How Childcare Can Bridge the Gender Gap In STEM By:Kiran Khan, Nikki Hammond, and Baycha Isik

Motivation & Background

Motivation:

As women getting an education in STEM education, we have experienced the gender gap first hand. Having been the only female in a class or in a ratio of 1 girl to every 13 boys, we have suffered through the gender inequality and stereotypes. Despite women occupying 50% of the workforce, women continued to remain underrepresented in STEM careers (1). An Analysis from 1993 to 2010 found that women only increased their representation in engineering fields from 9% to 13% (2). In the case of computer and mathematical science the population of women actually decreased despite the large industry growth in that time frame (2). A graphical representation of these statistics can be found in the following figure. This motivated our research with Houston

Scholars. We wanted to discover why STEM fields contain such a gender disparity and how we might solve that issue.



Women as a percentage of all workers in S&E occupations: 2 1993-2010

Physical scientists = chemists, physicists, astronomers, and earth/ocean/atmospheric scientists.

Background:

The lack of female representation in STEM can be attributed to a variety of reasons, but our group has identified two we found the most prevalent in our research. The first is a lack of mentoring and role models. With a lack of women in STEM, women entering the industry have a hard time identifying and sustaining relationships with mentors, which is shown to be an important factor in professional development (1). This can lead women to drop out of the industry or switch profession, which is an issue further exacerbated by childbirth or parenthood. Parenthood concerns have disproportionately affected female retention in STEM careers due to gender stereotypes (3). Compared to their male counterparts, women were 20% more likely to leave a full time STEM career after the birth or adoption of a child with a total of 43% of women doing so (3). This inequality needs to be addressed to alleviate growing issues in research including a male bias (4). This bias is especially problematic in the medical field where some cancer treatments, like immunotherapy, have been shown to be significantly less effective in women (4). There is also an impact on the workplace environment.

Research

Preface:

There have been many attempts to increase women participation in STEM, but many of them fail to diagnose the issue at its core. In 2011, the federal government spent \$3 billion tax dollars on encouraging STEM education, however, they haven't acknowledged the discrepancy between women with advanced stem degrees and those that actually remain in the workforce. Our proposed solution is to encourage more tech companies to invest in on site daycare facilities. The institutions with better childcare facilities have twice the number of female faculty in STEM (5).



For example, Patagonia recoups 91% of \$1 million dollars in annual costs thanks to tax breaks and not having to replace workers. This means that not only do companies reap the economic rewards of keeping highly qualified individuals at work, but with increased productivity. (7)

Benefit for Women:

Linguistics are incredibly important in the formation of policy or any other action, and having women at the center of those decisions will lead to better treatment for women's health, cancer treatments, access to aid in hospitals, etc. For example, lack of representation of women in research has led to deficits in the effectiveness of heart disease treatment, pain medications, and much more. The Gendered Innovations website has performed several case studies which depict how considering gender in research results in better and safer outcomes and products. "That could mean coming up with a better design for seatbelts and airbags by having crash dummies built like women, or developing safer drugs by including females in toxicology tests." (8)



Benefits for the children: ¹² Multiple studies have shown that infants who

have limited or no interaction with their mothers are lacking in all areas of development: emotional, language, intellectual, and social skills. Having mothers interacting with their children during breaks is key during the most impressionable times of a child's life. (9)

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Discussion & Conclusion

Problems for Implementation:

Cost is a big factor in any big project, and this one is no different. Approximately 4%-8% of companies offer onsite childcare. Smaller tech companies are less likely to invest in onsite childcare since it is not common and can be rather expensive. Companies will have to cover the costs for the childcare facility, which can rank up to \$30,000 without any construction. (7) Our group must convince companies that these fees will result in a long-term investment; providing child-care facilities will boost employee satisfaction, keep the workplace diverse, and allow parents to



Another foreseeable problem is the responsibility the company will need to take to ensure the wellbeing of the children. This includes any liability issues were the children to get hurt while at the company. Furthermore, the company will need to be confident in providing an engaging, nurturing environment which doesn't stop at the construction of a facility. If there are younger children, caretakers will need to be hired to supervise their activities. There needs to be a proper record regarding the health accommodations of each child, and the caretakers must be aware of it.

Conclusion:

We encourage generations of children who grow up watching their mothers in STEM jobs to become involved in the same thing. Our solution achieves exactly what the federal government has poured billions of dollars into without the billions of dollars. Many companies noticed a double

in their female employees after investing in child care sites over a 5 year period which proves the effectiveness of this strategy.



In the workplace, daughters of employed mothers



have higher annual

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