The Current State of Gender-based Diversity within the Field of Canadian Professional Structural Timber Engineering

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Abstract

There is currently minimal data that may be used for retention and recruitment strategies for timber professional engineering in Canada. A comprehensive survey performed in 2022 to address this lack of data is discussed. The survey was generated and analyzed by York University (Canada) and distributed through the Canadian Wood Council's membership directory. This survey explored participants' motivations for working on timber-based structural projects and the existing state of EDI training within the workspace. Findings from the context of analysis illustrated that retention in the work force appears not to be affected by gender, with participants overwhelmingly indicating their plan is to continue to work in the timber structural engineering sector. Gender specific findings suggest that most men who practice timber structural design have had more recorded work experience, whereas women were more likely to obtain a PhD when pursuing graduate school.

Key words: Timber, EDI, gender studies, design, engineering education

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1.0 Introduction

With the motivation moving towards more sustainable building infrastructures identified in the Conference of the Parties 26, there has been a global influx of demand for timber structures, and this has been pronounced in Canada (Philion et al., 2022). In Canada alone, the number of engineered designed timber structures (see an example in Figure 1) increases annually with the advancement and creation of manufacturing technologies. Natural Resources Canada maintains data on mass timber construction projects occurring in Canada, indicating increases in mass timber construction from 2007 to 2018 (National Resources Canada, 2022). Large-scale fire tests have increased the confidence of building authorities (Kotsovinos, 2022; Kotsovinos et al., 2022) which have led to novel code changes that are being rapidly developed and refined to provide greater guidance and more certainty in safety for mid- and high-rise construction (Canadian Commission on Building and Fire Codes, 2022). To complement this momentum, (Daneshvar et al., 2021) conducted surveys to determine the state of timber education in Canadian Civil Engineering programs. Results of these surveys indicate that there is growing interest by students to participate in courses which incorporate timber design and relevant demand from industry that they have these skillsets entering the workforce.

Figure 1. Selected Mass Timber building in the Greater Toronto Area (GTA) (author's photo)

To support novel timber structures, increased efforts to retain and attract an engineering workforce is essential. A sound equity, diversity and inclusivity (EDI – also seen phrased as DEI) plan is typically part of this strategy and can contribute towards having a large pool of candidates. This begins from the educational sector and extends to practice. A collaborative and supportive environment which recognizes and mitigates potential career barriers was found to ensure high retention as discussed in a previous industrial survey of engineers across Canada (Mazur et al., 2019a). These barriers typically involve those that may impact one's career beginning and progress. Some of which are related specifically to gender (among other EDI considerations), which the authors describe below.

It should be acknowledged that while there are more genders than just man and woman, this study will focus primarily on men and women. This is because the study consists of a survey which examines the state of gender diversity and inclusion with the field of timber engineering. Within the survey, a multitude of genders were made available for selection (see Supplemental B) however only the man and woman choices were used by participants. It should be noted that three participants chose to not identify a gender and were consequently removed from further analysis. As this study primarily looks at gender diversity, analysis of these responses would not provide a better understanding of what unique experiences may be taking place across genders. These three participants did not provide a reason as to why they chose not to identify. For this reason, the literature review and discussion of data will only focus on the genders of man and woman. Additionally, the use of terms regarding sex and gender which occur within the following section are the ones which were used in the referenced material.

2.0 Background

When examining diversity in terms of gender in the work force, there is a lack of available data. However, in terms of sex, it has been documented that 17.9% of newly licensed engineers identified as female and 25.2% of engineering students identified as female in Canada (Engineers Canada, 2020). It should be noted that these statistics are taken from four years into a 15-year initiative, titled 30 by 30, in which the goal is to increase the percentage of newly licensed engineers who identify as females to 30% by 2030 (Engineers Canada, n.d.). For reference, prior to the start of this program (2014), only 17.0% of newly licensed engineers identified as females (Engineers Canada, 2015).

To benefit these movements, there are several groups which work to address this problem. One of which is a consortium named Engendering Success in STEM. Engendering Success is a collaboration of several universities and STEM-based associations and companies which seek to reduce barriers faced by girls and women from childhood through to university and early career (Engendering Success in STEM, 2023). Some focuses of Engendering Success are the effects of biases and a person's fit in an environment (Engendering Success in STEM, 2022). The idea of fitting in an environment such as STEM can be seen to have three main categories: self concept, goals, and social. Self-concept fitting relates to one being able to be their authentic self in an environment, a goal fit is about if a person's career goals align with an environment, and finally social fit is about one integrating with the environment (Engendering Success in STEM, 2022). Once these aspects of fit are affected, such as the default use of masculine phrasing or removing an emphasis on collaborative work, people may begin to self-segregate without there being explicit bias occurring (Engendering Success in STEM, 2022).

The concept of fit in an environment is not a foreign idea. From a psychology viewpoint, it has long been understood that feeling a sense of belonging or acceptance (self concept and social fit) are important to a person's health (Dasgupta and Stout, 2014). (Dasgupta and Stout, 2014) identified several barriers which women face in the STEM fields in their careers (from

higher education to established careers). Many of these barriers are in some way related to a lack of fit experienced by women. Through higher education in STEM, common barriers for women include being outnumbered by men and a lack of same-sex role models.

Within the workforce, it is recognized that a mentor is beneficial. (Saffie-Robertson, 2020) examined the state of mentorship for women in STEM-based careers through a series of interviews with women in the field. One key finding of the interviews was that when the interviewees were asked to think of any barriers to finding a mentor in their work, none stated issues with accessing a mentor. However, the interviewers did indicate barriers to developing the mentorship relationship. The primary barrier, stated by 75% of respondents, was that there needs to be a fit in the relationship (Saffie-Robertson, 2020). In the context of the interviews, a need for fit related to sharing similar values with the mentor or a personal connection. Additionally, the example quote provided for when an interviewee explained the need for a personal connection was “And for me a mentor is even a step beyond that. You know it’s someone that you build that emotional connection with, that you can share a life view, you probably have similar points of view about things that are important to you.” (Saffie-Robertson, 2020) Another part of the interview was to ask the participants if they had a formal mentor at work and, if so, was it a positive, negative, or mixed experience. Of the 36 interviews, 15 had a formal mentor at work. Eight of these 15 had a negative experience and a further four had a mixed experience. These statistics are expected as a formal mentor in the context of (Saffie-Robertson, 2020) is a sanctioned mentor based on matching the sharing of organizational knowledge and progressing a protégé’s career. This method of developing a mentor relationship leaves the idea of fit to chance as opposed to naturally developing a mentor relationship.

In professional life, (Dasgupta and Stout, 2014) indicate that a department climate and work-family balance are common barriers faced by women. Department climate is the sense of social fit within a company department and is often found to be lacking in STEM based departments (Dasgupta and Stout, 2014; National Research Council, 2009). As stated in (Engendering Success in STEM, 2022), once the sense of fit is lacking, people may begin to self-segregate.

When examining the educational sector, a study performed at the University of California, Berkeley has acknowledged a low enrollment of females in engineering (Oehlberg et al., 2010). In 2008, they introduced an undergraduate course which addresses challenges in sustainability. One goal of this course was to introduce an inviting environment for minority students in terms of gender and ethnicity. At the beginning of this course, students were asked to fill out a survey to understand what STEM experiences they had during high school. From this survey, it was found that while more male students took a shop or design course than the female students, it was more female students who participated in extracurriculars related to engineering and participated in design competitions (Oehlberg et al., 2010).

The phenomena described forms a practice trend titled the 'leaky pipeline'. In brief, the pipeline is the flow from a beginning (education in engineering) to an end (distinguished career in engineering) where some of those in the flow leak out and are left behind to no longer pursue engineering (Clark Blickenstaff, 2005). In the cases described above, it would be students making their way through engineering school and at key points, there are large drop offs in female enrollment and/or continuation into the field or further studies. While this model can be used to aid in identifying what issues exist throughout a person's career, this model has been criticized as even if all the "leaks are patched", nothing has addressed that the students are not treated equally and that there is more than one distinct "flow" in the pipeline (Aiston, 2016). A model that has been developed to address the different environment faced by females and males is the "Chilly Climate". This model came to be when it was noticed that female engineering students would describe the learning environment as "chilly and inhospitable to women" (Clark Blickenstaff, 2005; Sandler et al., 1996). Examples of causes of the chilly climate include mentor figures who push female students away from continuing education and family members may push female students away from engineering (de Pillis and de Pillis, 2008). A more recent study by (Mazur et al., 2019b) identified numerous barriers in the form of colleague-to-colleague discouragement at various universities which affects retention of female students.

A factor which has been shown to aid students in completing their education and remaining in the field of engineering is for them to self-identify as an engineer. (Meyers et al., 2012) surveyed the undergraduate engineering students at an American Midwestern school about what they feel defines engineering. Within the survey, the participants were asked if they identified as engineers. At all class levels, it was found that male students were more likely than female students to identify as engineers. (Meyers et al., 2012) did conclude that more studies are required as cultures and experiences of students can vary, and one survey may not represent the norm. In contrast to (Meyers et al., 2012), (Hamlet et al., 2021) found that in upper years, female engineering students were more likely to self-identify as an engineer as opposed to a male student. It should be noted that (Hamlet et al., 2021) believe that the language used in the survey may influence these results. However, it was also noted that (Chachra et al., 2008) used the same framework but surveyed lower year students and found that there was no statistical difference between the proportion of male and female students who identified as engineers. This potentially indicates that upper year female students are more likely to have formed an engineering identity.

These issues noted are not unique to education and academia. The workforce has also seen an imbalance of genders taking STEM roles. In 2018, a report was published by the National Sciences and Engineering Research Council of Canada (NSERC), authored by the then Chairs of Women in Science and Engineering, and detailed a summary of the distribution of males and females in various STEM fields in Canada (Perreault et al., 2018). In this report, it was found that from 2006–2016, there was never more than 30% of the workforce being women, with the peak of 20.05% occurring in 2015 (Perreault et al., 2018). In this report, STEM fields were composed

of Agriculture, Biology, Engineering, General Science, and Math/Computer Science. Examining each of these fields individually, the field of engineering had the lowest representation of women practitioners. In 2006, 12.47% of those practicing in the field of engineering identified as women, a percentage that increased to only 17.07% by 2016 (Perreault et al., 2018).

This study herein aims to understand the current state of gender-based diversity within the field of timber professional structural engineering. Data collected in this study consists of age, race, gender, and motivators for working in the industry. This baseline data of the field will allow for the creation for future studies which can target research needs in EDI with quantitative evidence for its need. Additionally, this data may be used for developing diversity strategies that focus on gender retention and recruitment within the timber (and even general) engineering practice. It is one of many engineering educational projects underway. Canada has rapidly mobilized research and attention into this area. The topic of engineering education in general has grown in Canada the last decade. Previous focus has paid attention to curriculum enhancements (Boton, 2018; Quiquero et al., 2018), graduate attribute enhancement (Easa, 2013), university-industry development (Daoud et al., 2017) or now more specifically EDI. As of 2020, nearly 16% of Canadian engineering education studies, seen at the annual Canadian Engineering Education Association conference series, were on the topic of EDI in engineering education (Martins-Robalino et al., 2022).

3.0 Methodology

Herein, a comprehensive survey performed in 2022 is discussed. The survey was generated and analyzed by York University researchers (the authors) and distributed through Canadian Wood Council's membership directory. The membership directory consisted of engineering companies across Canada who have worked on timber structural design projects. This survey examines how individuals in these organizations were motivated to perform timber structural design (i.e., Structural engineering which involves the use of wood-based load-bearing elements), and whether certain factors can be used to attract and retain future timber engineers. The survey inquires into the respondents past experiences in timber structural engineering, both through their education and their career, as well as whether they see themselves remaining in the field. The survey explores the existing state of EDI training within the workspace and areas where it may be improved upon.

Participants to the survey numbered over 132 with most identifying themselves as practicing engineers in Canada and nearly all having at least an engineering undergraduate degree. Findings are analyzed based on self-identified gender by the respondents (examples being man/woman). A list of recommendations and future research follows. This discussion is to provide how certain educational strategies can be used to attract future timber engineers and retain those currently practicing in timber engineering to continue the momentum of its growth and demand in the Canadian building sector. Additionally, the results of this study may be able

to suggest that including timber education within engineering programs will encourage females and marginalized populations to pursue engineering.

The survey was generated with thirty questions to meet the research aims of the study. The survey follows the informed consent form in *Supplemental A* as presented to the respondents. The survey questions in their entirety are presented in *Supplemental B* which follows the manuscript. In general, the questions follow the language used by NSERC when asking for demographic or company specific information. The design of the survey questions drew motivation from a previous published and peer-reviewed study pertaining to gender and retention in engineering (Mazur et al., 2019a; Mazur et al., 2019b). The questions which were developed are exploratory in nature as, to the authors' knowledge, at the time of writing there were no peer-reviewed studies which examined the gender diversity within the field of timber structural engineering. Deviations in language are also adopted from the internal ethics process or databases of information being held by the Canadian Wood Council. The first three questions examine the demographics of the respondents. Questions 4 and 5 consider the licensure status and highest educational degree attained. Question 6 regards family background. Questions 7 to 10 categorizes previous timber education and related motivations. Questions 11 to 16 gauges the experience level the individual has with timber design in general. Questions 17 to 21 investigate the motivation to continue practicing in the timber design domain. Questions 22 and on were considered optional. These were optional as there was potential that the respondents could be identified with the information they may provide. These questions investigated the region and company information. Here, more pointed questions pertaining to EDI were presented which consider the degree of training received (i.e., did the training address barriers which we describe in Section 2 for example). Questions were tailored to allow the study of linkages and correlations between the industry and EDI and to allow follow up analyses of the work. In the event where respondents classify 'other' in their answers, detailed feedback is requested for clarification. It is acknowledged that not all data would or could be used immediately, however, the data is useful for future survey planning and associated non-gender specific EDI studies.

Once the survey was built, it underwent an ethics review. As the survey would make use of the membership database of the Canadian Wood Council and their social media connections via LinkedIn, it required internal clearance first and a subsequent letter affirming the organization role in dissemination of the survey. The Canadian Wood Council reviewed the survey and provided feedback to include the addition of project specific information not directly related to EDI but to gauge the practice in general in Canada. This information would be for future studies and was beyond this paper's scope. The informed consent form, survey and release protocol were submitted and then approved by the York University ethics board under certificate e2022-219. The ethics protocol specified the timing the survey could be considered open and alteration of some of the language being used in the questions being asked. It should be acknowledged that ethical procedures at universities (and industry) are becoming more and more specific in protocol and language in passing years, and more specifically acknowledged that they are traditionally

grounded in fields outside of engineering and may not fully have the requisite expertise to ensure that the surveys are of the most stringent consideration for the safety of the responder. Subsequently, there is caution that this survey herein may have been further altered had it been processed at a different institution with similar procedural conditions.

The survey was hosted on the Microsoft Forms platform and participants were able to complete the survey through a device which can connect to any web browser and internet (i.e. personal computer or smartphone). Participants were not required to answer all questions (i.e., some questions had optional components, and other questions allowed participants to indicate that they preferred not to answer). Several questions allowed them to expand upon their selected answers from the previous questions. Once participants accessed the link sent or shared to them from the Canadian Wood Council, they would be shown the informed consent form. If they consented to partaking in the survey, they would then be allowed to access the survey questions. If the participant declined to consent their participation, the survey would close. At any time, a participant could change their consent, and opt-out of the survey. Responses were not logged until the participant submitted at the end of the survey. Therefore, surveys where people did not complete were not part of the final data. The survey length and this aspect may have affected the overall data obtained however the authors felt complete datasets were essential as opposed to partial ones where linkages between questions may not have been possible or practical.

Participants were recruited by an email and social media invitation via LinkedIn from the Canadian Wood Council. Participants were given 35 days to complete the survey from the first email. Reminder emails were sent out twice (evenly distributed) throughout the 35 days. The survey itself had no time-limit for questions. All participants received identical surveys. Figure 2 illustrates the social media and subsequent interaction as of the time of writing.

The survey was distributed via the Canadian Wood Council LinkedIn profile and among those who classified themselves as members of the Canadian Wood Council. The membership extends beyond only engineers including architects, trades etc., as these groups are still closely connected to timber structural engineering. This approach also allowed the survey to be distributed outside the membership list. There is no definitive total number of people who may have been contacted available. The survey was open for 35 days. In total, the survey had 132 respondents, including one respondent who indicated they did not wish to partake by declining to consent. An average time of 12 minutes 46 seconds was taken to complete the 30-question survey. No respondents were removed from the data which was ultimately extracted as a spreadsheet in sequence of respondents answering the survey (unsorted) for the manual analysis by the authors. While it is acknowledged that there is an appearance of a low participation rate relative to the potential number of structural engineers, those participating fully completed the survey giving nearly 4000 pieces of data to analyze. The authors acknowledge that the length of the survey may have impacted the participation number. Future studies can be more refined to

focus on specific themes with fewer questions and higher participation rate. However, the approach used herein allows the authors to expand their research beyond just the diversity of gender, which is the focus of this particular paper, in future work.

Figure 2. Survey Recruitment (Reprinted with permission from Canadian Wood Council. original posting can be found here: https://www.linkedin.com/posts/canadian-wood-council_e2022-engineering-research-activity-6963515425125003265-thTM/ .)

4.0 Survey Results and Discussion

The analysis is split into two themes, first a generalized overview of the survey results to provide a brief analysis of context of the participants and then followed by gender specific results. There were no other groups who identified themselves specifically by other genders, and therefore study of gender other than men and women is beyond the scope of this paper. The analysis of context results will provide a baseline of the diversity landscape of the industry. From this, the gender-specific findings can be presented with context of the industry as a whole.

4.1 Analysis of Context

The following results describe the general landscape (age, gender, race distributions) of the field of timber structural professional engineering. Additionally, results will describe the level of education and experience of all those who responded to the survey. By outlining the results without a focus on results based on gender, this provide a baseline to which the gender specific results can be compared to.

4.1.1 Demographic of Respondents

Of the 132 persons who participated, the population group most selected was White, with 67% (n=92) fully or partially identifying with this group. Figure 3 illustrates the identified population background responding to the survey. While beyond the scope to study different barriers of racialized groups, it is acknowledged that future research should consider this topic. Specific classifications of racialized groups follow NSERC classification.

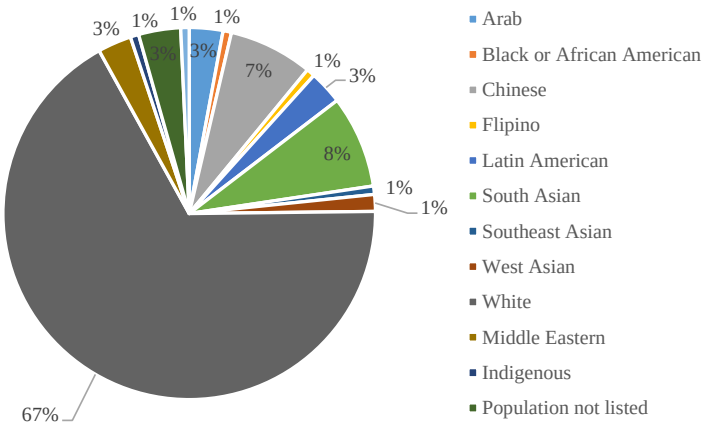

Figure 3. Population Identification of Respondents

16% (n=21) identified themselves as a woman, 2.3% (n=3) chose not to identify themselves, the remainder identified themselves as a man. Most respondents fall within the middle (30 to 49 years old, (n=67, 51%)) to late (50 to 65+ years old, (n=51, 38.6%)) age groups. Only one participant was aged under 24 years old (n=1, 0.75%). Figure 4 provides a breakdown of ages and genders selected by the respondents. The age distribution was reflected in the engineering license status, with the majority (n = 110, 84%) being fully licensed, and only 11.5% being Engineers in Training (n=6) or not licensed (n=9). The remaining 4.5% have Limited Licenses (n=4) or Provisional Licenses (n=2).

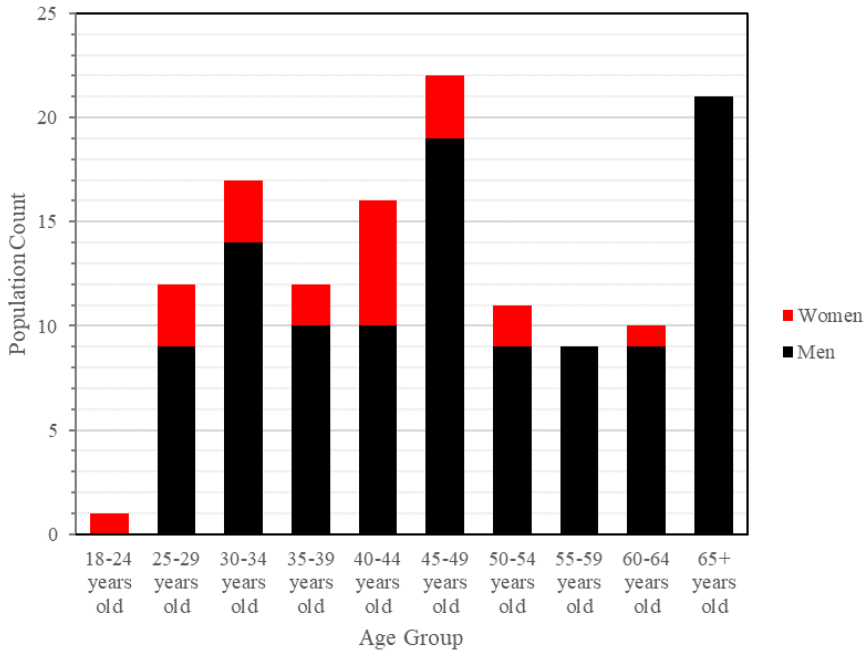

Figure 4. Age of Respondents

4.1.2 Experience and Education of Respondents

The type of experience the respondents (Figure 5) have could provide an indication of the availability of structural timber education. This may identify a need for the university education system to keep up with industry trends, which could assist in recruiting people entering the field as opposed to converting people who are already practicing. Where one finds the motivation to study timber structural engineering gives information regarding recruitment into the field (Figure 6). In this case, there is a correlation that most practitioners are learning by performing work projects and extracting motivation to continue from that. While many do indicate university experiences, this is not the principal motivation noted in the survey for continuing work in this area; work projects begin to dominate this as was indicated in the survey. This disconnect of university and industry is known. (May and Strong, 2011) outline how graduate students feel equipped for industry, where as the industry finds new graduates underprepared. As these disconnects exist and may underscore need for the university education system to keep pace with industry demands, it is reasonable to see as to why the majority of participants indicate their primary experience with timber engineering came from industry and not studies.

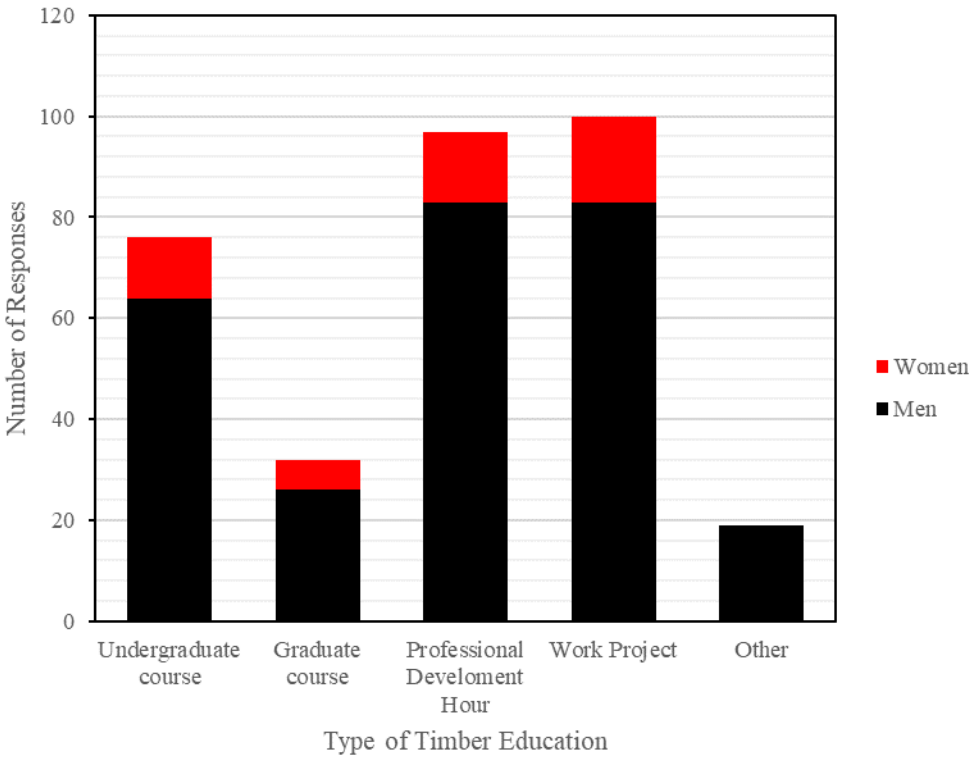

Figure 5. Timber Educational Experience of Respondents

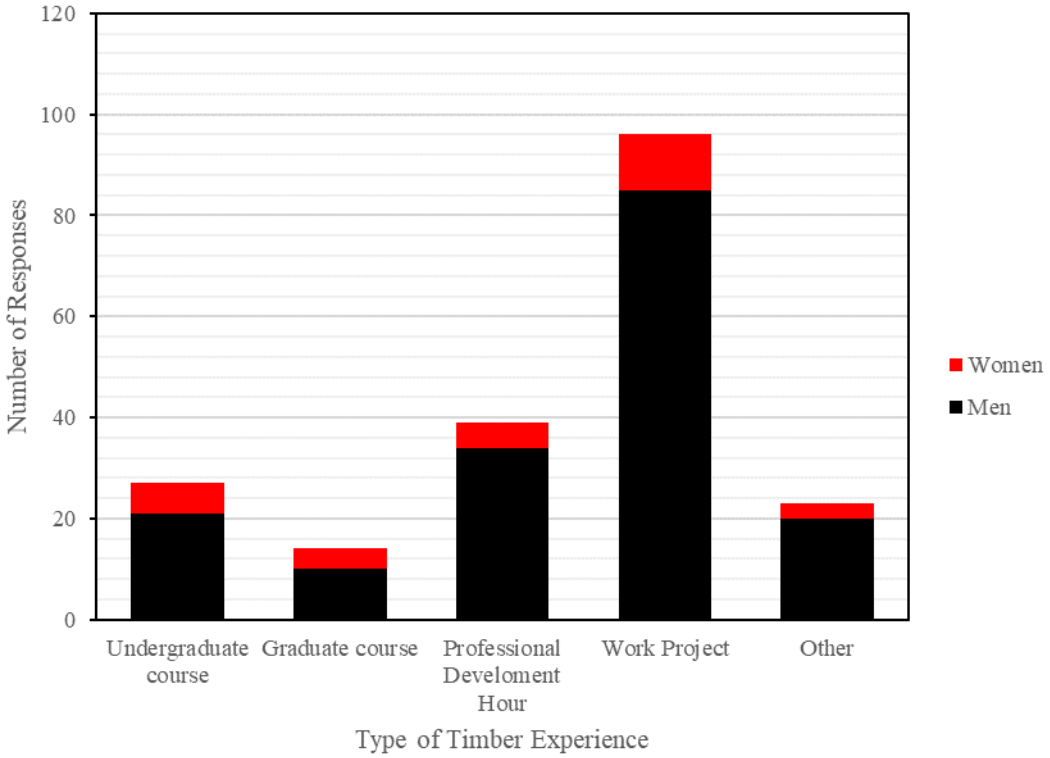

Figure 6. Source of Experiential Motivation to pursue Timber-based design

The participants identified that the timber products they have most commonly encountered were light-frame, trusses, and glulam (Figure 7). 128 respondents (96.9%) identified as working on low-rise (< 6 storeys) construction, 33 (25%) on mid-rise (6-10 storeys), and 12 (9.1%) on high-rise (10+ storeys). The majority of the current projects rely on the existing design skillsets being identified. As code provisions change however, more high-rise design opportunities may exist which consequently may increase the need for engineered floor designs, either of Cross Laminated Timber (CLT) or of a proprietary configuration requiring greater understanding of the mechanics involved as seen in many proposed hybrid systems. Current designs are commonly accessible and practical to communicate within a design module for training. Correlating to challenges in access to education, it is observed that only 52 participants (39.4%) indicated that they designed with Cross Laminated Timber. CLT is becoming more commonplace but does contain more complexity in design which makes it less effective in training all factors (Figure 7). Practicing engineers need access to education focusing on emerging structural systems.

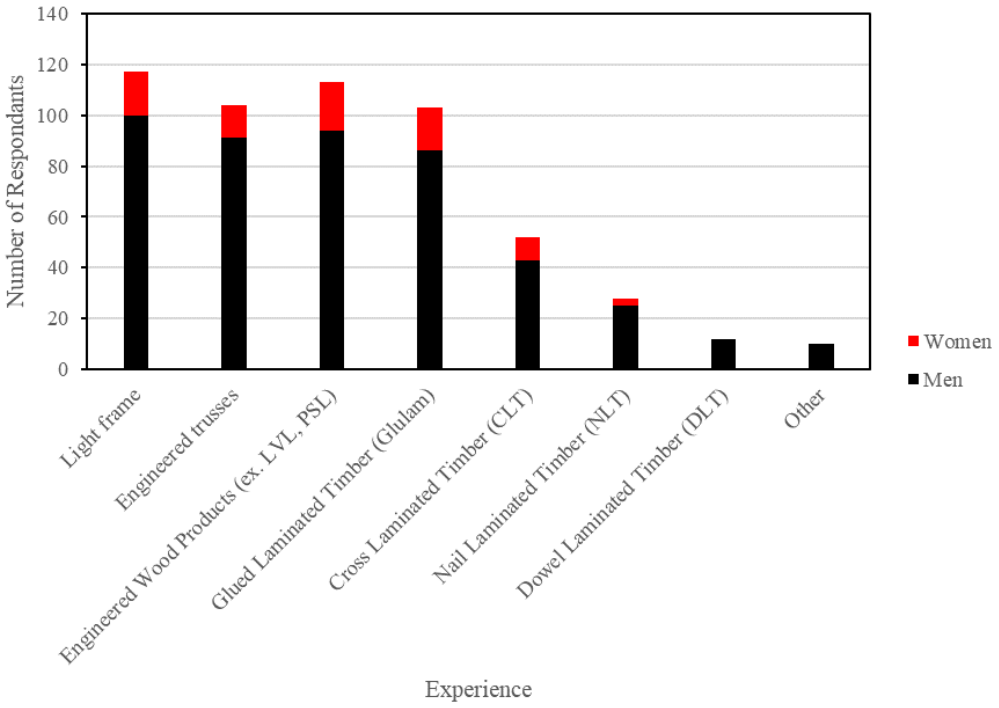

Figure 7. Type of Experience of Respondents

In all genders represented in this study, there was only one individual who indicated that they would not continue working in the timber design field which gives a positive indication to retention not currently being an issue in timber engineering based on the data. This may set a very important precedent that timber-based design work has potential for high retention in engineering practice. Of the respondents' personal motivations (see Figure 8), it is observed that sustainability is a high driver for the practitioner in undertaking timber. Sustainable engineering has been identified as being more greatly valued by women than by men (McCormick et al.,

2015), and this could tie into potential recruitment strategies. By understanding the motivators and goals that are present in people pursuing timber professional engineering, the industry can push these motivators and promote a fit for peoples' goals.

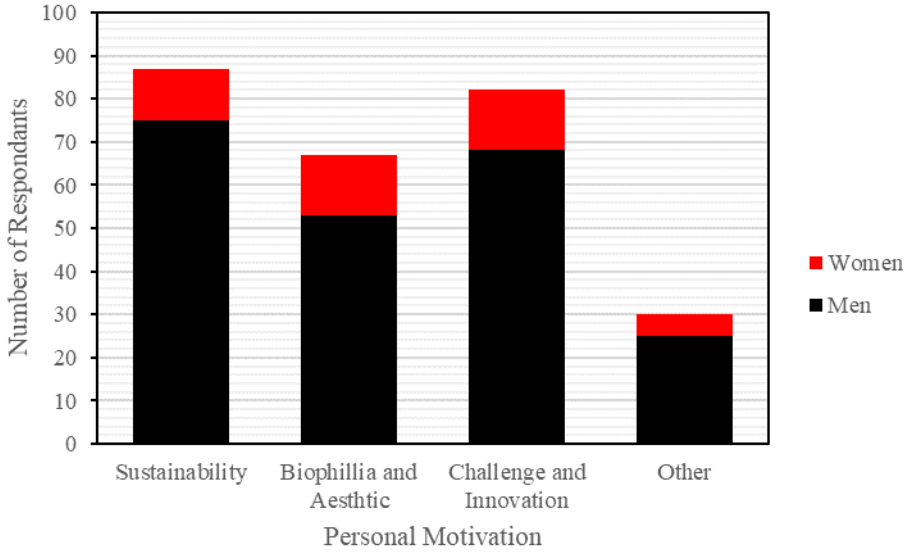

Figure 8. Personal Motivation to undertake Timber by Respondents

While not all participants responded to the optional questions, a majority did choose to respond to these questions in some capacity. Many of the participants stated they worked at companies/organizations that are considered small, with less than 20 employees (46.9%, n=60). Medium (20-99 employees) and large (100-500+ employees) companies represented almost equal shares (with 21.9%, n = 28, and 25%, n = 32 respectfully). Company size differentiation was determined following the Canadian Wood Council's classification. It is acknowledged that these may differ in other organization classification. It should be noted that there is the possibility that multiple individuals work within the same companies/organizations.

Experience with EDI training was similar between men and women, though training did correlate to the size of the company. Of the women who responded, 38% (n=8) indicated that they received EDI training with the majority indicating that it covered discussion on barriers in practice. 75% (n=6) of those who received training indicated that they worked in a medium to large firm. This is in line with studies that have shown that the size of the organization can affect its ability to commit to EDI initiatives, for example larger organizations in some sectors being more likely to have working groups focused on the topic (Lasby, 2023)

For men, 36% (n=39) indicated that they received EDI training with the majority indicating that it covered barriers in practice. 67% (n=27) of those who received training indicated that they worked in a medium to large firm. Of those working for small firms, only 20% (n=12) received training. The types of training received were detailed by 17 respondents. Seven responses detailed EDI training pertaining to the removal of barriers and unconscious bias training. Other

responses detailed training which involved disabilities, empowering staff, and how to be an effective leader. About half of the responses detailed that training was sourced from exterior programs to their companies. Because only the topic of training was revealed in this question, it is difficult to gauge the effectiveness of the programs companies were offering to the respondents though one individual responded that they did not remember the training type. Additional questions which examined the effectiveness of the training were not asked. At this stage, the purpose of the study was to gain insight into where additional research should be allocated. Furthermore, the survey was already lengthy and additional questions would have potentially deterred participants from responding.

It should also be noted that while it is promising to see organizations attempt to educate their employees on these topics, the training alone is not always effective at making change. (Kalev et al., 2006) noted that there also needs to be organizational responsibility to ensure change is being made. Further to this point, (Kalev et al., 2006) found that diversity training on its own typically has minimal impact in leading to minorities (Non-white or non-men) reaching management level positions.

Of the respondents, 27 provided written details to the question “Do you have any additional feedback you would like to add regarding wood in the design and construction industry?”. Feedback primarily focused on improving education and material knowledge. Specific focus was on considering the creation of structural timber courses with an emphasis on making these mandatory as part of a program’s accreditation (n=5, 3.8% of total participants). Related to these comments, it was remarked (n=5, 3.8% of total participants) that there is the need for the creation of materials for practitioners to learn how to design engineered timber for their projects.

4.2 Gender Specific Results

With a baseline of the education and experience of the industry as a whole, there is now data to compare the gender specific results to. Educational and work experience showed differences which suggest when women pursue graduate studies, they were more likely to complete a PhD when compared to men. This is in line with data recorded by Statistics Canada (Bonikowska et al. 2022), that there has been a notable rise in women’s participating in doctoral program, however, is a greater representation of women than seen on average across all engineering doctoral students at 27% (Rodrigues, 2021). Of the 21 respondents who identified as a woman, 61% (n = 13) indicated that they had only a bachelor’s education, 28% (n = 6) had a master’s and 10% (n = 2) had a PhD. 19% (n = 2) indicated that they did not have licensure at the moment. With respect to the same data sets by those identifying as a man, 52% (n = 57) indicated that they had a bachelor’s education, 41% (n = 44) had a master’s and 3% (n = 3) had a PhD. 13% (n = 7) indicated that they did not have licensure at the moment. Figure 9 displays the highest level of education of participants. Of those practicing, men had on average 16 years of experience with timber design and women 11 years.

Proportionally, the women answering the survey were younger than the men as shown in Figure 4. As noted by (Engendering Success in STEM, 2022), it is important for there to be mentors in which junior employees can relate to exist for retention. Therefore, to help encourage junior engineers who identify as a woman to stay in the industry, attention should be paid to why there are not many mid- to late-career women engineers in the field. This is not to say that people only relate to those of the same gender, however the choice should exist. It is unlikely that women engineers are leaving the field of timber professional engineering by mid-career as both men and women indicated similar levels of enjoyment of their career. Both the men and the women indicated similar satisfaction averaging scores out of five as 4.14+/-0.79 for the women, to 4.22 +/- 0.89 for the men. Enjoyment of wood design scored nearly identical. In combination with the fact that only one participant of the survey indicated not remaining in the field, these values are strong indications of the timber engineering field having a high retention aspect of engineers.

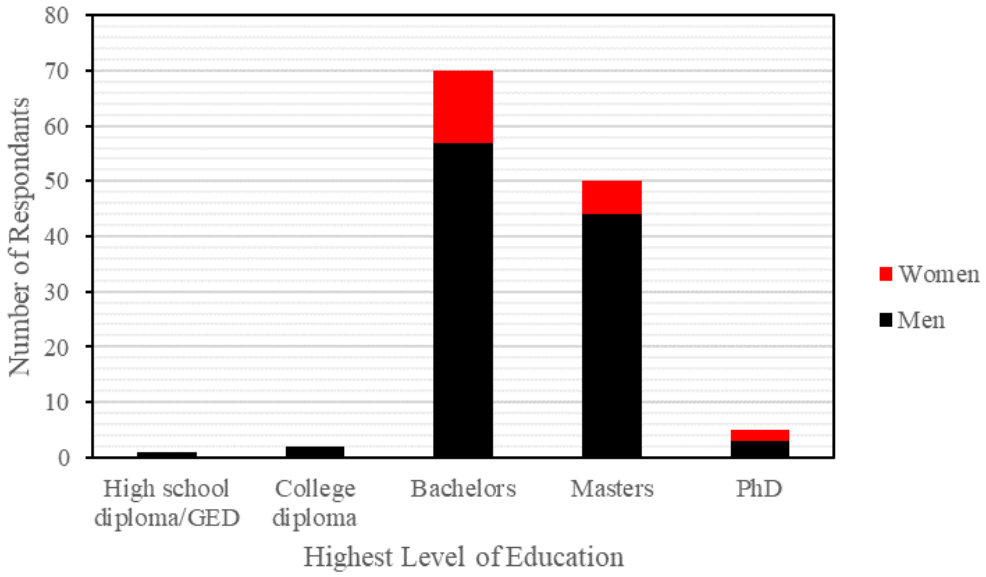

Figure 9. Highest level of education of participants

In reference to Figure 5, men and women were consistent in terms of their education type despite the women having an overall lower sample size. However, there was evidence in Figure 6 that the women would draw more motivation from undergraduate and graduate courses than the men by nearly 10% in both categories. In addition, the women were proportionally less than the men to draw motivation to pursue timber design from work projects at 76% (men) opposed to 52% (women). In reference to Figure 7, there was no large difference between the work experience type by proportion. In reference to Figure 8, 66% of the women who responded cited biophilia as personal motivation as opposed to the 47% of men who responded. In sustainability, the men were found to have personal motivation towards this at 67% as opposed to 57% of the women. There was a large portion of choosing 'other' which predominately focused on responses indicating economic and profit making as motivation. Both men and women were proportionally

close to this selection. The women were also found to be more motivated by the challenge of design than the men at 67% as opposed to 61% respectively. These differences have usefulness in drawing recruitment and retention strategies in both the industry and academic sectors where plans are created. The results of this survey indicate that each gender considered may have stronger preferences and motivators. This information can be valuable in drawing up recruitment and retention strategies in both the industry and academic sectors where plans are made. An example being that if people are only encouraged to work with timber during their careers with the motivation focusing on sustainability benefits rather than biophilia, there is the potential to attract more men than women. However, further studies into people's motivators for working with timber are needed before strategies can be formed based on this knowledge.

5.0 Future Research and Limitations

The following is a list of future research areas and limitations the research experienced. The presentation of these areas is not sequenced in priority.

The research herein did not consider demographic analysis in detail, particularly the cultural background of the respondents. Due in part to ethical considerations relating to confidentiality and approval process, this was not studied beyond a category of respondents but certainly worthy of consideration in an EDI perspective particularly that the majority of those working identified as white. An intersectional approach was not taken in considering results as the majority of the respondents came from the same categories. There would be difficulties in maintaining anonymity and confidentiality. In addition, as the majority of participants identified as male and white, an analysis on the intersection of gender and race would result in categories with too few participants to make legitimate conclusions. An example being only one participant identified as a woman and Arab. From the participants of this survey, there was not enough data to perform an in-depth analysis for intersection of what people identify as. Further studies should consider intersectionality.

The survey should be expanded to include other engineering disciplines (others in civil, mechanical, electrical, chemical, software etc.) beyond the subject matter of only timber to assess if observations are timber specific or generalized across the Canadian engineering community (and for that matter, internationally).

Opening the survey longer, while not permissible for this study, would allow more data to be collected. Though observations could be found meaningful with the data obtained, the limited time however prevented more robust statistical analysis due to the lack of data.

The survey release and content were determined through its ethics protocol. As mentioned previously, this study was to identify the diversity landscape of the field of timber professional engineering. This would then identify needs for future studies/surveys which could have more direct questions that help identify barriers in the field which are preventing equality

in the field. While care would still need to be taken to ensure surveys to not pose a significant risk to participants, this study provides justification for future studies requiring such questions.

Overall, the survey did not have a high number of participants who identified as a woman. However, what was seen was more a representative aspect of the population in conformance with Engineers Canada statistics on licensure therefore representative of the population of engineers. A parallel survey which was released only to networks supporting engineers who identify as a woman should be necessary to allow a deeper study into barriers that they may face.

6.0 Recommendations and Conclusions

The following are a list of recommendations and conclusions based on the survey observations that the industry can consider in enhancing recruitment and retention strategies in timber engineering design.

A meaningful conclusion to the survey is that while it appears EDI training related to barrier removals, specifically impacts on gender, is being provided at medium to large sized Canadian firms which practice timber structural engineering, it is lacking in small firms. Even small firms which practice timber structural engineering should consider training in EDI consideration especially with respect to barriers that populations may experience. This will only help with retention practices as employees may transition in their careers to other companies.

There exists potential for timber engineering to instill retention aspects to those undertaking work in the field. This is correlated to respondents' preferences to the challenging nature of design, biophilia and sustainability impacts which pertain closely to engineering design today these should be considered when developing EDI strategies.

There is no correlation that the focus of an engineering degree at this point leads one to the undertaking of timber specific engineering. This is impacted by the lack of timber specific engineering programs as indicated in the surveys freeform section responses. While effort has been made to create free and off-the-shelf timber focused courses that any university may freely use by the Canadian Wood Council, there are accreditation barriers which impact the adoption of these courses also exemplified in the survey responses. Growing sustainability objectives are very clear that the industry is about to enter a further renaissance in construction with timber buildings (mid-rise and high-rise buildings, bridges, stations, etc.). Major metropolitan centers in Canada have already laid the foundation necessary for timber production. It is therefore desired for the promotion of timber structural engineering that the next generation of students undertaking university studies be educated in this subject in the same manner that they were in steel and concrete structures decades before them. The need for this is further made evident that current practitioners are not as experienced with engineered products such as CLT.

Universities can consider integrating timber experiential learning such as a capstone-based project or competition-based design opportunities into their offerings, as is often seen in concrete and steel design courses. It is clear from the survey motivation to work in timber is

fostered by work-place design. These large project-styled aspects can be introduced into an undergrad program and aligns with both the interests from women (undergrad experiences) and men (project-based experiences). There are a number of timber based competitions in Canada that could be leveraged by institutions to enhance experiential learning opportunities (Troitsky Bridge Building and TimberFever competitions being two timber based student competitions offered in Canada as of the time of writing).

Moreover, it has been shown that experiential learning – the process of learning by doing, which includes capstone-style projects – has a positive influence on retention as seen in engineering as well as other fields (Prussia and Weis, 2004; Zaurin, 2018), and so added experiential opportunities could contribute positively to the retention of students and engineers within the profession.

These findings have laid a groundwork for future research and provided a baseline for understanding how specific studies, such as timber structural engineering, can affect the recruitment and retention of diverse peoples. Of note, future studies regarding support needs for those in their mid-career are needed. As seen through the data collected in this study, there are few women in their late career. Providing support to those in their mid-career can help develop a sense of fit and belonging, encouraging those to remain in the field. This can then lead to the future generations entering their early career having the opportunity to have role-models and mentors they can relate to.

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Ethics Clearance

York University ethic clearance was granted under certificate e2022-219

References

Aiston, S.J., 2016. Whose academy? Gender and higher education, in: Researching Higher Education. Routledge, pp. 80–96.

Bonikowska, A., Frank, K., Frenette, M., 2022. Occupational Profile and Work Tasks of Canadian PhDs: Gender and Field of Study Differences (No. 36-28– 0001). Statistics Canada

Boton, C., 2018. A Framework for Building Information Modeling Implementation in Engineering Education. Canadian Journal of Civil Engineering 45, 866–877. https://doi.org/10.1139/cjce-2018-0047

Canadian Commission on Building and Fire Codes, 2022. National Building Code of Canada 2020.

Chachra, D., Kilgore, D., Loshbaugh, H., McCain, J., Chen, H., 2008. Being and Becoming: Gender and identity Formation of Engineering Students, in: ASEE Annual Conference and Exposition, Conference Proceedings. https://doi.org/10.18260/1-2--3597

Clark Blickenstaff, J., 2005. Women and science careers: leaky pipeline or gender filter? Gender and Education 17, 369–386. https://doi.org/10.1080/09540250500145072

Daneshvar, H., Goni, T., Zhang, S., Kelterborn, R., Chui, Y.H., 2021. Structural Timber Design in Curricula of Canadian Universities: Current Status and Future Needs. Education Sciences 11. https://doi.org/10.3390/educsci11120765

Daoud, A., Tsehayae, A., Fayek, A., 2017. A Guided Evaluation of the Impact of Research and Development Partnerships on University, Industry, and Government. Canadian Journal of Civil Engineering 44, 253–263. https://doi.org/10.1139/cjce-2016-0381

Dasgupta, N., Stout, J.G., 2014. Girls and Women in Science, Technology, Engineering, and Mathematics: STEMing the Tide and Broadening Participation in STEM Careers. Policy Insights from the Behavioral and Brain Sciences 1, 21–29. https://doi.org/10.1177/2372732214549471

de Pillis, E., de Pillis, L., 2008. Are Engineering Schools Masculine and Authoritarian? The Mission Statements Say Yes. Journal of Diversity in Higher Education 1, 33–44. https://doi.org/10.1037/1938-8926.1.1.33

Easa, S.M., 2013. Framework and Guidelines for Graduate Attribute Assessment in Engineering Education. Canadian Journal of Civil Engineering 40, 547–556. https://doi.org/10.1139/cjce-2012-0485

Engendering Success in STEM, 2023. Engendering Success in STEM. URL https://successinstem.ca (accessed 4.2.23).

Engendering Success in STEM, 2022. Gender Inclusion & Fit in STEM [WWW Document]. URL https://successinstem.ca/wp-content/uploads/2022/12/Gender-Inclusion-and-Fit-in-STEM-Final.pdf (accessed 3.28.23)..

Engineers Canada, 2020. 2020 National Membership Information [WWW Document]. URL https://engineerscanada.ca/reports/2020-national-membership-information#-summary (accessed 1.26.24).

Engineers Canada, 2015. National Membership Report 2015 [WWW Document]. URL https://engineerscanada.ca/reports/reports/national-membership-report-2015 (accessed 1.26.24).

Engineers Canada, n.d. 30 by 30 [WWW Document]. URL https://engineerscanada.ca/diversity/women-in-engineering/30-by-30 (accessed 7.7.22).

Hamlet, L.C., Roy, A., Scalone, G., Lee, R., Poleacovschi, C., Kaminsky, J., 2021. Gender and Engineering Identity among Upper-Division Undergraduate Students. Journal of Management in Engineering 37. https://doi.org/10.1061/(asce)me.1943-5479.0000876

Kalev, A., Dobbin, F., Kelly, E., 2006. Best Practices or Best Guesses? Assessing the Efficacy of Corporate Affirmative Action and Diversity Policies. Am Sociol Rev 71, 589–617. https://doi.org/10.1177/000312240607100404

Kotsovinos, P., 2022. The CodeRed Experiments - Evidence Based Fire Safety Solutions for Timber Buildings.

Kotsovinos, P., Rackauskaite, E., Christensen, E., Glew, A., O'Loughlin, E., Mitchell, H., Amin, R., Robert, F., Heidari, M., Barber, D., Rein, G., Schulz, J., 2022. Fire dynamics inside a large and open-plan compartment with exposed timber ceiling and columns: CodeRed #01. Fire and Materials 1–27. https://doi.org/10.1002/fam.3049

Lasby, D., 2023. Shifting Power Dynamics: Equity, Diversity, and Inclusion in the Nonprofit Sector. Equitable Recovery Collective.

Martins-Robalino, A., Wang, A., Chorlton, B., Gales, J., 2022. A Thematic Review of Canadian Engineering Education Research between 2017-2021, in: 13th Canadian Engineering Education Association's Annual Conference. Toronto.

May, E., Strong, D.S., 2011. Is Engineering Education Delivering What Industry Requires. PCEEA. https://doi.org/10.24908/pceea.v0i0.3849

Mazur, N., Chorlton, B., Ellingham, J., Gales, J., 2019a. Canadian Women in Engineering Academia and Industry. Canadian Consulting Engineer 26–28.

Mazur, N., Chorlton, B., Gales, J., 2019b. Comparing the Experiences of Women in Undergraduate Engineering Across Different Schools, in: 10th Canadian Engineering Education Association's Annual Conference. Ottawa.

McCormick, M., Bielefeldt, A.R., Swan, C.W., Paterson, K.G., 2015. Assessing students' motivation to engage in sustainable engineering. International Journal of Sustainability in Higher Education 16, 136–154. https://doi.org/10.1108/IJSHE-06-2013-0054

Meyers, K.L., Ohland, M.W., Pawley, A.L., Silliman, S.E., Smith, K.A., 2012. Factors Relating to Engineering Identity. Global Journal of Engineering Education 14, 119–131.

National Research Council, 2009. Gender differences at critical transitions in the careers of science, engineering, and mathematics faculty. National Academies Press, Washington, DC.

National Resources Canada, 2022. The State of Mass Timber in Canada [WWW Document]. URL https://nrcan-rncan.maps.arcgis.com/apps/dashboards/041e338d2a4d4b3a82ff2c238a9f0f93 (accessed 1.25.24)

Oehlberg, L., Shelby, R., Agogino, A., 2010. Sustainable product design: Designing for diversity in engineering education. International Journal of Engineering Education 26, 489–498.

Perreault, A., Franz-Odendaal, T., Langelier, E., Farenhorst, A., Mavriplis, C., Shannon, L., 2018. Analysis of the distribution of females and males in STEM fields in Canada. NSERC Chairs for Women in Science and Engineering.

Philion, E., Jeanneret, C., Gales, J., Kelterborn, R., 2022. Enhancing Timber Engineering Education with Development and Analysis of an Off-Shelf Course, in: NICHE. Victoria.

Prussia, G.E., Weis, W.L., 2004. Experiential Learning Effects on Retention: Results from a Required MBA Course. Journal of College Student Retention: Research, Theory & Practice 5, 397–407. https://doi.org/10.2190/5NU3-FCP6-LU88-5282

Quiquero, H., Smith, M., Gales, J., 2018. Developing Fire Safety Engineering as a Practice in Canada. Canadian Journal of Civil Engineering 45, 527–536. https://doi.org/10.1139/cjce-2016-0552

Rodrigues, A., 2021. 2020 Canadian Engineers for Tomorrow: Trends in Engineering Enrolment and Degrees Awarded 2020. Engineers Canada.

Saffie-Robertson, Ma.C., 2020. It's Not You, It's Me: An Exploration of Mentoring Experiences for Women in STEM. Sex Roles 83, 566–579. https://doi.org/10.1007/s11199-020-01129-x

Sandler, B.R., Silverberg, S.A., Hall, R.M., 1996. The Chilly Classroom Climate: A Guide to Improve the Education of Women.

Zaurin, R., 2018. Preparing the Engineering Student for Success with IDEAS: A Second Year Experiential Learning Activity for Large-size Classes. Presented at the ASEE Annual Conference & Exposition, Salt Lake City, Utah.

Supplemental A : Ethics Statement and Informed Consent Form

Purpose of the Research: This study aims to determine the impact of timber design studies on attracting diverse populations into engineering. This survey is being distributed to engineering companies across Canada to identify the socio-economic background of those who are working on timber projects, and explore their reasons for working on timber-based projects. Additionally, it will explore their experiences with timber design in Canada.

What You Will Be Asked to Do in the Research: The following survey will take 15 to 20 minutes and the survey involves no more than 23 questions. Please fill out the survey based on your experiences with timber engineering design. Participation is strictly voluntary.

Benefits of the Research and Benefits to You: Your participation in this survey will help improve the knowledge regarding how timber engineering attracts different populations. This will help develop quantifiable evidence to say that timber education is a driving force for diversity in engineering, helping to expand the reach of education and research programs. This will help support the demand for timber structures, by increasing the workforce trained in timber engineering design.

Online Informed Consent Form

Risks and Discomforts: There is minimal risk associated with participating in this study. According to TCPS-2 from the Panel on Research Ethics, this means that the "probability and magnitude of possible harms implied by the participation in the research is no greater than those encountered by participants in those aspects of their everyday life that relate to the research." Participants may find it difficult, upsetting, or emotional to talk about their experiences in engineering. We foresee minimal risk, since the probability and magnitude of these possible harms is no greater than in the participants' everyday life as an engineer. You are not required to answer any questions that makes you uncomfortable or that you find too upsetting.

Voluntary Participation: Your participation in the study is completely voluntary and you may choose to stop participating at any time. Your decision not to volunteer will not influence your relationship with researchers, York University or other groups associated with this project either now, or in the future.

Withdrawal from the Study: You can stop participating in the study at any time, for any reason, if you so decide. Your decision to stop participating, or to refuse to answer particular questions, will not affect your relationship with the researchers, York University, or any other groups associated with this project. In the event you withdraw from the study, all associated data collected will be immediately destroyed wherever possible.

Confidentiality: All information you supply during the research will be anonymous and held in confidence. Your name will not appear in any report or publication of the research. Your data will be safely stored on an external hard drive at the end of survey completion and only research team members will have access to this information. The results will be deleted upon research completion. Data will be stored anonymously. Confidentiality will be provided to the fullest extent possible by law. The researcher acknowledge that the host of the online survey (Microsoft Forms) may automatically collect participant data without their knowledge (i.e., IP addresses.) Although this information may be provided or made accessible to the researchers, it will not be used or saved without participants' consent on the researchers' system. Further, because this project employs e-based collection techniques, data may be subject to access by third parties as a result of various security legislation now in place in many countries and thus the confidentiality and privacy of data cannot be guaranteed during web-based transmission.

Questions About the Research? If you have questions about the research in general or about your role in the study, please feel free to contact Chloe Jeanneret either by telephone at (416) 736-2100, extension 44221 or

by e-mail (chloej96@yorku.ca). This research has received ethics review and approval by the Human Participants Review Sub-Committee, York University's Ethics Review Board and conforms to the standards of the Canadian Tri-Council Research Ethics guidelines. If you have any questions about this process, or about your rights as a participant in the study, please contact the Sr. Manager & Policy Advisor for the Office of Research Ethics, 5th Floor, Kaneff Tower, York University (telephone 416-736-5914 or e-mail ore@yorku.ca).

1. Do you consent in taking part of this survey?
   - Yes
   - No

Supplemental B : Survey

With the push towards a more sustainable building infrastructure identified in the COP26 there has been a global influx of demand for wood construction. To support this demand, increased efforts from universities and colleges in both teaching and research are needed. A thorough equity, diversity, and inclusivity (EDI) plan is typically important in the justification of expanding education and research programs. Currently, there is only an innate knowledge of whether wood design and construction attracts different social groups, with limited quantifiable evidence to say whether wood education, and subsequently design and construction, is a driving force for diversity.

This study aims to determine the impact of wood design studies on attracting diverse populations into engineering. This survey is being distributed to engineering professionals across Canada to better understand the intersectional identities of those who are working on timber projects, and explore their reasons, and interests, for working on timber projects. Additionally, it will explore their experiences with wood design in Canada.

1. Which option best describes your current gender identity?
    - Gender-fluid
    - Man
    - Non-binary
    - Trans man
    - Trans woman
    - Two-Spirit
    - Woman
    - I don’t identify with any option provided
    - I prefer not to answer
2. Which population group(s) do you identify with? (Please select all that apply)
    - Arab
    - Black or African American
    - Chinese
    - Filipino
    - Japanese
    - Korean
    - Latin American
    - South Asian (e.g., East Indian, Pakistani, Sri Lankan, etc.)
    - Southeast Asian (e.g., Vietnamese, Cambodian, Laotian, Thai)
    - West Asian (e.g., Iranian, Afghan)
    - White
    - Asian or Pacific Islander
    - Middle Eastern or North African
    - Indigenous (First Nation, Metis, Inuit, etc.)
    - Population group not listed above
    - I prefer not to answer

3. How old are you?
    - 18-24 years old
    - 25-29 years old
    - 30-34 years old
    - 35-39 years old
    - 40-44 years old
    - 45-49 years old
    - 50-54 years old
    - 55-59 years old
    - 60-64 years old
    - 65+ years old
4. What is your current education level?
    - High school diploma/GED
    - College diploma
    - Bachelors
    - Masters
    - PhD
5. What is your current engineering license status?
    - Fully licensed (P.Eng.)
    - Engineer In Training (EIT)
    - Limited License
    - Temporary License
    - Provisional License
    - None
6. Do you have an immediate family member who is a current or past practicing engineer?
    - Yes
    - No
7. What type of experiences have provided you with wood education? (Please select all apply)
    - Undergraduate course
    - Graduate course
    - Personal Development Hours (PDH) seminar/course
    - Work project
    - Other
8. If you selected ‘Other’ in Question 7, please list what experiences have provided you with timber education.
9. Which of the following experiences has most significantly motivated you to pursue timber engineering design? (Please select all that apply)
    - Undergraduate course
    - Graduate course
    - Personal Development Hours (PDH) seminar/course
    - Work project
    - Other

10. If you selected 'Other' or want to elaborate on your selection(s) for Question 9, please do so here.
11. How long have you been practicing structural engineering design (in years)?
12. Specifically, how long have you been practicing wood engineering design (in years)?
13. If you have worked on wood design projects, what range of projects were undertaken, even if only to conceptual design? (Please select all that apply)
    - Low rise (<6 storeys)
    - Mid rise (6-10 storeys)
    - High rise (10+ storeys)
14. If you have worked on wood design projects, what type of occupancies were considered for the projects undertaken, even if only to conceptual design? (Please select all that apply)
    - Assembly occupancies
    - Care treatment or detention occupancies
    - Residential (single family) occupancies
    - Residential (multi-family) occupancies
    - Business and personal service (offices) occupancies
    - Mercantile (retail) occupancies
    - Industrial occupancies
15. If you have worked on wood design projects, what type of wood products were specified, even if only to conceptual design? (Please select all that apply)
    - Light frame
    - Engineered trusses
    - Engineered Wood Products e.g. I-joist, Laminated Veneer Lumber (LVL), Parallel Strand Lumber (PSL), etc.
    - Glue Laminated Timber (Glulam)
    - Cross Laminated Timber (CLT)
    - Nail Laminated Timber (NLT)
    - Dowel Laminated Timber (DLT)
    - Other
16. If you selected 'Other' or want to elaborate on your selection(s) for Question 15, please do so here.
17. How would rate your passion for wood projects?
    - 1 – Not passionate
    - 2
    - 3
    - 4
    - 5 – Very passionate
18. What is your personal motivation behind working in wood design? (Please select all that apply)
    - Sustainability
    - Biophilia/Aesthetic
    - Challenge/Innovation
    - Other

19. If you selected 'Other' or would like to elaborate on your selection in Question 18, please describe your personal motivation(s) behind working in wood design.
20. Does your desired career path include continuing working in wood design?
    - Yes, for the near future
    - Yes, for the remainder of my career
    - Yes, when the projects arise
    - No
21. How would you rate your enjoyment of your current career in wood design?
    - 1 – Not enjoyable at all
    - 2
    - 3
    - 4
    - 5 – Very enjoyable

Optional Questions

The following set of questions are all optional. These may be considered as identifier questions, therefore it is left up to your discretion to answer any or all questions.

22. If you have completed a post-secondary program, which institution did you attend (If you have attended multiple institutions or are currently enrolled, please only list the most recent/current institution)? If you have not attended a post-secondary institution, please leave blank.
23. Which company/organization do you work for?
24. Which Province/Territory is your company/organization located? Please select one:
    - Alberta
    - British Columbia
    - Manitoba
    - New Brunswick
    - Newfoundland and Labrador
    - Northwest Territories
    - Nova Scotia
    - Nunavut
    - Ontario
    - Prince Edward Island
    - Quebec
    - Saskatchewan
    - Yukon
    - Prefer not to answer
25. How large is your company/organization?
    - Small (less than 20 employees)
    - Medium (20 – 99 employees)
    - Large (100 – 500 or more employees)
    - Unsure how many are employed
    - Prefer not to answer

26. Have you received training which addresses equity, diversity, and inclusion in the workplace?
    - Yes
    - No
    - Prefer not to answer
27. If you responded “Yes” to Optional Q5, please elaborate on the topics of the training.
28. Have you received training which addresses barriers in the workplace that certain populations can face?
    - Yes
    - No
    - Prefer not to answer
29. If you responded “Yes” to Optional Q7, please elaborate on the topics of the training.
30. Do you have any additional feedback you would like to add regarding wood in the design and construction industry?