&SearchText=Nova%20Scotia&SearchType=Begins&SearchPR=01&A1=All&B1=All&GeoLevel=PR&GeoCode=12

Data Analysis

Students form biases against particular career and education paths by grade 6

NB youth cite their parents/family as the best sources of information and guidance in making career and education choices

More than a third of New Brunswick youth expressed an intention to leave the region following high school

There is strong optimism among NB youth in regional career prospects – both rural and urban

The majority of regional youth are not interested in careers in the marine industry or skilled trades

Post-Secondary Pathway Intentions

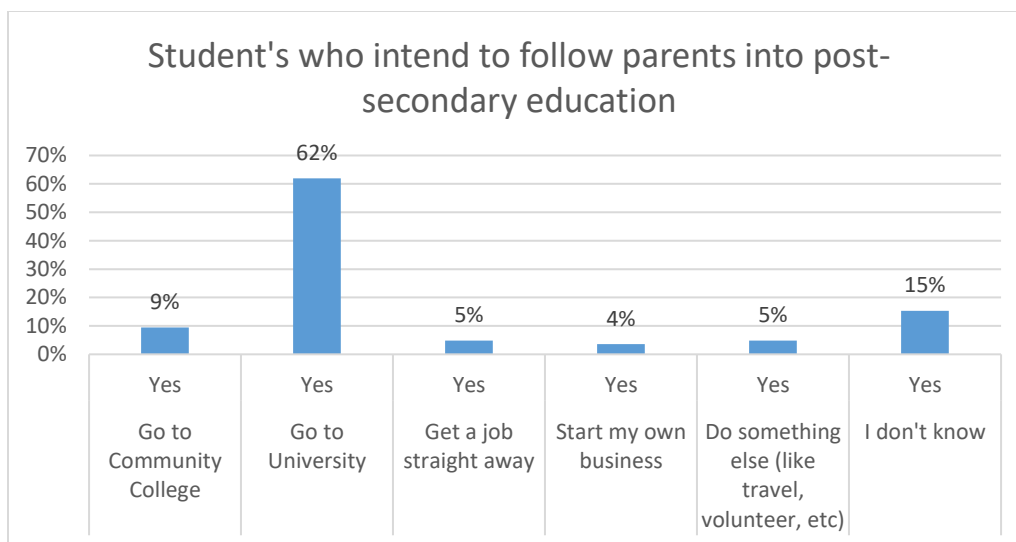### After I finish high school I would like to; (pathway)
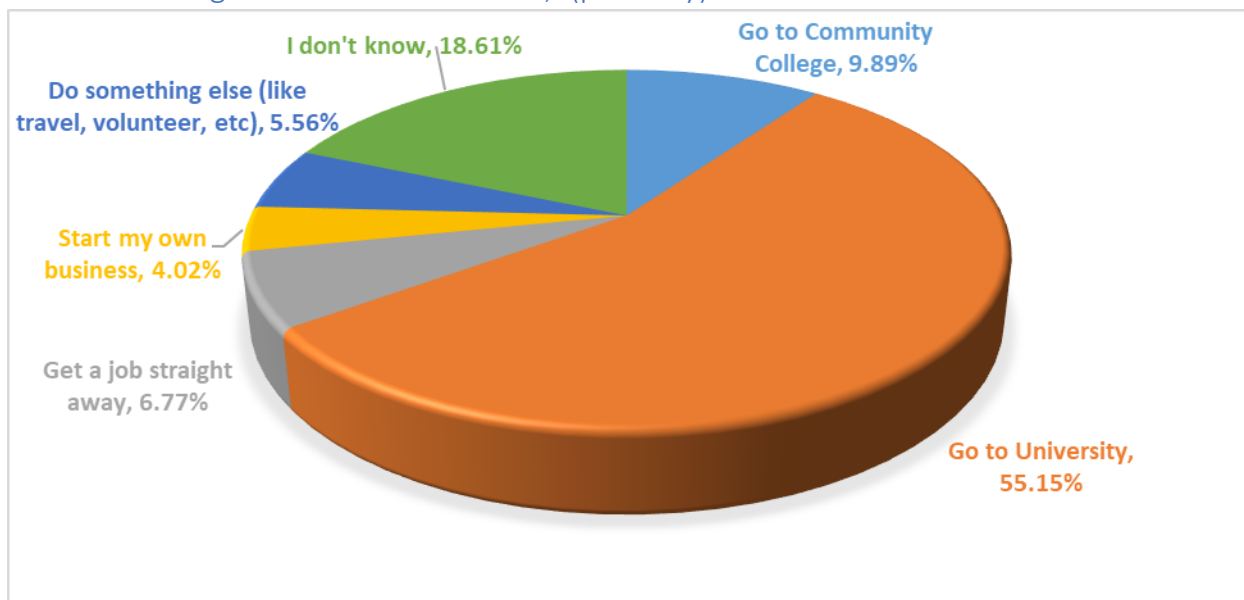
Roughly 65% of students reported an interest in continuing with post-secondary education immediately following high-school. This is considerably higher than the present rate of tertiary attainment of 53% (among adults aged 25-64), according to the 2015 OECD report[18], which shows a trend towards (expectations for) post-secondary education, or increased optimism among young people in their abilities to participate and persist in the tertiary system. Persistence in post-secondary, as reported by OECD do indicate that roughly 20% of combined first-year students in college/University do not remain in their programs beyond first year[19], and thus the significant gap between actual attainment and expected attainment my be explained by persistence challenges. This study does show a strong preference for a University pathway over a Community College pathway which suggests that awareness or prestige perceptions are already well-embedded by the middle-school years.

Higher reported intention may also reflect a growing preference for post-secondary education arising from the coaching and expectation-setting by parents. OECD found that 73% of students with higher education have a parent with higher education. Parental educational status was found to be a predictor of post-secondary intention in this survey as well. The illustration below shows that among students who indicated that their parent/parents/guardian had gone or were presently attending a College or Universtiy, 71% also expressed this intention.

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[18] Education at a glance 2015. (November 24, 2015). OECD Indicators.

[19] Andrew Parkin and Noel Baldwin. Persistence in Post-Secondary Education in Canada: The Latest Research. http://www.yorku.ca/pathways/literature/Aspirations/090212_Persistence_EN.pdf

Student's who intend to follow parents into post-secondary education

|	Yes Go to Community College	Yes Go to University	Yes Get a job straight away	Yes Start my own business	Yes Do something else (like travel, volunteer, etc)	Yes I don't know
%	9%	62%	5%	4%	5%	15%

Roughly 35% of the students surveyed indicated that their educational pathway would likely end (or weren't sure) following high school, which is higher than OECD findings[20]. These students selected other options that included; get a job (6.8%), start a business (4%), and do something else (5.6%).   An additional 18.6% of participants expressed that they weren't sure what pathway they would follow. It may be that this group of students hasn't considered life beyond public school yet (i.e. during the pilot session, several students commented that they had never discussed their future with anyone yet, and hadn't given it much thought). This demonstrates the opportunity to get young people thinking broadly about their pathways early in their educational careers, as research has shown that students who establish clear career goals are more likely to persist in their pursuit of tertiary education[21]. Early exposure to a broad range of career types provides greater opportunity for youth to establish a goal, and in turn, engage in both their education and, later, their work lives.

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[20] OECD 2012. Grade Expectations: How Marks and Education Policies Shape Students' Ambitions, PISA OECD Publishing. PISA IN FOCUS. 2012/12 (December)
[21] Berger, Motte, & Junor, 2007

By gender;

Females were significantly more likely to report planning to attend University, and slightly less likely to report planning to attend community college, or to be uncertain about their next steps. These gender differences are consistent with women's current (higher) rates of university participation[22]. Males and females were equal in their intention to pursue an entrpreneurial pathway (2%). There were no siginficant response differences by grade.


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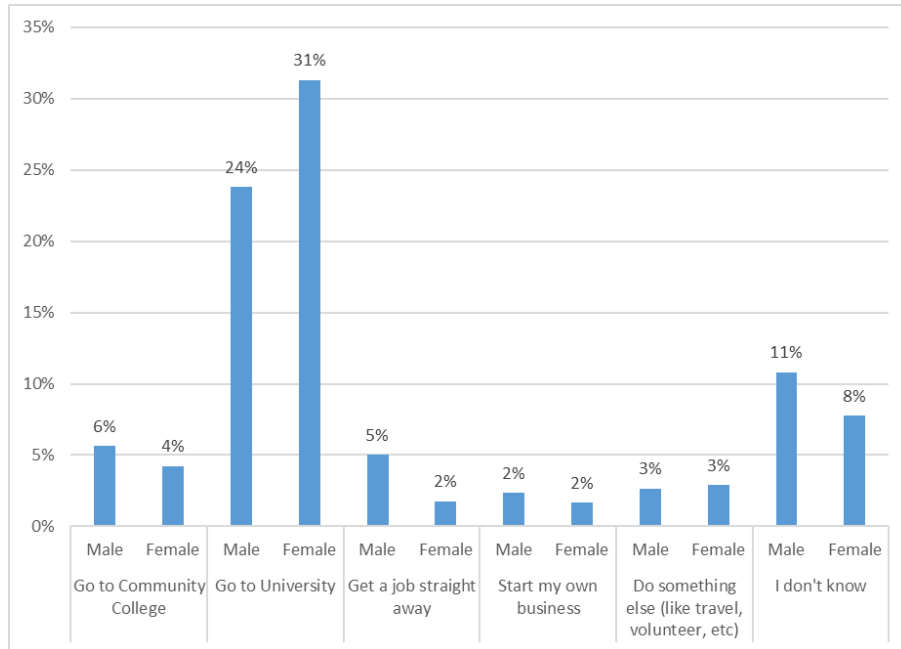
[22] Department of Finance, 2014; Hango and de Broucker, 2007

I think the best ways to get information about my future goals and career are;

This question provided options from which students could select as many responses as they wished. The options included; career days at school, experience, teacher/principal, social media, media (tv, radio), internet, parents and other family members, friends, guidance counsellors, and pamphlets from school.
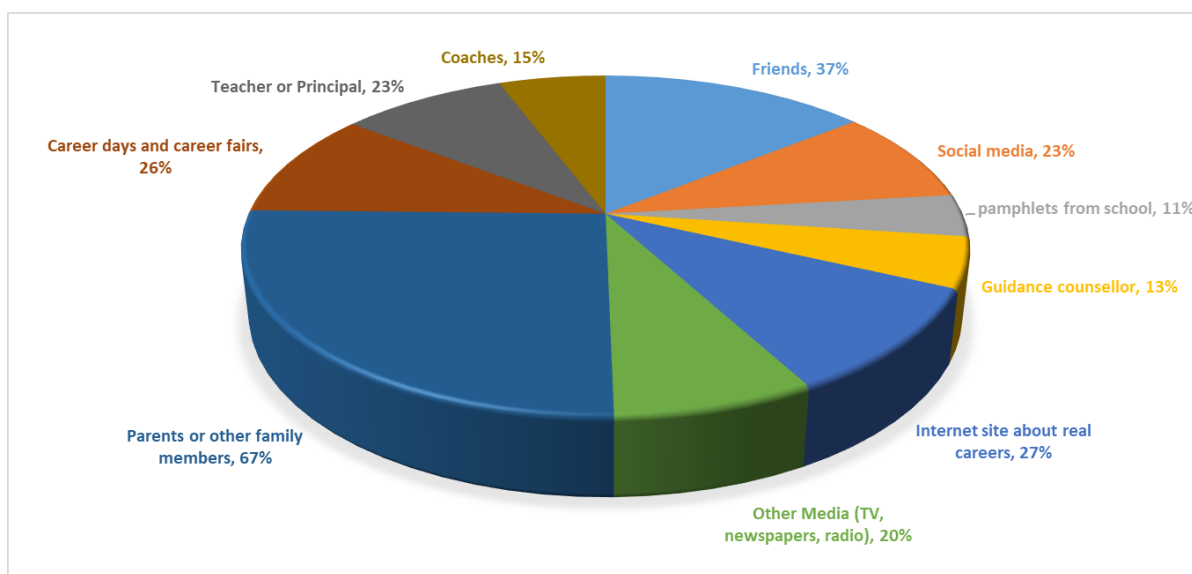
Participant responses indicated that the top three preferred sources of information about future goals and careers are parents & other family members (67%), friends (37%), internet site about real careers (27%). Information sources that received the lowest responses from students included; pamphlets from school (11%), guidance counsellor (13%), coaches & mentors (15%). These low responses to more traditional sources of career information suggest that young people do not seek out and/or trust these sources, and instead rely on more proximal or self-directed sources of information. This may suggest that the roles of guidance counsellors have been shifted (or perceived to be shifted) to crisis counseling rather than career counseling. The also reflects the general trend away from the reliance on the printed word (i.e. pamphlets), and a preference for (and relatively higher trust for) digital sources (i.e. internet sites) of information.

It is noteworthy that responses varied from previous studies in a few key areas. In previous studies studies friends were ranked as the highest . Additonally, teacher or principal (23%) and career days and career fairs (26%) were ranked medium to high in this region, but received among the lowest rankings in other studies. This may suggest that parents and teachers are more actively providing career coaching or engaging in candid converstaions about the future in NB than in other regions. It may also suggest that career fairs have been more effective and engaging, or there is an expectation that they will be in the future. This may be due to the media attention that has been given to large organizations (i.e. Irving) that have conducted broad recruitment from career/recruitment-type fairs in the region.

What job are you most interested in doing when you are older?
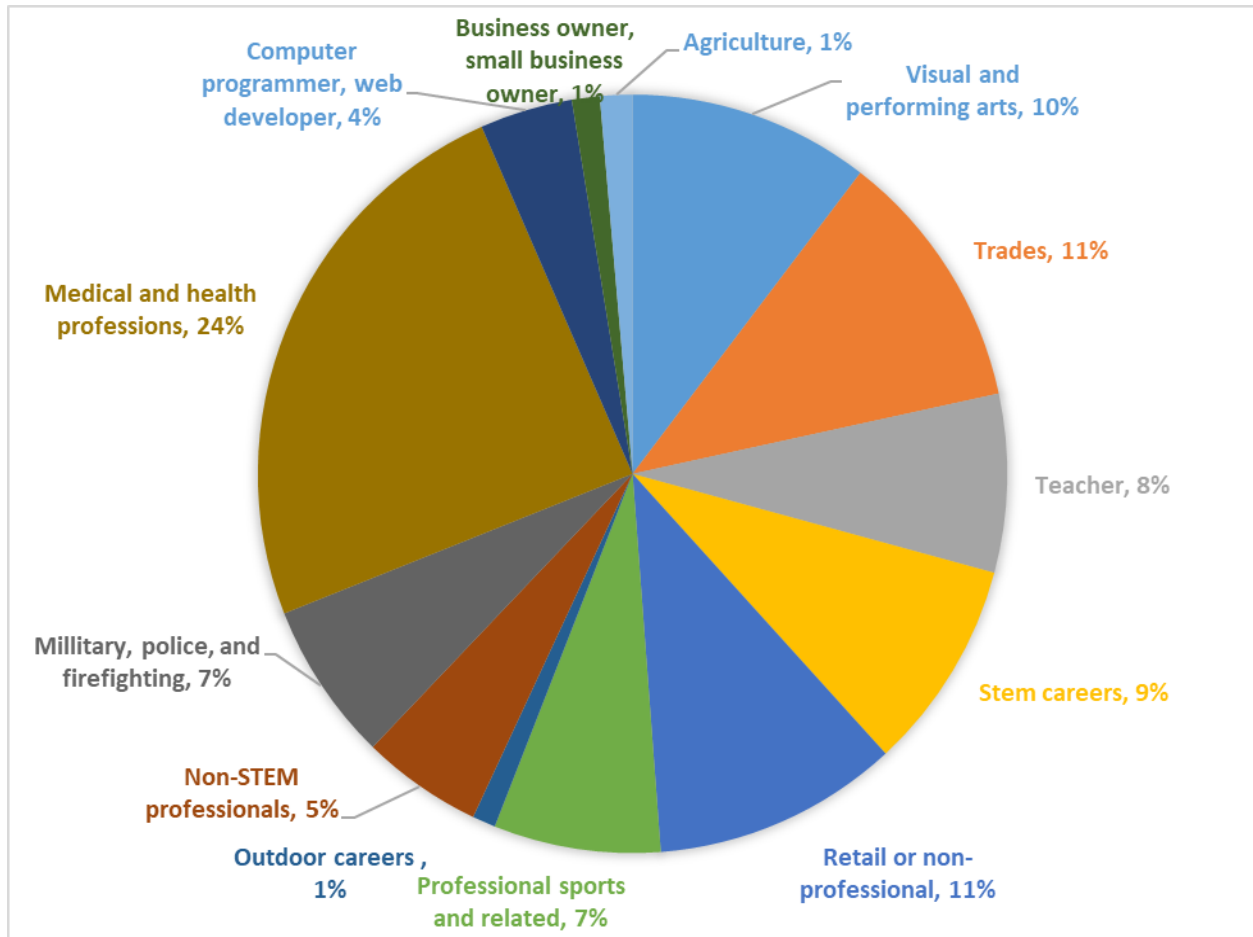
A random sample of 500 was drawn from the full sample group to analyze the open-text responses to the question "*What jobs are you most interested in doing when you're older?*" Responses were coded and grouped into similar themes.

Non-STEM (5%) professional roles include lawyers, accountants, bankers, civil servants, politicians, etc. Medical and Health professions (24%) included doctors, nurses, dentists, physiotherapists, veterinarians, etc. STEM careers (9%) included engineers, architects, and scientists. Visual and performing arts (10%) included artists, 'YouTuber', actors, author, dancer, musicians, singers, and film makers. A wide variety of skilled trades were capture under 'trades'(11%), including welder, electrician, mechanic, hair dresser, and chef[23]. Outdoor careers (1%) included; landscaping, forestry, fishing and other natural resources. (See Appendix B: Career Categories for a full and more detailed description).

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[23] See Appendix B: Career Categories for a summary of how student responses were coded by career category.

The results shown above illustrate a fairly broad range of traditional (i.e. doctor, lawyer, teacher) and a few non-traditional (Youtuber) careers. The results also revealed that some youth are still in the 'dreaming big' stage of their career maturity, with 7% focused on careers in professional sports, and 10% intent on careers in visual and performing arts. These responses reveal optimism driven by interest and talent, however discussions of dream careers is a necessary but insufficient part of career education.

In this question only 1% of participants indicated that they had entrepreneurial intentions (i.e. small business owner), which was lower than the earlier pathway intention question in which 4% of students expressed an interest. This reinforces the need for more entrepreneurship education and exposure earlier on and throughout the full education pathway, to support more strategic (and successful) than serendipitous (and risky) entrepreneurship among emerging workforces across the region.

Only 9% of students identified aspirations towards a STEM career. This result gives some reason for concern as numerous national[24] and international reports[25] and Governments have identified the need for deepening STEM skills to help meet the changing workforce needs and for expanding STEM careers of the future, to meet the Innovation Agenda. Similarly, a future of innovation is dependent on skilled trades, however only 11% expressly identified this as a priority career choice (this was lower than (21% who expressed an interest in a multiple-choice question).

What subjects will help you to get your top choice of job?

The notion of career maturity involves more than just the ability to choose a career goal. Previous studies have shown that the ability to understand the prerequisite qualifications and knowledge that are needed to pursue careers that are of interest[26], and the ability to evaluate the likelihood of a goal in light of one's individual competencies[27], are also factors that contribute to career maturity. This latter factor is likely a stretch, and almost certainly an ego-deflating one for the cohort in question, however these abilities have been shown to begin to develop in early adolescence – between grades 5-9[28].

Students were asked to identify which subjects would help them to get their desired job. This question, and the one that follows, provided insights into students' awareness of subject relevance to careers, and of the importance of courses in opening education pathways. Consistency between career choices and relevant subjects and skills demonstrated awareness and career maturity for students.

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[24] Canada 2067 Report
[25] OECD, Innovation strategy for education and training
[26] Hartung, Porfelli, & Vondracek, 2005
[27] Crites & Savickas, 1996
[28] Hartung, Porfelli, & Vondracek, 2005

Table 1: Top-Three Subjects Associated with each Job Group

Job Descriptor	Top Three Subjects
Medical and health professions	Math, Science, Language Arts
Visual and performing arts	Language Arts, Math, Technology & Trade
Professional sports and related	Physical Education, Math, Language Arts
Military, police, and firefighting	Physical Education, Math, Language Arts
Retail or non-professional	Math, Language Arts, ICT
Stem careers	Science, Math, Technology & trade
Trades	Math, Technology & trade, Physical Education
Non-STEM professionals	Language Arts, Math, ICT
Teachers	Language Arts, Math, Science
Computer programmer, web developer	Math, Technology & trade, ICT

This table of data shows some awareness of and alignment between knowledge/subject competency requirements and identified career. In particular it shows that students are aware of the importance of essential math and literacy skills for all future jobs. Indeed, this group of participants ranked math over language arts as a necessary learning area for future jobs. The results demonstrated a logical connection between subject area and job group which demonstrated that youth are seeing the relevance of their learning to future careers. It also suggests that young people are aware of the importance of core STEM courses across a wide range of careers, even those not directly STEM-related (i.e. non-stem professionals, Retail or non-professional). These responses may also reflect learner effects or participant demand characteristics (i.e. providing the assumed desired response).

What skills will help you to get your top choice of job?

Students were also asked to identify the skills (or competencies) that would help them to get that job. Table 2 shows the top-three skills associated with each job group.

These responses demonstrate some awareness of the importance of 21st century competencies (creativity, critical thinking), and demonstrate the need for more emphasis on the broad range of important competencies for future workplaces (i.e. communication skills, innovation skills). The relatively low response rate for 'computer skills' might be explained by the same assumption of competency as identified above for language arts. The results do show some good awareness that high-demand competencies vary with job group.

Overall, responses did show more awareness of specific skills that are relevant to each role (i.e. critical thinking, creativity for STEM careers; good with people, organized and leadership for Teachers).

Table 2: Top-Three Skills Associated with each Job Group

Job Descriptor	Top Three Skills
Medical and health professions	Hardworking, Problem Solving, Organized, Good at following directions
Visual and performing arts	Creativity, Hardworking, Good with people
Professional sports and related	Hardworking, Leadership
Military, police, and firefighting	Hardworking, Good with people
Retail or non-professional	Good with people, Creativity, Hardworking
Stem careers	Hardworking, Critical thinking, Creativity
Trades	Hardworking, Good with people, Good at following direction
Non-STEM professionals	Good with people, Hardworking, Critical thinking, Good at following direction
Teachers	Good with people, Leadership, Organized
Computer programmer, web developer	Creativity, Critical thinking, Problem solving

Table 3 shows the top three subjects identified overall. Here we see that youth have identified math and science respectively in the top 1 and 2 positions. Language arts was ranked the third-most frequent response, implying that students perceive it to important, but not as important as the STEM areas. This is interesting in that responses to a later question revealed that "good communicator" was rated as a slightly more important skill than "problem solving" and significantly more important than "computer skills". A possible explanation for the relatively low-ranking of Language Arts may be the perceived disconnect between the skills that are connoted by this subject area (i.e. literature studies, compositional structures, prose skills) versus the day-to-day communication skills that are employed in a workplace. This requires that students make the interpretive leap to recognize the functional skills of language arts. Another possible explanation is that employment-related language arts skills (i.e. verbal and oral communication) are perceived as a given for any pathway. And where a skill requirement is ubiquitous, it may seem unnecessary to specify.

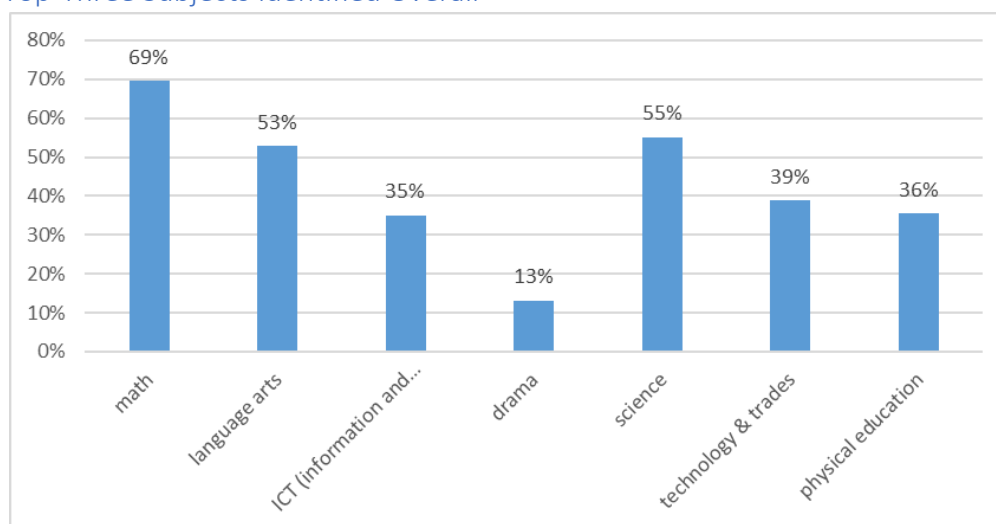Table 3: Top-Three Subjects Identified Overall

Table 4 shows the top three skills identified overall. The skills that had the highest frequency of responses were (in order from most); hardworking, good with people, problem solving, and organized.   The skills that received the lowest response overall were (in order, from least); inventive/innovative, programming skills, artistic skills and computer skills.

The descriptor 'hardworking' was identified as a priorty skill for nearly every job, and was the top skill identfied overall[29]. This might reflect the messaging that youth hear at school and at home about the importance of work ethic. The prioritized selection of 'hardworking' may also show participant demand effects (i.e providing the 'right answer'). Youth also identified 'good with people' (41%) and 'problem solving' skills (28%) indicating some awareness that future careers will be characterized by collaborative teams oriented around creative problem solving.

Table 4: Top-Three Skills Identified Overall

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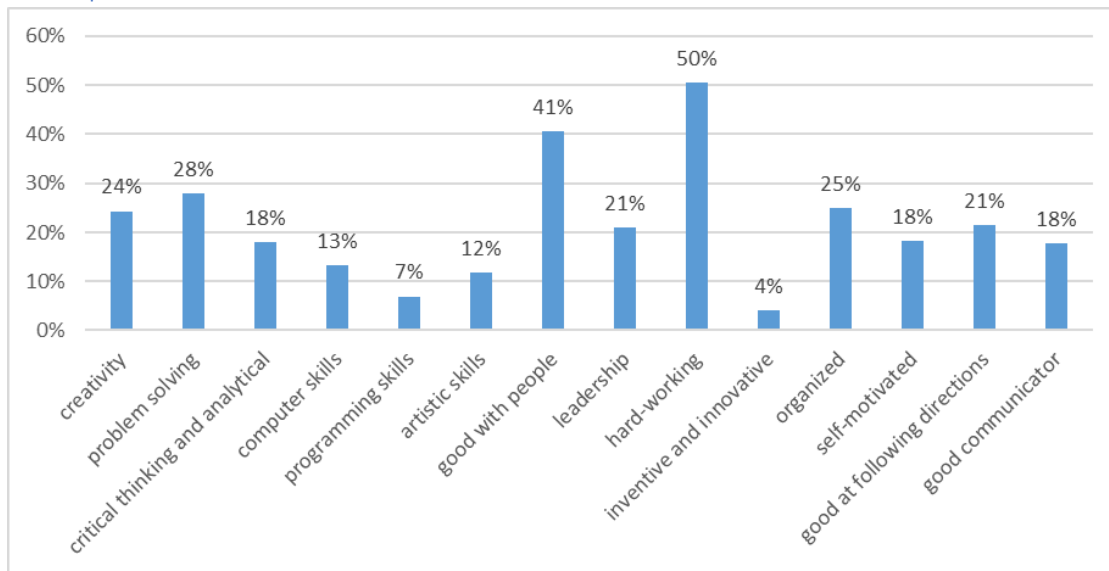
[29] This was not the result of primacy effect or order effects, as 'hardworking' did not occupy the first selection position (it was 8th). The sequence of common top 3 responses was not consistent with the sequence in which these options were presented to participants – which suggests that students read through the choices and went back and made their selections – there was no evidence of response bias due to order effects.

Interprovincial Mobility
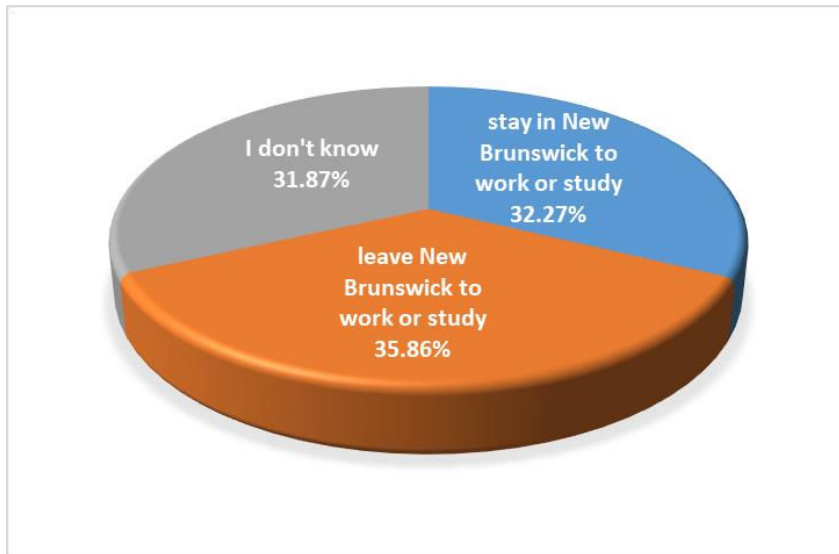
After I finish high school I would like to; (mobility)

More than a third of youth in New Brunswick indicated that they are already considering leaving the province to study or work, and nearly another third aren't sure. This can be a worrying result that needs to be analysed against further data regarding perceptions of careers and opportunities regionally to determine why they want to leave.

By gender
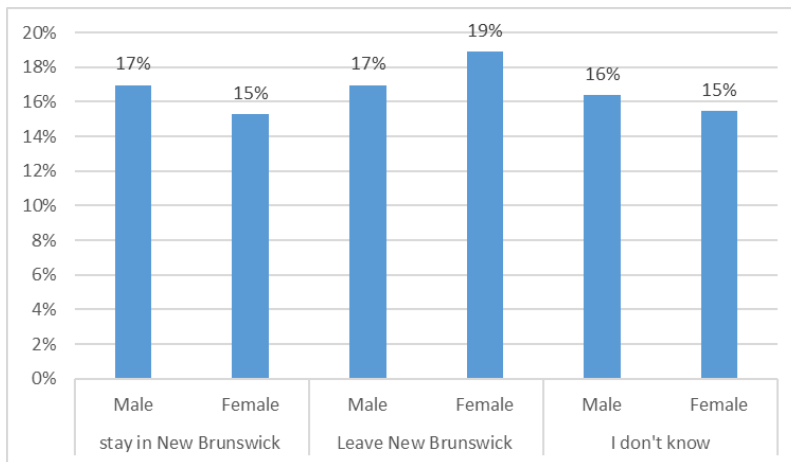
There were no significant response differences by gender or grade, which is interesting as one might expect to see an increase in the desire to move (and gain locational indepence) as students get older, but this effect wasn't evident in the responses.

A similar question was posed towards the end of the survey to evaluate consistency of responses. This question asked; "Do you plan to live and work in New Brunswick when you're older?". Affirmative

responses indicating an interest in remaining in New Brunswick declined from 32.27% to 30.32%, and intention to leave also declined from 35.86% to 33.33%, while uncertainty increased from 31.87% to 36.35%. This is a mild shift in responses that could have been due to several factors; including learning effects -a type of order effect (i.e. as they worked through the survey they developed more awareness of the factors they need to consider in making decisions about their future, or became more aware of the options available to them, which led to less certainty). This mild shift could also have been due to response fatigue, or a perception of near future (i.e. after high school) and distant future (i.e. live and work when older). These possible learner effects of the survey can be considered a positive outcome of the survey, as it appears to have prompted students to think more about their future options.
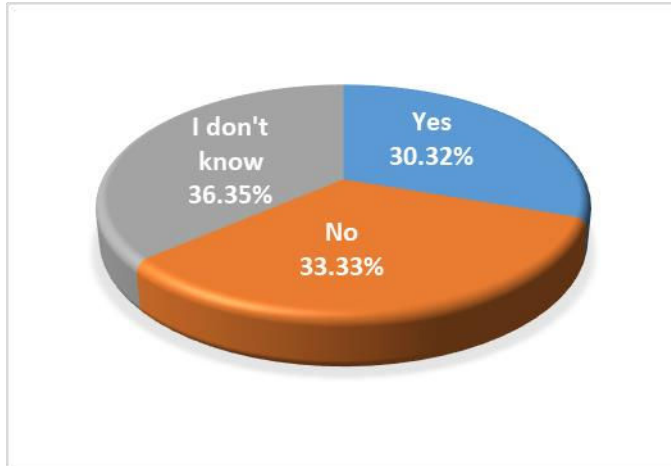
Oceans-Oriented Education and Careers

The following question was posed to serve two key objectives; primarily to assess participants' purported current awareness of ocean-oriented careers; and secondly, to ostensibly build some awareness of the scope and variety of ocean-oriented careers to prepare them to respond to the question that followed regarding interest in working in the marine industry.

Students were asked; *In New Brunswick there are many different kinds of jobs in the marine industry. Here are some examples. Tick the ones that you've heard of*; (awareness)

Types of Careers in the Marine Industry
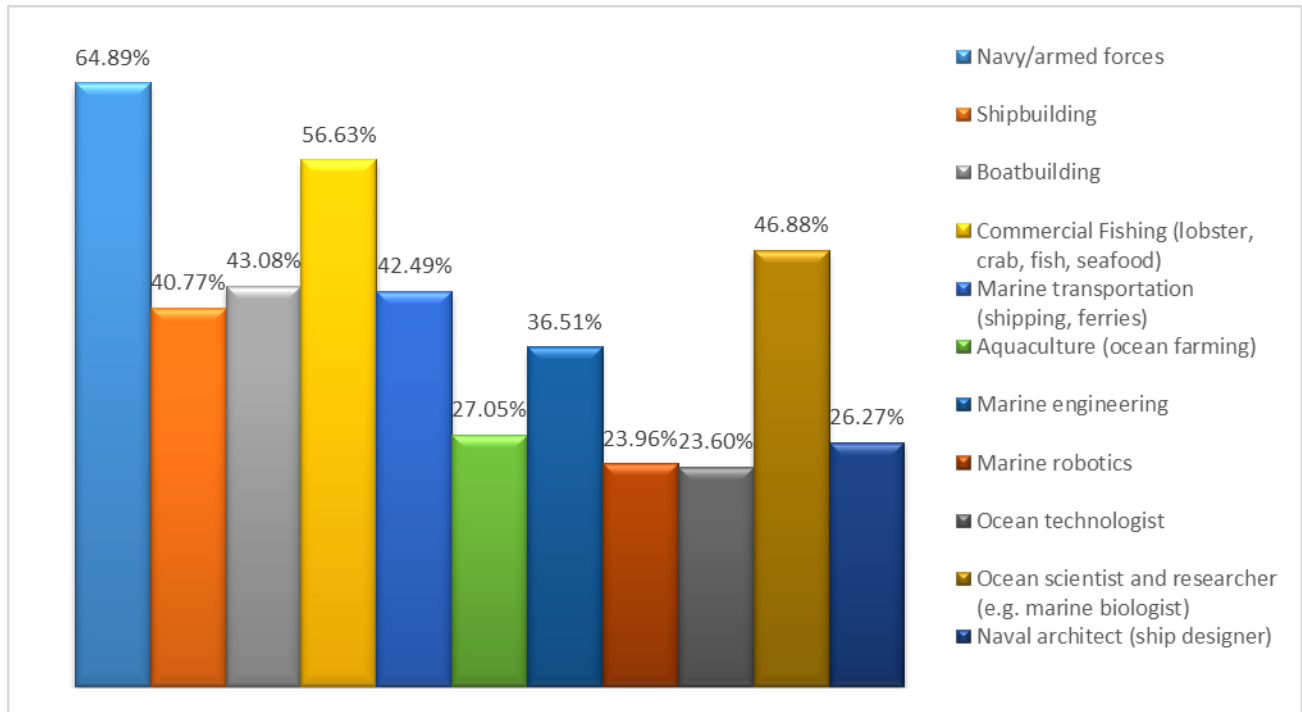
The survey results show better-than-anticipated awareness of careers in the marine industry generally, however given the regional profile of some careers, there was surprisingly lower awareness of shipbuilding (65%) and ocean scientist (47%).   As expected, the highest awareness levels were for traditional marine careers (i.e. Navy – 65%; Commercial fishing – 57%). However, the results also showed a general lack of awareness of emerging regional sectors (i.e. ocean technology – 24%; marine robotics – 24%; aquaculture – 27%). This points to the opportunity for more curriculum links and awareness programs that expand teaching and learning beyond marine ecological and life science concepts, to a broader range of oceans STEM topics and related careers and sectors[30].

Grade and gender were not found to be predictive variables for awareness of ocean oriented career types.

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[30] It is important to note that vocabulary may have been a limiting factor in student responses (i.e. Naval architect, aquacutlture, marine fitter are terms that may have been unfamiliar). Response rates may have been higher if descriptions had been used (i.e. ship designer, farming food from the ocean, underwater welder, shipping and ferries), however this would have increased the reading requirements for the question and may have in turn produced more response fatigue, resulting in equally low response rates.

Are you interested in a job in the marine industry?
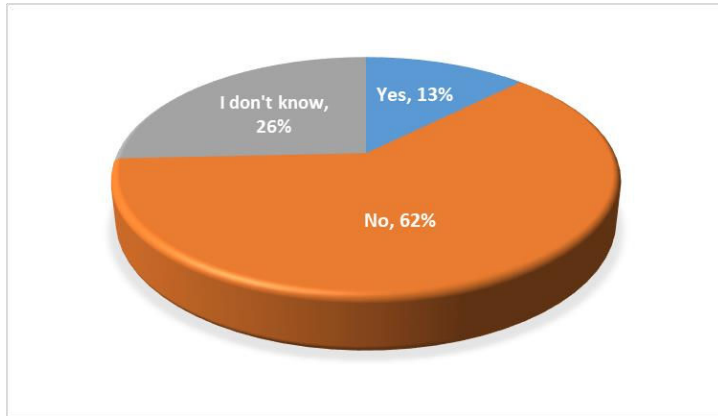
Responses show a significant lack of interest and intention (62%) to pursue careers in the marine industry. It is notable that in a Maritime province with a strong ocean heritage, only 13% of students indicated an interest in a marine oriented career. Based on previous question it is likely fair to suggest that students aren't aware of the broad range of career options available to them in the marine industry.

By gender

Boys were slightly more likely to express an interest in the marine industry, and females were slightly more likely to communicate a lack of interest. Most notably, nearly half of all participants provided a negative response. It is notable that 37% of students aren't sure. This response might have been derived from the previous question that broadened their awareness enough to consider the option (or not provide a negative response).
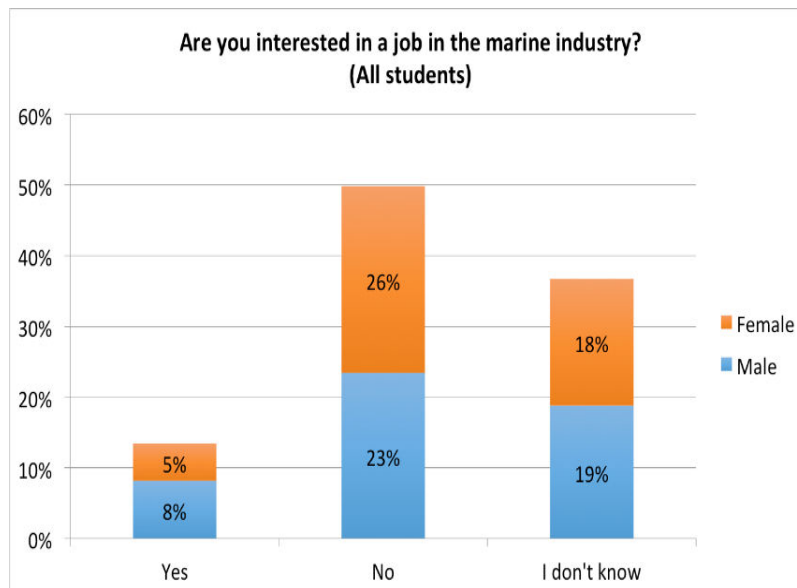
If you're not interested in a job in the marine industry, explain why;

Students were provided an opportunity to elaborate on their 'no' response with open-text. A random sample of 509 of these open-text responses were analysed for common themes. The most common response (47%) indicated a general lack of interest in the Marine Industry, regardless of the career area or sector.
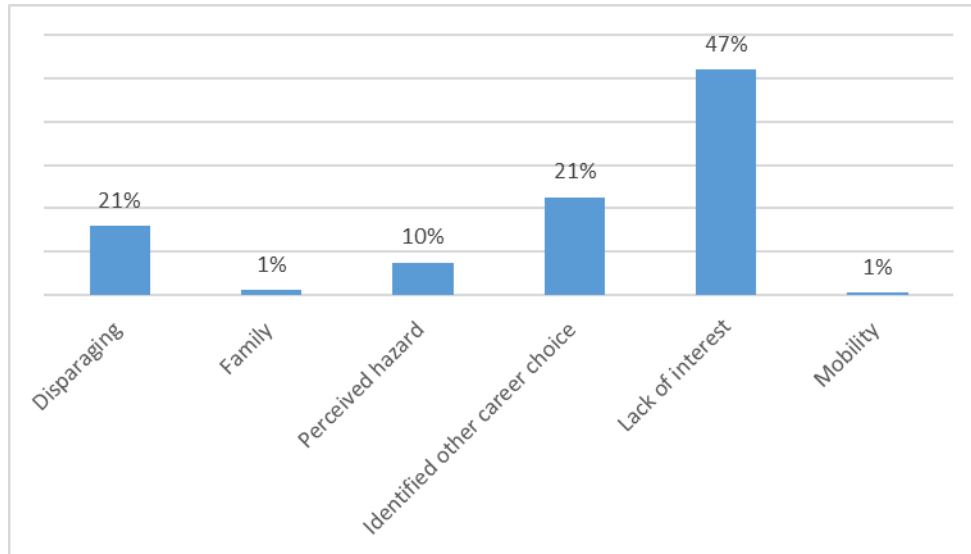
Some examples of responses coded as lack of interest include;

- *"Because no one told me about it" (grade 6 male)*
- *"because i'm not interested in the ocean and animals" (grade 7 female)*
- *"I do not find anything within the marine subject interesting to me, I find I'd be able to work better with a job that suits my interests." (grade 9 female)*

The second and third-most common responses identified another career choice or preference and disparaging comments (each 21%) . Some examples of comments that were coded in the other career choice category include;

- *"I already have an idea of what I want to be when I am older and none of the jobs on the list interest me" (grade 7 female)*
- *"I would like to work in law. Plus these jobs don't really interested me. Sure I would take the job if there was nothing left to chose from cause I do know some stuff in this category of work" (grade 9 female)*
- *"It sounds pretty cool but I'd rather do something to do with technology, physics and writing" (grade 6 female)*
- *"I love the ocean but i would like to be a robotic engineer on land or something hands on" (grade 6 female)*

These first two categories of responses included numerous comments that indicated a lack of awareness or knowledge of the industry or of the broad range of careers in the industry. On a positive note, these groups present the most opportunity to develop interest through exposure programs and experiential

learning and shift their thinking. These students were more likely to communicate a negative perception that is can be shifted with information and exposure.

Some examples of disparaging responses include;

- *"i don't want to smell like fish" (grade 6 female)*
- *"Because I'd rather not waste my life in New Brunswick and spend time in the ocean and potentially get sea sick." (grade 8 female)*
- *"because it sucks and im scared of boats" (grade 7 male)*
- *"Because i don't like sharks, jellyfish and a lot different seal animals or a lot of the things under the water." (grade 6 female)*
- *"Cause it makes no moneyr" (grade 6 male)*
- *"It does not interest me what so ever , yes the ocean is fascinating very much so , but that job seems like a hassle , amd for someone like me thats a waste of talent" (grade 8 male).*

When we combine disparaging responses with hazard responses (10%), we find that nearly a third of participants expressed perceptions that the industry is dangerous or undesirable. Some examples of responses coded as 'hazard' include;

- *"not for me i don't like drowning" (grade 8 male)*
- *"I have millions reasons why and to name a couple I want to be a binesswoman and my gradfather is almost death because he worked in a fish factory" (grade 6 female)*
- *"this is something that makes me feel unsafe because i dont like boats at all" (grade 6 female)*
- *"I get seasick" (grade 9 male)*

These responses reflect attitudinal and fear-driven bias challenges which are more difficult to correct and overcome. This demonstrates an important opportunity to provide more experiential oceans education broadly to all students, to allow students to develop more positive familiarities and relationships with the oceans around them, and to change the narrative and perceptions of oceans-related careers in Canada.

Many of the responses reflected a general lack of awareness and understanding of the breadth and scope of ocean-oriented careers and of the skills and competencies associated with them.   For example; "*Because the marine jobs is not really needed in this time. Like: there is no more war in the world so we don't need to build warship or something's like that. People already know how to fishing so we don't need the marine technology anymore.*" (grade 6 male). With more awareness and exposure to demonstrate the breadth of options (i.e. marine-oriented math and science careers, engineering careers) and the future growth of the industry across the region, this group of respondents could be more open to a marine oriented career.

Curriculum Relevance

Curriculum relevance is viewed as an important factor in development of awareness of workplace skills and competencies. The following question was asked to determine students' perceptions of awareness of why they are learning what they do, and of how it connects to future careers.

At school my teachers help us understand how the things we learn in math and science relate to real world jobs.
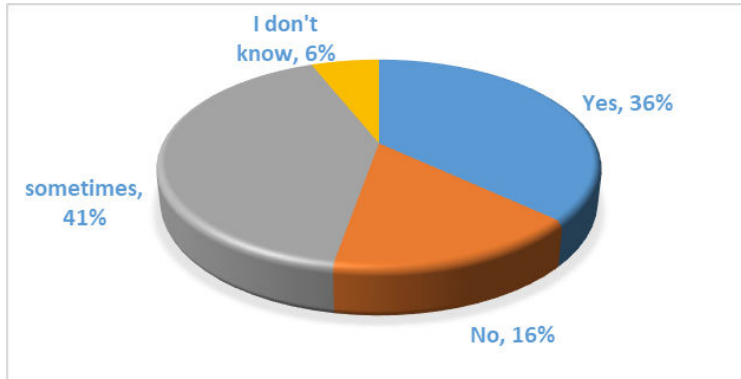
Positive responses (i.e. yes – 36%) demonstrate that many New Brunswick students feel their teachers are anchoring their learning in real-world relevance. However, responses indicate that there is still an opportunity to create stronger connections between curriculum content and real world skill and knowledge application.

Table 5: Showing responses of perceptions of relevance by grade
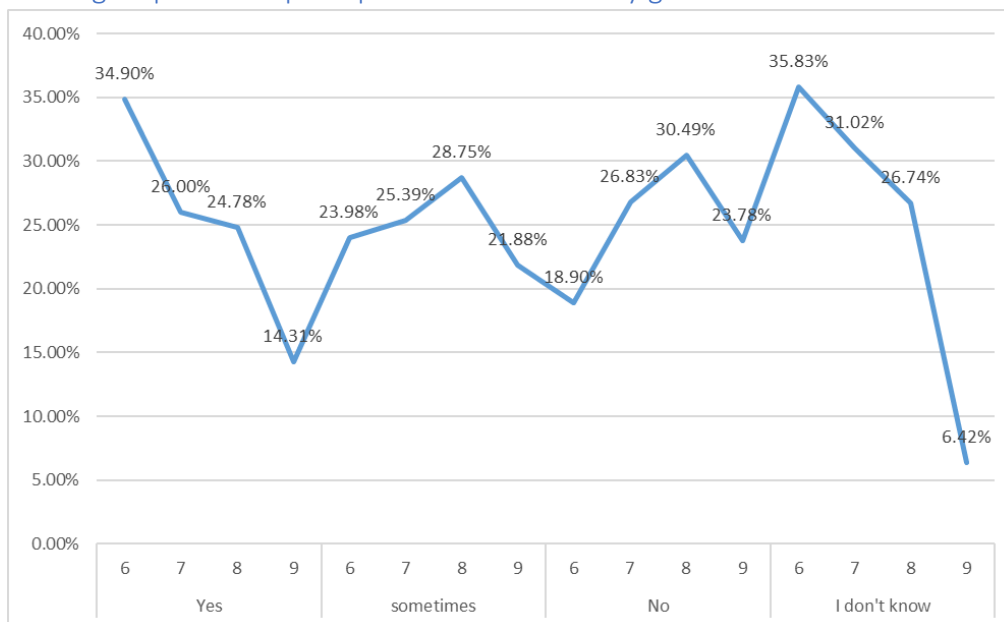
There were no significant response differences by gender, however there was a decline in positive responses (yes) and uncertain responses (I don't know), and a corresponding increase in negative (no) responses with older grades.   Some of this apparent change is due to the smaller proportion of grade 9

students participating in the study. However; some of the change may also be due to the tendency for the trust relationship to change for students as they get older (i.e. around grades 8-9)[31].   This finding is also consistent with research that shows that students become more disengaged from school around this same age[32]. Another possible explanation is that the increasing complexity and abstract-nature of subject matter between grades 6-9 makes the relevance less obvious, requiring more explicit statements of relevance from teachers to connect abstract concepts to real-world application.

Interest in Careers in Skilled Trades and Technology

Do you know someone who works in a skilled trade?
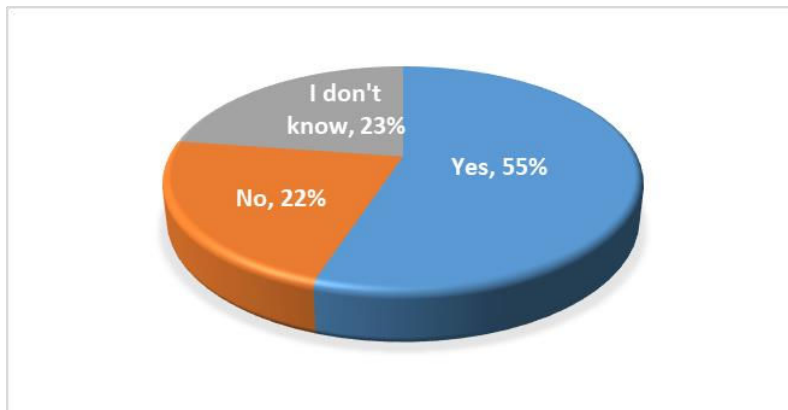
A significant proportion of respondents did indicate an awareness (55%) of someone who works in a skilled trade. There were no significant response differences to this question by grade or gender. This question provided some insight into students' awareness of skilled trades roles, which provides some context for students to evaluate their interest in participating in one of these jobs. The reported awareness level was higher than expected, suggesting that students might have provided an affirmative response with very distal knowledge of a skilled tradesperson (i.e the person who fixed their sink) versus a proximal relationship (i.e. friend, relative or neighbour). This might inflate the 'awareness' scores, resulting in students who have 'heard of' skilled trades, but who don't possess enough awareness of the careers to provide an informed response to the questions below.

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[31] Henry, Knight, & Thornberry, 2012; Schosser, 1992
[32] Perry and Wallace, 2012

Are you interested in a job in a skilled trade?

Students indicated a relatively strong interest level in skilled trades (21%), with even more 37% responding 'I don't know' which indicates a willingness to consider this option, with more information and experience. A negative (no) response suggests an unwillingness to consider the option and can reflect strong bias against this pathway.
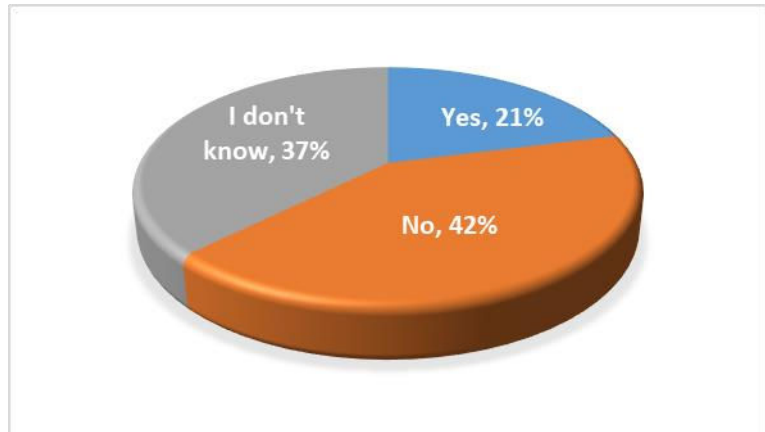
By gender;
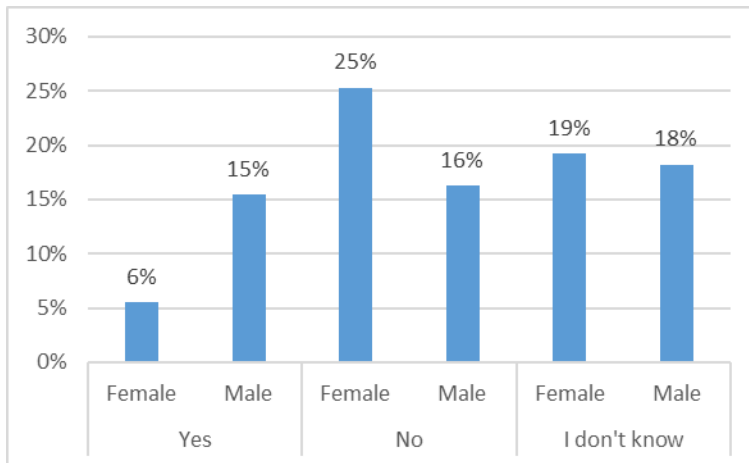
Females were significantly more likely to report that they were not interested in a skilled trade (25%), males were more likely to report that they were interested (15%), and uncertain responses were almost equal. These results are consisent with the ongoing gender bias in skilled trades.

If no, explain why; (open-text responses)
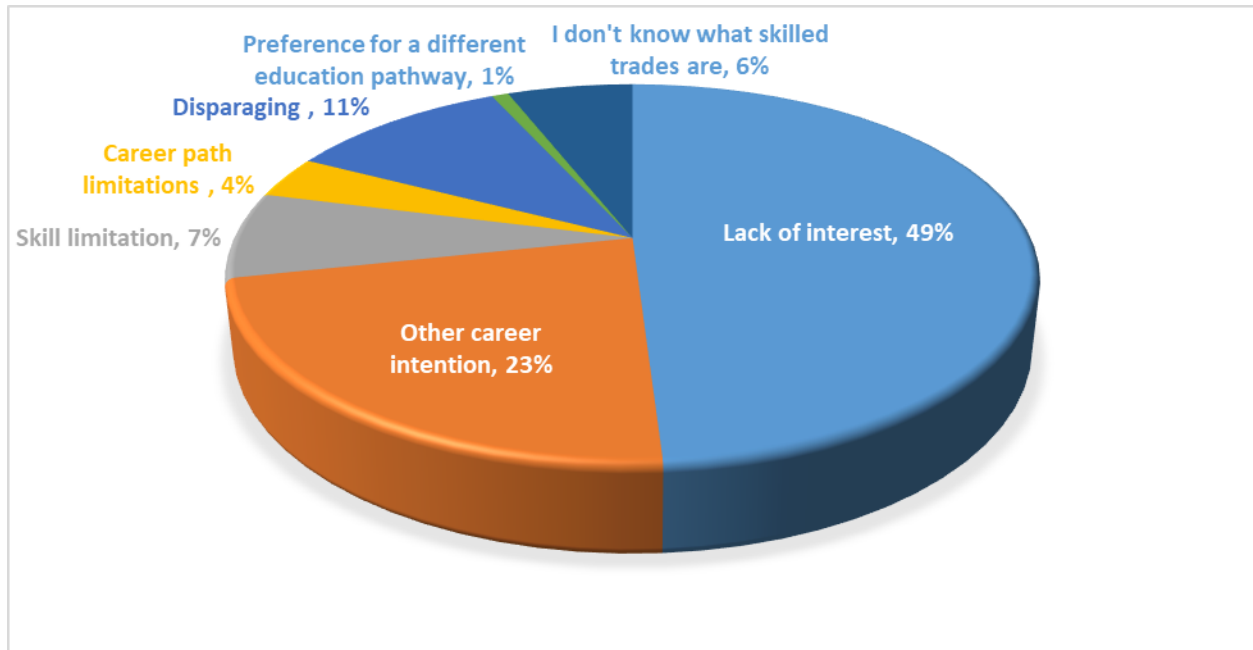
Students who indicated they were not interested in a job in a skilled trade were provided an opportunity to elaborate on their decision with an open-text response. A random sample of 500 responses was pulled from the full sample, and these responses were coded according to common themes.

The most common themes emerging from the responses were, lack of interest responses (49%), such as;

- *Because the jobs listed above don't really interest me or suit my personality and I wouldn't enjoy doing them. They're great jobs (don't get me wrong) but they're just not for me. (grade 6 female)*
- *It's not my kind of job (grade 7 female)*
- *It's not a job that I am interest in and it's not something I'd like to do (grade 7 female)*
- *Trades are the best thing to get right now but I'm not interested (grade 8 male)*
- *I've never been interested in those jobs (grade 9 female)*
- *I'm a girl not interested (grade 9 female)*

and other career intention (23%), for example,

- *I want to be a music teacher and this does not requier trading i dont think (grade 8 female)*
- *I'd like to work on land as a police officer or something in that category (grade 8 male)*

Some of the responses citing a different career intention indicated clear lack of awareness, such as;

- *It sounds cool but I'd rather do something that has to do with technology, physics or writing. (grade 6 male)*
- *I want to go more into sciences (grade 9 male)*
- *Because I've always wanted to be a technician (grade 6 male)*

- *Cause I woulld like to study marine animals (grade 8 female)*

Other responses indicated concern of skill limitations (7%), for example;

- *I don't think I'd be good or useful in that job. (grade 8 male)*
- *because i wouldnt know what to do as a technician or a meachanic (grade 8 female)*
- *Because im weak (grade 6 male)*
- *i dont think im a very good hands on person and all ready know what i want to be (grade 8 female)*
- *because im not good will tools and electronic (grade 7 female)*

and some responses (4%) reflected concern over career path limitations, such as;

- *Most of the options are limited, I'd like to go beyond that (grade 6 male)*
- *No,because I want to be something bigger,that I enjoy (grade 7 female)*
- *I don't know I don't really wanna be any of those things I wanna have a job that I know I can support my family with once I have a family and some of those jobs aren't very reliable (grade 7 male)*

The remaining responses were coded as disparaging (11%), for example;

- *Because its boring (grade 7 male)*
- *I honestly don't want to be stuck in a job like that where I have to wake up early work hard all week just to get paid a tiny amount of money (grade 7 male)*
- *Because I wanna be successful (grade 7 female)*
- *Because I do not like to do hard woodwork and if i do anything in the skilled trade I have failed in my life (grade 8 male)*
- *because it's not really interesting and you don't really get to do much (grade8 female)*
- *I'd rather not have a low paying job fixing pipes, working with grumpy men, having to look like a slob. (grade 8 female)*
- *There is little creativity, and any creativity or freedom must be meticulously thought out. (grade 9 female)*

Given the prevailing stigma of skilled trades roles, it was expected that disparaging responses would be higher than reported. This result may suggest that lack of awareness has both limited young peoples' views of their options, and sheltered them from the negative narrative regarding skilled trades careers. Where many young people are still in the dreaming phase of their career exploration, it may be that proximal others (friends and family) haven't begun to actively influence them to dismiss certain options yet.

Another explanation for the low disparaging responses may be due to priming effect. The previous question asked participants if they knew someone who worked in a skilled trade. This question may have brought to mind a specific (and possibly proximal) someone (for almost 55% of respondents) when answering this question, and students may not have wanted to contribute a disparaging comment that would seem attributed to that someone. Participants may have prefered to respond 'not interested', as this response omitted any judgement of the career path (and of the someone in mind). In the following, a series of true/false questions provides more insight into the actual attitudes and stigma surrounding skilled trades roles.

An additional category was added to the analysis of these open-text responses due to the significantly high number (6%) of participants who responded that they did not know what skilled trades were, for example; *because i don't have a clue what the job is (grade 6 male)*

Table 6: Reasons for indicating 'no interest in a skilled trade', with knowledge of someone who works in a skilled trade
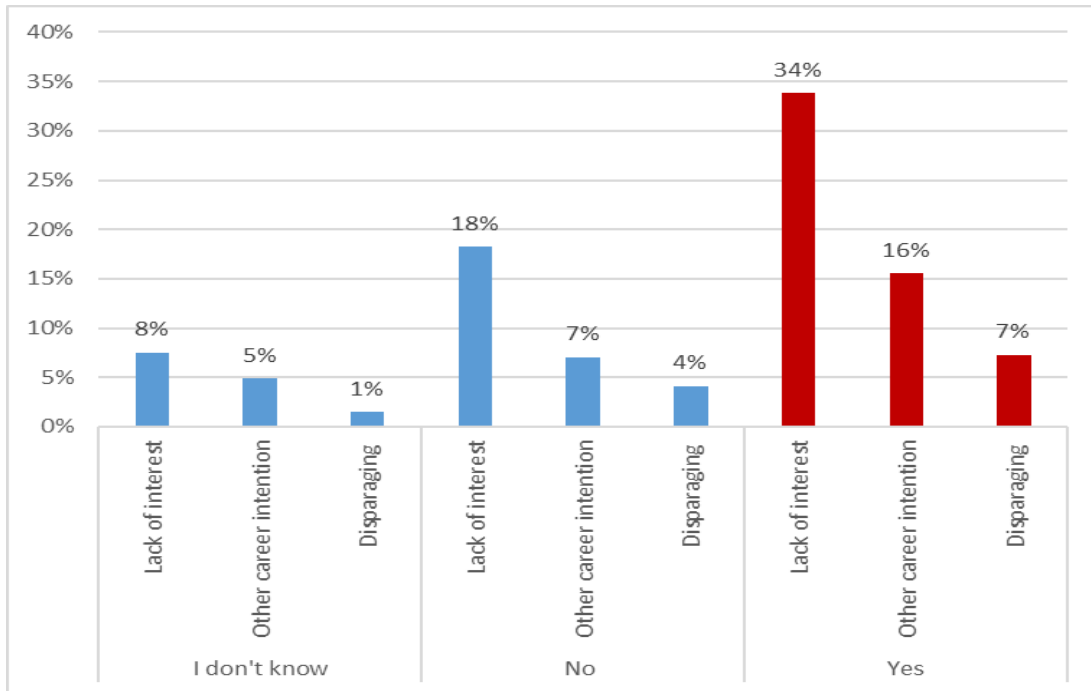
When these responses were examined along with the variable question "*do you know someone who works in a skilled trade*", those who responded yes were more likely to elaborate on why they weren't interested in a job in a skilled trade.

Familiarity was also found to be a predictor of affirmative responses to the question, "are you interested in a job in a skilled trade?". 18% of students who knew someone in a skilled trade said they were interested in a skilled trades job, whereas only 2% of students who did not have familiarity or who weren't sure, responded 'yes'.

It is important to recognize the value of both an informed yes and an informed no. A key outcome of any awareness and exposure program is to support students in making an informed decision about whether or not to pursue a particular pathway.   Without some awareness, students are too often dismissing some career options without consideration, or defaulting to others, with similarly little information.

Gender and Grade
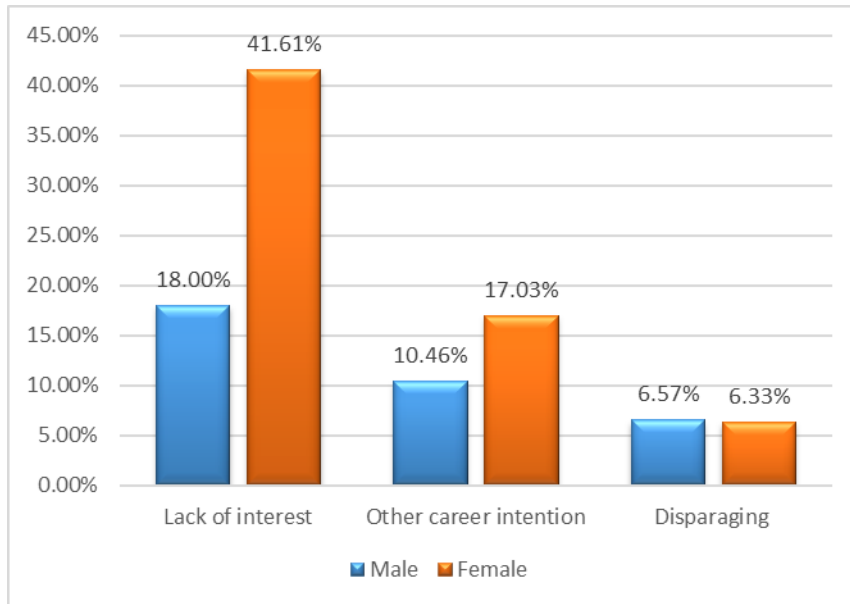
In examining the top 3 response-types, females were found to cite lack of interest and other career intention more often than males. This is consistent with other data that showed females to communicate more certainty about a future career intention over males. The genders were found to be equally disparaging.

There were no significant response differences by grade.

Perceptions of Skilled Trades

To prompt more detailed data about students' perceptions of skilled trades, they answered the following true/false questions. Students were able to repond, true, false, or I don't know. The *I don't know* option was included to mitigate uncertainty being captured as an affirmative/negative response.

What statements do you believe to be True/False about skilled trades?

Table 7: Perceptions of Interest, importance, and opportunity (True/False)
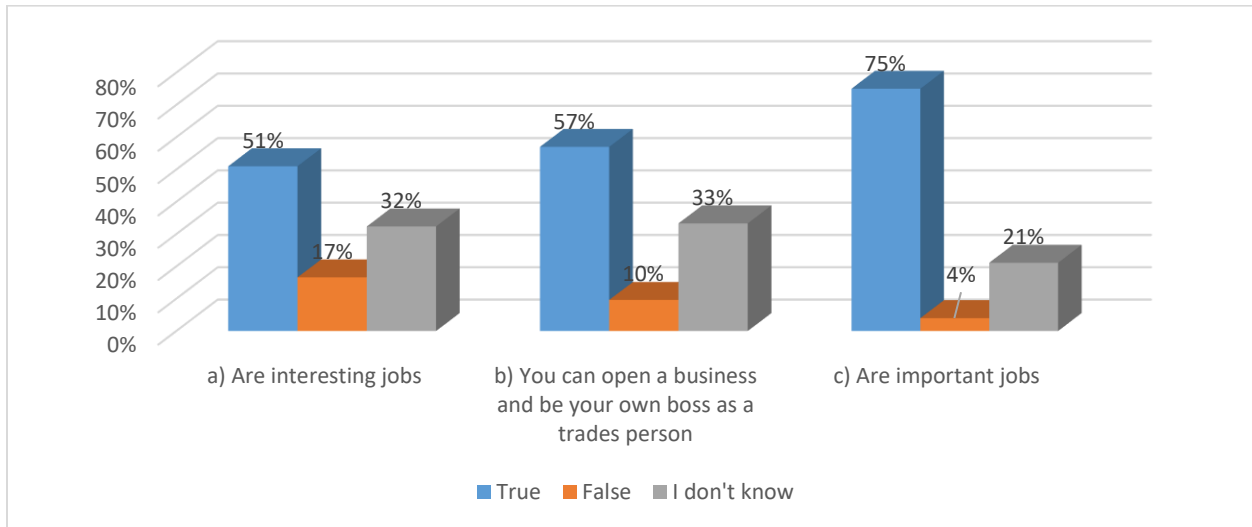
Table 7 shows responses to questions a, b, and c, which all received more positive responses, and less negative responses overall.   These responses, in particular the 'no' responses, demonstrate that youth in the region have an overall positive impression of the social desirability of these roles, as reflected in their promise of interest, importance, and opportunity. It was also interesting to note that more than half (57%) of students recognized the entrepreneurial opportunities associated with skilled trades roles. Interestingly, of the ~4% of students who did indicate an interest in entrepreneurship, only 5% of those expressed an interest in opening a business that was skilled trades-related. This suggests that, while students have some awareness of this option, entrepreneurship is not the pull that draws students along a skilled trades career pathway.

Table 8: Perceptions of Cognitive Requirements for skilled trades jobs
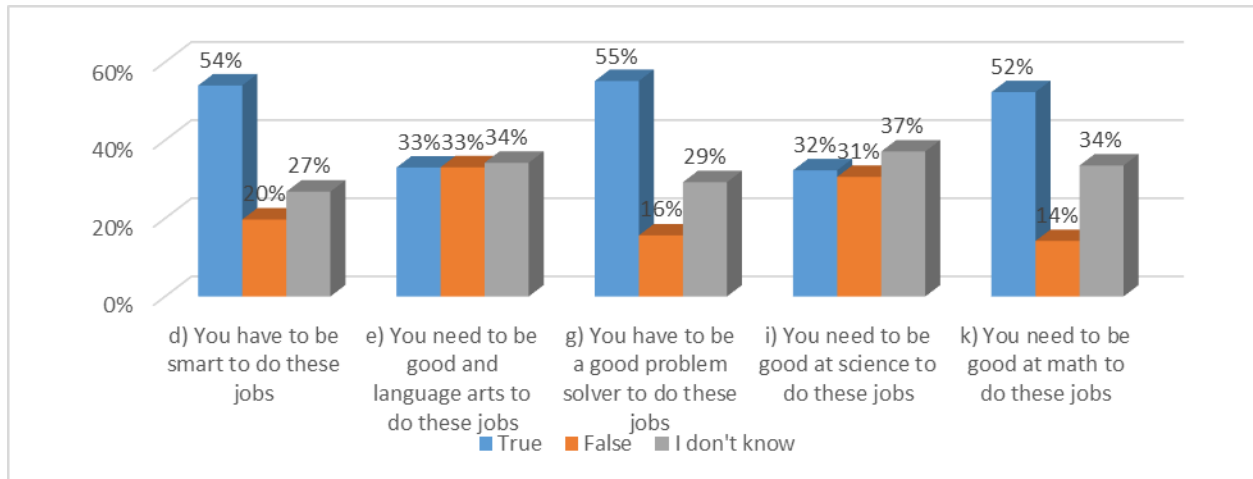
Table 8 shows responses to questions d, e, g, I, & k. With these variables we started to see a decline in positive (true) responses, and more negative (false) or uncertain (don't know) responses. These statements evaluated participants' perceptions of the cognitive requirements for skilled trades jobs, including the need for competency in language arts (33% positive responses), math (52% positive responses) and science (32% positive responses). A general statement about the requirement to 'be smart' was included to capture young peoples' perceptions of skilled trades jobs as generally the work of 'smart' people, to which only slightly more than half of students responded 'true'.

These responses are more consistent with the general stigma (anecdotal) that continues to linger around skilled trades roles. Broadly speaking, these roles tend to be perceived to require brawn over brain, and to require physical versus verbal interactions. These variables also relate to the social desirability of skilled trades roles, insofar as cognitive-oriented roles are socially privileged over physically-oriented ones (with the exception of professional sports).   In light of the responses captured in these two tables it seems that while the majority of students perceived these roles to be interesting and important, they did not possess the cognitive affirmation to render them as as legitimate options for themselves.

Table 9: Perceptions of social desirability in terms of prestige, compensation, and approval
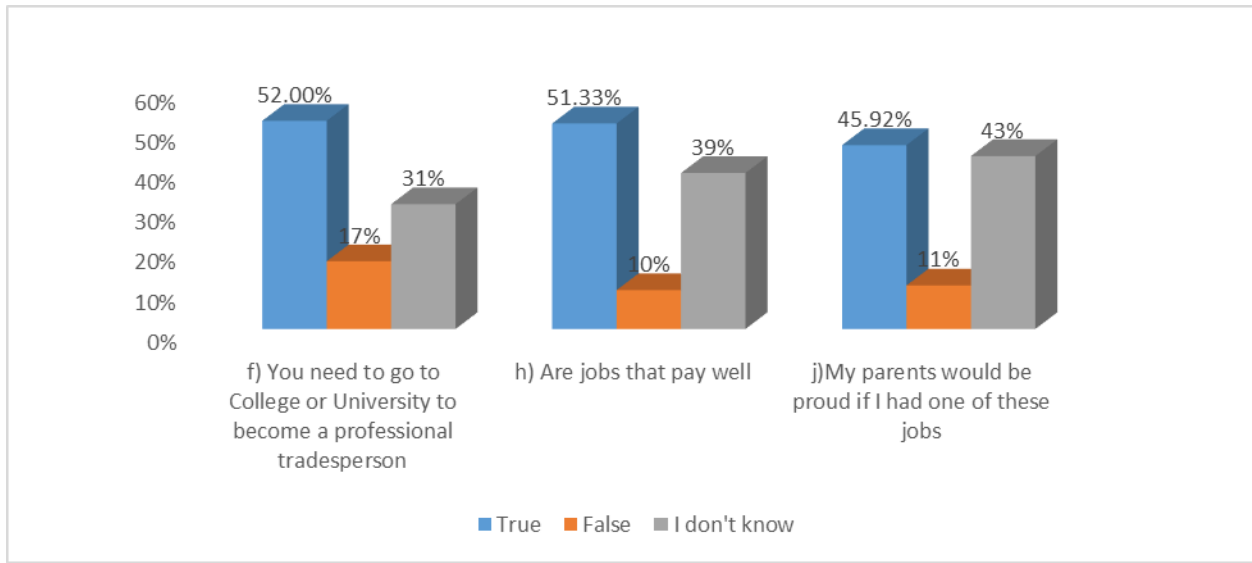
Table 9 shows responses to questions f, h, & J, which captured participants' perceptions of the desirablity of skilled trades jobs, relating to three key motivators; education pathway (prestige), money (compensation), and parental approval. These responses provide more insight into perceptual barriers to participation in skilled trades, and revealed strong stigma builders for these careers.

Educational pathway, compensation, and parental approval have already been established in this report as powerful influences of young people's career perceptions and intentions. This data, in particular the 'don't know' responses, do however point to opportunities to shift young peoples' perceptions. Awareness and exposure programs aimed at all students will help to correct and inform educational pathway perceptions. Similar initiatives aimed at parents will help to inform this group of influencers, and hopefully lead to more validation of the skilled trades pathway. Perceptions of fair/good compensation are relative and individual, and thus more difficult to address. However, pairing awareness programs with current labour market information (that includes job availability and compensation) will help to provide more-informed perceptions among youth and their parents.

The Influence of Perceptions on Interest

The following illustrates a comparison between true and false responses (perceptions) against interest in a job in a skilled trade.
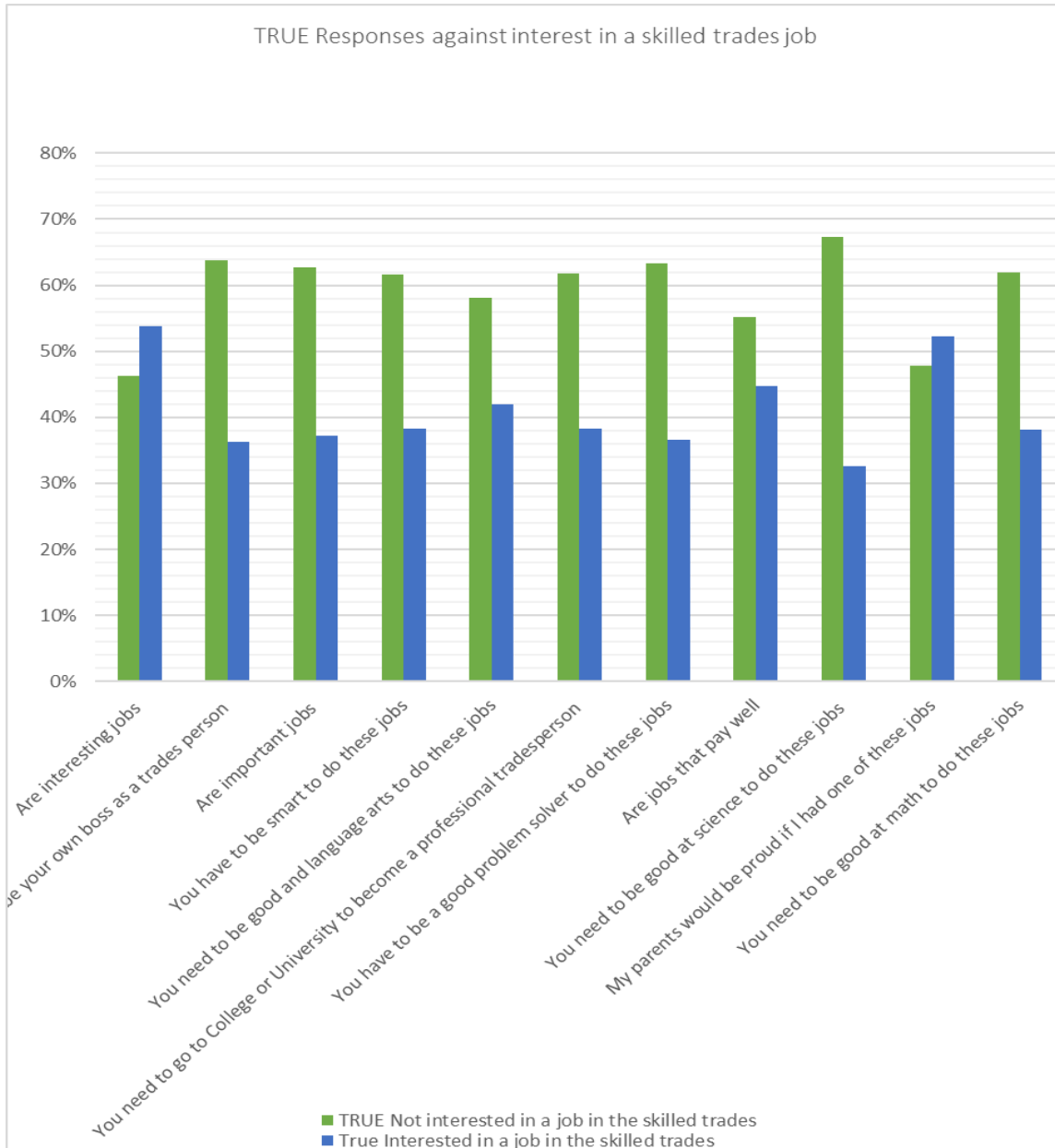
This data shows that students who are NOT interested in a skilled trades gave positive (TRUE) responses to the comments as frequently as (and often more than) students who were interested in a skilled trades job. This suggests that it is not the negative perceptions of the job characteristics (that were presented to them) that dissuades them from these jobs. That is, it is not so much a negative perception of skilled trades careers that motivates the dismissal of this option, but rather the lack of interest – which

itself seems to be due to lack of experiential awareness with these roles. Most youth seem to be telling us that these are good jobs – for someone else, but not for them. This may be due to the plan A academic default pathway which means that they haven't given an alternative much thought. These results may also be due to the priming effect already mentioned.

What is notable is the second bar – 'You can open a business and be your own boss', which is almost half for youth who are interested in a skilled trades role. Similarly, the chart below shows that of youth who expressed an interest in a skilled trades job, more than a third answered 'false' to the question "you can open a business a be your own boss". This reinforces the point made earlier in this report that students who are considering a skilled trades pathway are not thinking entrepreneurially, and this is not a driver for interest in these roles. A second notable result is that the two questions that had a higher true response rate for 'interested' youth reflected perceptions of parental approval of this pathway, and perceptions that the jobs are themselves interesting. This reinforces the self-actualization motive in career selection as well as the importance of parental endorsement of a proposed pathway.
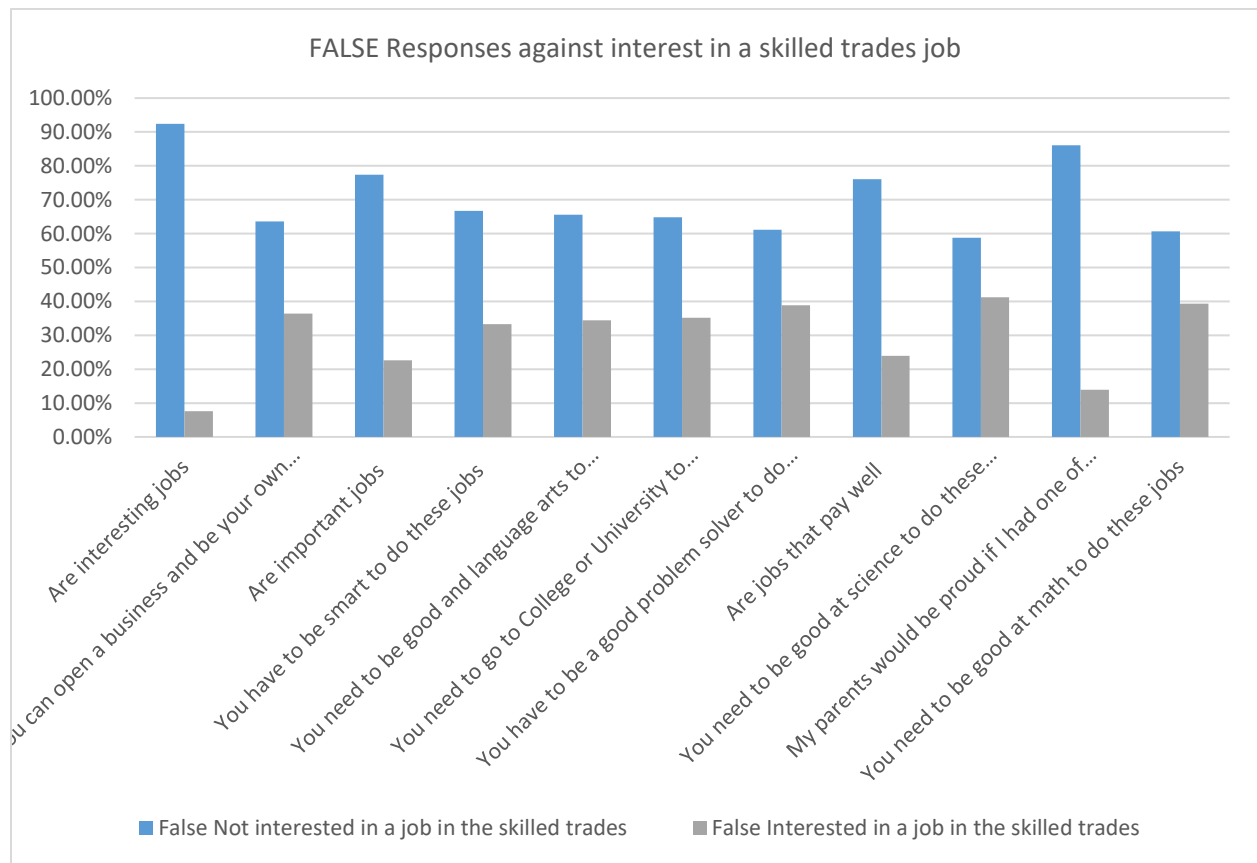
Conversely, those who were not interested in a skilled trade gave negative (FALSE) responses more often than those who were interested. This suggests that negative perceptions of skilled trades jobs do lead to lack of interest, but favorable perceptions do not necessarily lead to more interest. This is consistent with

the findings from the open-text responses to the question "*If you're not interested in a career in skilled trades, explain why not*", where 49% expressed reasons relating simply to lack of interest.

Overall, the responses were more positive than expected. For students who did provide negative (false) responses, there were stronger perceptions that one did not need to be good at language arts or science to do these jobs. For some students who shared these perceptions, they were still interested in skilled trades jobs – despite, or perhaps because of these perceptions. Inasmuch as youths' espoused interests (or lack thereof) are driven by awareness and experience, there is an opportunity to build more interest through awareness and exposure programs earlier on in students' education.

Perceptions of Career Opportunities in New Brunswick

The pervasive belief in New Brunswick is that the real or perceptual lack of opportunity in the region is the driver of out-migration of youth. This section addresses this assumption and draws out some critical insights into youths' actual perceptions of career opportunities in New Brunswick.

Do you have family or friends who live in New Brunswick but work in another province?
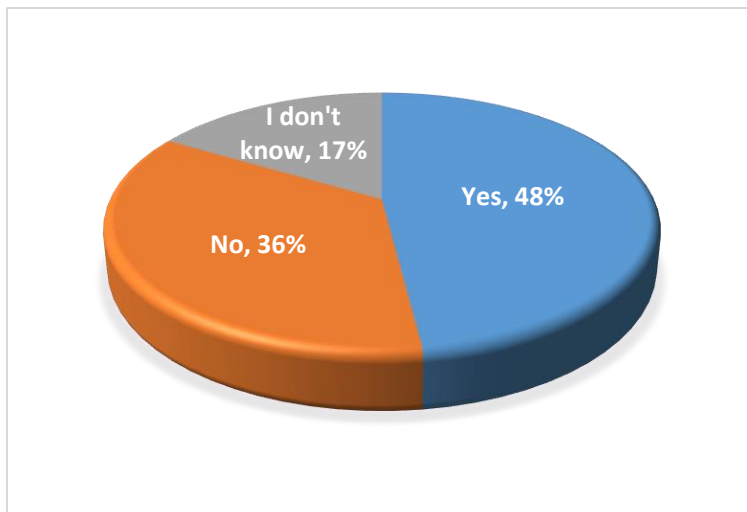
This question was posed to provide insights into the socialization and normalization of interprovincial mobility among participants. As expected, a considerable proportion (nearly half) of New Brunswick youth have proximal experience with this mobility option. Experience with the phenomenon of *leaving for work* is an important variable to understand insofar as it influences young peoples' own comfort levels or aspirations to consider the option. Familiarity helps to validate the choice of mobility and elevate it in the minds of youth to not just a reasonable option, but possibly a primary one.

Interprovincial Mobility

The driver of interprovincial mobility has historically been the absence of regional opportunity and employment coupled with myriad and lucrative opportunities in other provinces (i.e. out West). Indeed, this report has already indicated that 36% of youth have expressed an intention to leave the province after highschool to pursue work or further education. The assumption holds (anecdotally) that young people are predicting a push from the maritime region by the same economic limitations. The following group of questions challenge this assumption by solicitng young peoples' perceptions of their future employment options regionally.

Which statements do you believe are true or false about jobs in New Brunswick?

a) There are good jobs in New Brunswick;
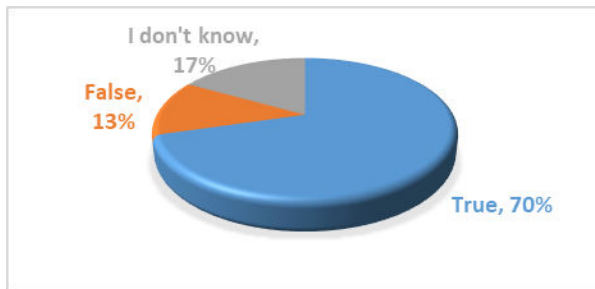
b) The best jobs are in the cities;
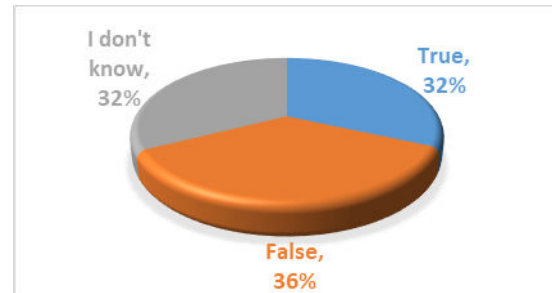
Question A reveals significant optimism among our youth regarding career opportunities in their broad (New Brunswick) and regional environments. Question B shows similar optimism, but this time for rural opportunities, suggesting that youth are equally confident in their ability to find good employment in a city, or in a more remote area. No correlation was found between gender or grade and optimism in the jobs in NB.

c) The best jobs are out west;
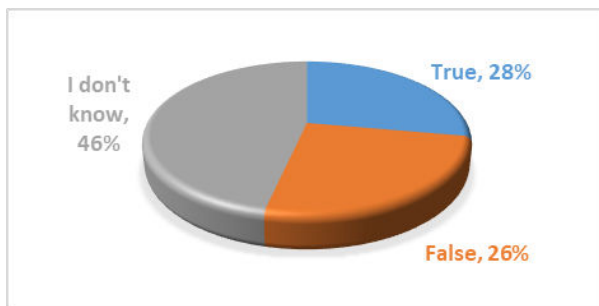
d) It will be easy to get a job when I'm older;
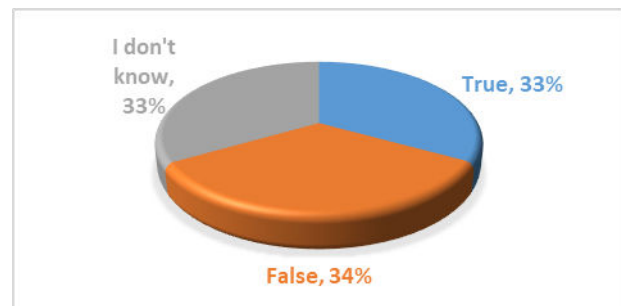
Responses to statement (c) were fairly equally divided, showing that youth in New Brunswick do not share the common regional assumption (anecdotal) that the best opportunities are to be found out west. These responses may be explained by variability in the perception of what constitutes the 'best' jobs, and may show that youth are able to evaluate some of the different aspects that comprise a good job. When this question was analyzed against the question asking *Do you have family or friends who live in New Brunswick but work in another province*, it was not shown to influence the responses (i.e. knowing someone who has been living here but working elsewhere, did not change their perceptions of the best jobs being out west).

Responses to statement (d) were slightly less optimistic. Participants seem to be communicating optimism in the availability of good jobs regionally, but lack of confidence in their future ability to take advantage of those opportunities.

e) To get a good job I will need to go to University;   f) To get a good job I will need to go to College;
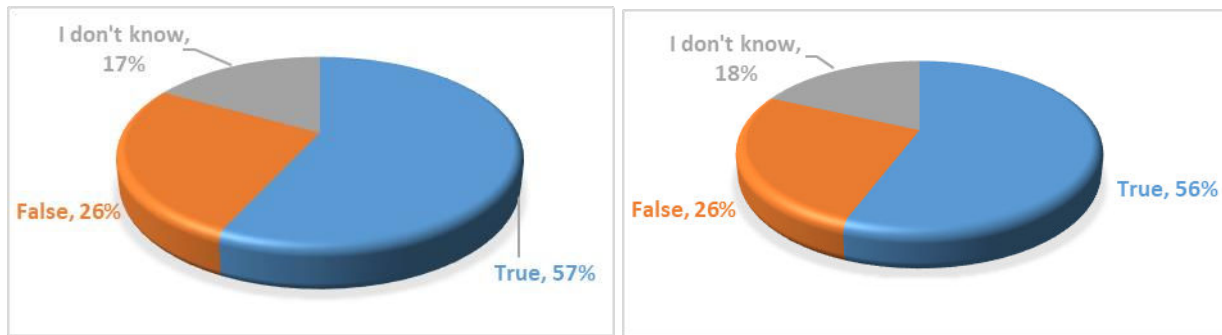
The majority of students are in agreement that post-secondary education is a prerequisite for 'good' employment, although more than 40% disagree or are uncertain. This may again be attributable to mixed perceptions of what a 'good job' is. Alternatively, it may speak to the need for more deliberate career education to help students to understand the pathways to employment.

Not surprisingly, there is significant overlap between the students who indicated that they want to follow an academic pathway (specifically University) out of highschool, with those who believe that they require this pathway to get a good job. The overlap was considerably less-significant for college education, suggesting that many students believe that community college is an available pathway to employment, but not an essential one. This reinforces the importance of developing career maturity and an awareness of the link between academic requirements and employment in certificate/diploma-credentialed careers.

g) I can get a good job without finishing high school;
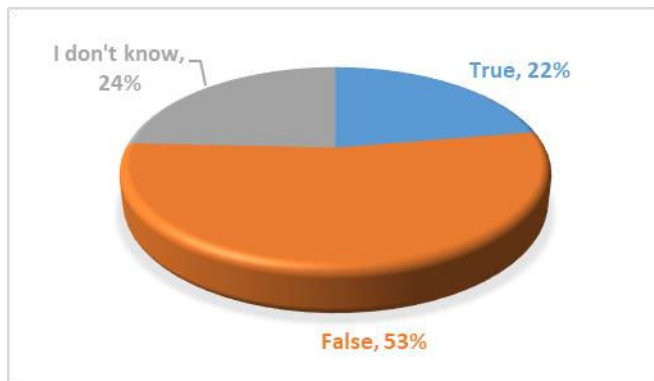
It is surprising to note that almost a quarter (22%) of students marked this question as true. When combining true and don't know responses, we see that 46% of students believe it may be possible to get a good job without finishing high school. This may be due to different perceptions of what constitutes a 'good' job. These students may have siblings who are already employed in part-time jobs that they regard as 'good'. This may indicate the importance of more education about the type of lifestyle they wish to have when they are older, and the kind of job (income) they would require to support that. Furthermore, students may not have the financial acumen to understand the link between income and lifestyle.

Responses to these true/false questions indicate that youth perceptions of career opportunities in the region are generally optimistic. However, responses do indicate some concern about the opportunities to participate in a regional labour market, as well as some confusion about the education requirements and pathways for future careers.

Career Consideration Drivers

The following question was asked three times, first asking "*When I think about my future jobs, what is important to me is* ". The following two times it asked students to consider what their parents/guardians think is important, and what their friends think is important.

The self-actualized motivation of 'having a job that I enjoy' was expressed as the primary factor for all three groups. It is not surprising that compensation (i.e. make lots of money) was ranked high by 'me' and 'my friends', as young people continue to evaluate personal and career success by compensation. Additionally, the link between financial success and independence is a widely discussed issue in the media. The third response that was ranked highest, with the most consistency between the three groups was 'have a good work-life balance'.

When I think about my future goals and careers, what do people think is important?
(All students, top five most frequent choices)

Category	My friends think	My parents think	I think
Help other people	20%	22%	23%
Have good work-life balance (time for the things I love)	25%	31%	30%
Have a job that I enjoy	48%	56%	61%
Continue my education (i.e. College or University or Apprenticeship)	19%	36%	24%
Make lots of money	47%	33%	39%

The third question that asked participants to consider what their peers regard as important functions as a projection question that helps to validate the responses of the individuals. Typically there would be more significant alignment between *the important to me* and *important to my friends responses,* which serve as a proxy for individual perceptions. The lack of perfect alignment between these two responses may indicate that youth have had conversations with their peers about their future careers and are expressing their interpretation of their friends' aspirations rather than simply mirroring them with their own.

There is consistency between the responses for the individual and beliefs of what is important to their parents, which demonstrates that young people are hearing the messages that parents communicate about value and importance. Participants also ranked the importance of tertiary education to their parents significantly higher (36%) than the other two groups, suggesting that messages about post-secondary pathways are being reinforced at home.

The statement that received the lowest response was 'get a job without needing more school' which demonstrates that youth are aware of the connection between some type of post-secondary education and career success. Other responses that received low rankings included; work outside or with nature, start my own business, and build or create things. These responses are more worrying insofar as there is much emphasis across the country in engaging youth in entrepreneurial and skilled trades careers. Additionally, as economy and ecology become more strategically intertwined and considered and emphatically oriented around sustainability, it is important to have a workforce and a citizenship that is engaged and invested in the natural world around them.

Insights and Recommendations

Narrow and dated perceptions of ocean-oriented and skilled-trades career options among youth, parents and teachers are contributing to a lack of interest and bias in these pathways, and a lack of willingness to even explore them

Youth in NB value career enjoyment, compensation, and work/life balance in their career pursuits

Entrepreneurship is not a well-socialized career pathway among youth in NB

There is a need for highly interactive career exposure programs well before grade 9 that target youth and their families

Insights & Recommendations

A key insight from this study is the general and broad lack of awareness of New Brunswick youth of marine oriented careers. Young people generally have a very narrow perception of career options in the marine industry, with awareness largely limited to traditional notions (i.e. fishing, Navy).

The data suggested that the lack of interest in marine industry careers is rooted in a broad lack of awareness of the range of available careers (i.e our youth are not sure what the 'marine industry' means beyond fishing and Navy), and in lack of positive exposure to the oceans, resulting in fear and apathy in place of stewardship and fascination. We need more oceans presence in NB provincial curriculum, and more experiential programs and teaching to reconnect young people to the oceans (and other waterways), to build engagement and curiosity, and to connect with the broad range of opportunities that are locally available. We need optional exposure and awareness programs (extracurricular), as well as mandatory ones to ensure that we are reaching young people who might not have exposure through their own social networks, or for those who have not even considered the oceans an option worth exploring. We can't rely on voluntary extracurricular programs to reach all students. These opportunities will help to ensure that even if students decide that they aren't interested in a marine-oriented career, that at least it is an informed decision.

Similarly, responses generally showed a lack of awareness of skilled trades careers or misinformed awareness, which is reported by youth as a lack of interest in these careers. There is a prevailing stigma against skilled trades pathways (i.e. prestige, approval, compensation) that students as young as grade 6 are conscious of. Additionally, students remain poorly informed about the myriad career pathways that emerge from a skilled trades credential, and about the high-tech/low-touch characteristics of many modern-day trades. More exposure and awareness programs are needed in the grades 6-9 cohort to erode the stigma and build fascination with the creative and problem solving contributions of skilled trades and technology roles.

A third key insight is that our youth form strong biases against certain careers or pathways from an early age (i.e. by grade 6). These biases are not always well-informed, but they influence and limit the options that youth consider as they progress through school and through their career exploration. Overall, youth in New Brunswick communicated strong preferences against careers in skilled trades and marine oriented careers. Open text responses revealed that these preferences against were not well-informed. This is an important insight as it demonstrates that at an early age, young people are restricting rather than expanding the range of career options within their consideration. Just at a time when they should be looking more broadly, they are disregarding certain pathways, without having a chance to actually explore them. Even more noteworthy is the finding that the rationale being employed by youth to dismiss career and education options is often based on perceptions of social prestige and value (and associated peer and parent approval), and is not necessarily based on individual talents, skills and interests. This has relevance to exposure and awareness programs that rely on voluntary participation, as young people may not be

engaging in the exploration activities they could, having already dismissed certain options. This, in turn, points to the importance of mandatory awareness programs during these early years (i.e. prior to grade 10), before education choices are made that further restrict their pathway options. Youth in New Brunswick highlighted the strong influence of parents and family members in career and education decisions. It is important that any career or ocean literacy campaign target these key influencers with correct information to facilitate more informed coaching at home. The importance of family validation of proposed options can not be over-stated. Parents in particular need to better-understand emerging industries and the career and employment prospects they present. Parents also need support in shifting and updating their own often-misinformed perceptions of 'traditional' industries and of the potential career pathways that can be enjoyed within them.

We also see evidence of the bias-forming effects of negative narration (i.e. from parents, friends, media) on perceptions and career choices. Many students expressed an intention for a specific pathway (predominantly University-oriented), however these education intentions were not always consistent with their career intentions or the intention was expressed without an outcome in mind (i.e. *I've just always known that I will go to University. I'm not sure what I will be yet but University is for sure for me* – grade 8 female). This shows a strong awareness of the prestige and social preference for University pathways, and is evidence of the academic default that many of our young people are socialized for.

This study reinforces the need for highly interactive career exposure programs well before grade 9. This recommendation is support by research[33] that suggest that students as young as 10-12 years old will benefit from career education, and that by the age of 14, the potential negative aspects of certain careers begin to take hold. The consensus in the literature is that early exposure to a wide variety of career options is important[34]. Career education needs to advocate for many options that include the 'big dream' as well as more plausible options that are linked to the individuals skills, competencies, and interests. These programs need to be interactive and socially focused –and also need to be more adjectively focused (instead of job title focused) to link to the compelling competencies and qualities of a career path (i.e. creative, problem solving, interactive, entrepreneurial, independent, etc.). And finally, we need to coach our young people on the types of skills and competencies they'd like to build to launch their career webs that can take them in numerous directions, versus coaching them towards a terminal or linear notion of career.

The data also provides insights into the most effective (i.e. trusted and accessible) modes for providing career counseling. Responses indicate that the traditional models of career counselors, guest speakers, or of one-on-one career counseling, are not trusted or valued. Today's young people value career exploration with an experiential versus informative focus. In addition to the importance of highly interactive career exposure programs well before grade 9, the data suggests that these programs need to be experienced in a social, peer education environment that utilizes technology channels.

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[33] Hartung, Porfelli, and Vondracek (2005)
[34] Carpenter, 1993; Welde et al., 2016; Zimmer-Gembeck and Mortimer, 2006

This study also gave support to the researchers' hypothesis that mobility may be in part due to a *mobility motive* (i.e. that mobility has become a motivator in itself) rather than to pessimism in local opportunities. There was some indication of concern about individuals' abilities to participate in the good career opportunities in their region, and are thus feeling pushed to other regions where opportunities are more within reach. This result represented a clear departure from the results found in previous regional studies conducted in Nova Scotia. However; similar to the previous studes, there was also a suggestion that optimistic youth are feeling pulled to other regions because mobility has become more normalized and interesting to a broader range of youth than in previous generations. It would seem that for some, the trend has shifted from *leaving because we have to – to leaving because we want to.* This has considerable implications for post-secondary recruitment programs, and for youth employment programs. A course of action may be to find ways to provide opportunities for our youth to explore their mobililty pursuits through more temporary experiences that won't ultimately lead to the shedding of our youth as they depart the k-12 system. It would be worth further exploration to better-understand what is driving the perceptions among youth that good jobs in the region exist, but that they willl be out of reach to them.

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Appendix A: Letter to Teachers

Message to Teachers

As you know we have several initiatives underway aimed at preparing our young people for tomorrow's opportunities. To ensure that we are working from the most recent and relevant data about our young people, we will be implementing a survey of students in grades 6-9 across the province of New Brunswick. The ***Student Intentions and Perceptions Survey*** will solicit responses from our young people that will provide valuable insights into their perceptions of trades, technology, and marine-oriented careers, and of their career optimism. It will also provide some insights into their mobility intentions, and the drivers that influence their career and education choices.

In order for us to provide the most effective career literacy and awareness programs, it's important that we understand what our young people believe to be true, and that we understand what interests them and why.

We are asking for your support in launching this survey. Here is what we require from you;

- Introduce the survey to your students (**brief instructions for implementation are provided below, along with the survey link**)
- Between **May16th -June 1st** provide time (~15-20 minutes) and resources (i.e. access to PC, laptop, hand-held, or other device) for each student to complete a survey independently (assistance may be provided to students with accommodations)
- The same survey link can be used several times, but each student should only complete it once
- Students will need to complete the survey in one 'go', as partially completed surveys cannot be saved

Instructions for Implementation

Before students begin, please provide the following instructions;

- Explain that this survey is asking them about their ideas and plans for their future career. Remind them that we are very interested in hearing about what <u>they</u> believe about different career options, and what they plan for themselves
- Ask them to read each question and instruction carefully, as some questions may sound the same
- Explain to students that it will likely take them 15-20 minutes to complete the survey, but they may take as much time as is reasonably needed
- Teachers may provide guidance re: clarifying questions or vocabulary, or pathway questions (i.e. *does a doctor need to go to University or College?*)

- During the pilot, the survey seemed to inspire discussion between and among students. It is fine if students discuss the questions and their choices, as this seemed to support comprehension and engagement, and did not seem to unduly influence responses
- If you have any technical challenges with the survey tool, please contact
- Provide survey link to students. This survey can be completed on a PC, laptop, or mobile device.

Survey Link:

https://www.surveymonkey.com/r/StudentIntentionsstudy

The results from this study will be made available to participating schools in the Fall of 2018. We thank you in advance for your support with this important research. If you have any questions about this study, please contact me directly.

Regards,

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Appendix B: Career Categories

Category	Examples
Medical and health professions	Doctor, surgeon, nurse, veterinarian, physiotherapist, psychiatrist, dentist, orthodontist
Visual and performing arts	Artist, actor, singer, YouTuber, musician, author, filmmaker
Professional sports and related	Professional athlete, coach of a professional team, agent for professional athletes, equipment manager
Military, police, firefighting and outdoors	Army, navy, marine corps, coast guard, police officer, firefighter, agent for Department of Natural Resources, forestry, logging, game warden
Retail or non-professional	Personal trainer, book publisher, waiter, pilot, flight attendant, cashier, anonymous buyer, snowmobile retail, car painter, truck driver
STEM careers	Scientist, engineer, marine biologist, computer programmer, technologist, architect
Trades	Mechanic, carpenter, electrician, welder, construction, chef, baker, hairdresser, makeup artist
Non-STEM professionals	Lawyer, banker, politician
Business owner, small business owner	Restaurant, mechanic, beauty salon, trades, bakery, retail