Literature Review

Women in Technology Programs at SUNY Canton

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The percentage of female to male students attending educational programs in SUNY Canton's Canino School of Engineering Technology is very low compared to not only the female to male percentage of the United States population but also the SUNY Canton student body. This review will look at some history of training women in trades to where we are now in training them for technology and skilled trades. We will start in Victorian era Europe and look at a wide spread effort to train unwed unemployed women for employment in the economy of that society and time. Research has also been done on why women are pushed toward certain training and jobs. This is typically done in the name of equality, but is it actually motivated by the economy and a patriarchal system. What does it take for women to succeed in these male dominated occupations and how can more women be recruited into them and made more comfortable and productive when they get there? Trautman, D.K., Smink, J.M., and Hayden, T.E. (1995) are female professionals in the technology industry and tell their stories and give suggestions for changing the industry and for females who want to succeed in technology training programs and jobs. We will also look at women in skilled trades traditionally dominated by males. Why are these occupations held in such high esteem and what are the obstacles to women trying to enter these fields? I cannot say that I have found the earliest examples of organized training programs and policies that emphasized women working in trades, but we will start with a change of government policy that occurred in Europe around 1850.

Several countries in Europe during the Victorian era found they had a large number of unwed unemployed women. They were looking for ways to train these women for jobs that would make them productive in that era's economy. Albisetti, J.C. (2012) describes the various vocational training institutions and organizations for unwed women in Victorian era Europe. These institutions were created in European countries such as England, France, Belgium, Germany, Italy, and Spain to name a few. They dealt mostly with the training of middle class women in urban areas. The training that was offered focused on work in fields such as clothing trades, clerical, and decorative arts. The trades these women were trained for were not necessarily traditional male dominated fields but I find it interesting to see some connections between how these policies are similar to policies that come later in history and encourage women to pursue training and employment in occupations that were traditionally male dominated.

Brine, J., (1992) discusses the motivation and effects of the European Social Fund on the training of women in underrepresented occupations. It specifically deals with its implementation by the British government. The author makes a connection between the structure of the capital system, patriarchal society, and their effects on the training and job opportunities offered to women. The ESF, as the author calls it, is supposed to promote equal opportunity in the work force. Brine, J. (1992) explains that the ESF "encourages women to learn traditional male skills". However, the concern is that women are only supported in trades that have a basic skill requirement and do not compete with the higher skilled, higher paid, and more influential positions held by men. This initiative does not support women in learning skills that would be considered more traditional for females. This can also be seen in some of the policies and organizations discussed by Albisetti, J.C. (2012). It is striking from my perspective that these views were held so recently in our history. My hope is that this is not the case in modern day first world counties but there are some that would probably argue that this is still an issue. These underlying attitudes may play a part in the low enrollment of female students in technology training programs.

Today the public education system tends to lump what use to be and maybe still are considered traditional male stills and learning under the title of Technology Education. The Technology Education field has been trying to break to old stereotypes of being the male dominated shop class most are familiar with. The idea is to attract students of all genders and backgrounds to take technology courses. Liedtke, J.A. (1995) lays out an opinion about what can be changed in the Technology Education field to attract females and minorities into the field. Some ideas include planning an industry conference relating to women and minorities and encouraging them to take leadership roles in the industry. Maybe as more and more women enter this field the stigma around it will change and more females will follow.

Flowers, J. (1998) discusses research that specifically surveyed women about changes and improvements that could be made to attract female students to Technology Education. It is a bit of an information dump and there is not much investigation into which ideas gained from the survey would be more likely to succeed. However Flowers, J. (1998) does organize the responses in to these general categories; changing the school, helping the students, and increasing awareness of the field. An overall theme in changing the school centered on making the program and courses more inviting to female students by making the lab cleaner and more inviting, offering projects that female students can relate too, and having inviting and supportive instructors. Segregated female only classes and summer camps was another suggestion. The article also discussed focusing recruiting efforts on female students and convincing parents and career counselors that technology classes are a worthwhile endeavor for female students. I was really hoping that this article would have implemented the research of some of the ideas generated in its survey. Most of these concepts are not new and have been tried by the client of our project and there is debate about their effectiveness.

Trautman, D.K., Smink, J.M., and Hayden, T.E. (1995) are three female professionals in Technology Education. In this article they give their perspective to questions about how women can succeed in Technology Education. They don't only suggest how women can succeed as individuals but also discuss improving the involvement of women in the field in general. The focus of the article was mostly on female technology education teachers and their success. The take away that relates to the project that we will be working on is the idea of recruiting females into the field at a young age to help eliminate the social barriers as they get older. As more females enter the industry the idea may be that more will naturally follow in through a strong support system.

Roger, A., Cronin, C., Duffield, J., Cooper, M., Watt, S., (1998/99) are investigating the low enrollment of female students in engineering and technology programs in Scotland's higher education system. They bring up a point made in other articles, there is a shortage of female faculty in these programs. The idea being that female faculty may create an environment that would attract female students. Of the female faculty in academia, the majority of them hold short term employment contracts in relation to their male counterparts. One suggestion made in this article that differs from other articles covered so far is that while programs can be reorganized to attract female students, those changes should not alienate potential male students. Instead, these changes should help attract both female and male students.

Some female students and faculty in technology programs have had negative experiences from inappropriate behavior of male faculty or students. Haynie, III, W.J., (2005) focused on how males in the field treat females in the field. Some surveyed females gave examples of how they were treated improperly and made uncomfortable by male instructors and coworkers. The environment, which may

include the people, needs to change so female members feel comfortable and accepted in their rolls. There may also be some work that needs to be done with students at an early age to prepare and encourage them to pursue technology courses.

Legewie, J. and DiPrete, T. A. (2014) have researched the effects of math and science curriculum on the gender gap in STEM programs. Their research gathered information about female and male students during their transitions from middle school to secondary then into post-secondary and compared their preparation in math and science to their involvement in STEM programs. They state that their data suggests that math and science curricula has a stronger effect on female students choosing STEM programs than it does on males. They go on to suggest in their conclusion that an adolescent's environment in general will have an effect on their following gender stereotypes.

Technology Education is a broad field that covers engineering, math, and science but it can also teach hands on or vocational skills. In this article Adamuti-Trache, M. and Sweet, R., (2008) look at women who attended vocational training at public and private institutions in Canada. The article explains the current climate of vocational jobs in Canada. A majority of this skilled trade workforce are over the aged of 50 and a labor shortage is expected in the future. In general, vocational training will become important to fill theses vacancies. The authors explain that this could create opportunities for females and minorities in training and work. There has been an improvement in the number of women in educational programs related to professional level technology jobs but vocational jobs have been slower to change. The research largely looked at older women with families who are currently employed. I have always known them to be called non-traditional students. They see a connection between this type of student and training programs that are more modular and directly related to a specific job task. I suspect this would allow the student more flexibility and provide a direct correlation to job related skills. Younger more traditional students have less responsibilities and commitments outside of the course work and tend to enter full time more traditionally structured programs. This is an interesting consideration for our own research project because our client has mentioned an interest in attracting not traditional women who are interested in a change of career at this later point in their life when the social barriers are not as strong as they may have been when they were younger. I was able to find another research article that more recently looked at vocational training for women in Canada. It was similar in some ways but had some different perspective that I fee is work investigating.

Lavasseur, K. and Paterson, S., (2016) argue that current Canadian government policies and programs that claim to promote gender equality in the work force are actually setup to serve the capital interests of the economy rather than gender equality. Their research tackles a similar topic of the one discussed by Brine, J., (1992). The argument being made is that women are not being supported in pursuing all types of training that may be available. They are only supported in pursuing those that suit the needs of the economy and are not traditionally associated with women. I believe the implied idea is that these positions need to be filled to strengthen the economy and women and minorities are a convenient resource to increase the number of qualified candidates. There is also the factor of cost of training and the pay for traditional male trades vs. traditional female trades. The research looked at the training and income of a hair stylist and compared it to other male dominant trades. The minimum training cost for hair stylists is much greater at Can $7,060 per level than an automotive technician at Can $600 per level. I believe the author would prefer to see training and employment opportunities supported for men and women in all trades instead of making some easier to enter and others more

difficult. There is question about the true motive of pushing women into these rolls and why are traditional female occupations seemingly held in less importance to traditionally male occupations.

I don't feel any of these articles were a perfect bull's eye to the research project I will be working on. However, I found them very interesting and they gave me some perspective on different ways to approach the research. I am not sure if the European Victorian era training of women in trades could be considered the first type of occupational training that focused on women. It is interesting to see the close relationships between those programs and some of the concerns about programs being implemented today. These women were not being trained in new technology fields as is the focus of some programs today. There is a relationship between them because there is concern that these new programs and policies are motivated more by helping the economy than creating equality in the workforce. Through our research we do hope to address concerns about the environment that is created in institutions that perform training in the technology and skilled trade fields. Research has shown that female students and professionals in these fields may be subjected to uncomfortable situations related to their gender. The physical environment, focus of the learning activities, and the other people involved can all have a positive or negative effect on a student or faculty member's experience. I am interested to see what our research will tell us about the environment at SUNY Canton and how we might be able to improve it. I am concerned about some of the political perspective expressed by Adamuti-Trache, M. and Sweet, R., (2008) that getting women to pursue training and careers in technology and skilled trades may not be truly beneficial to equality but instead will only benefit the economy and patriarchal society. I feel like SUNY Canton is doing this for the write reasons. While the goal of increasing enrollment is always there, I believe we truly want people of all genders and backgrounds to feel comfortable pursuing the training needed to attain the career they would like to spend their future in.

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