Women Who Tech

Attitudes and motivations for women using technology & entering technology careers in Kenya

Akirachix 2016
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As at last census (2009 NHP Census), women constituted slightly over half (50.3%) of the entire Kenyan population.

The near equal split does not however reflect in the uptake of opportunities between the two genders.

Kenya has made enormous progress towards expanding access to education, with particular efforts intensified to bridge the gender education gap.

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>GENDER</th>
<th>AGGREGATE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>Registered Consulting Engineers</td>
<td>272 (98.2%)</td>
<td>5 (1.8%)</td>
</tr>
<tr>
<td>Registered Engineers</td>
<td>1,298 (96.8%)</td>
<td>43 (3.2%)</td>
</tr>
<tr>
<td>Reg. Graduate Engineers</td>
<td>4,974 (92.3%)</td>
<td>413 (7.7%)</td>
</tr>
<tr>
<td>Graduate Technicians</td>
<td>1,128 (98.5%)</td>
<td>17 (1.5%)</td>
</tr>
</tbody>
</table>

Source: Engineering Board (2012)
Background

- Debate on gender equity in education currently revolves around females in mathematics and science domains.
- Exams results show that males perform better than girls in mathematics and sciences at secondary school.
- Career selection is one of many important choice student will make that determines the level of disparity between men and women in STEM fields.
Total female enrollment averaged below half, varying from 12% in respect to architecture & engineering to 32% in respect to health sciences.

Trends in Female Enrolment in key STEM Programs (University of Nairobi 1996-2005)

Academic Yr
2004/5 35 27 26 21 15 14
2002/3 33 26 24 19 14 8
2000/1 36 23 24 19 13 11
1998/9 31 20 22 14 15 13
1996/9 26 20 17 18 12 16

Source: Griffin (2007)
Survey Background

- The survey was undertaken in order to understand factors influencing women’s access and participation in Science, Technology, Engineering and Mathematics.
- This report does not however take a gender approach, but rather focuses on women
## Survey Methodology

<table>
<thead>
<tr>
<th>Survey</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Survey Dates</td>
<td>November 2014-January 2015</td>
</tr>
<tr>
<td>Approach</td>
<td>Quantitative and Qualitative approaches</td>
</tr>
<tr>
<td>Sample Size</td>
<td>1,666</td>
</tr>
<tr>
<td>Sampling Methodology</td>
<td>Random Multi-stage stratified using PPS (Population Proportionate to Sample Size)</td>
</tr>
<tr>
<td>Universe (Quantitative leg)</td>
<td>Women aged 15 + living in urban and rural areas</td>
</tr>
<tr>
<td>Target group(Qualitative leg)</td>
<td>Key-informants in STEM related fields (heads of departments, Students, Professionals).</td>
</tr>
<tr>
<td>Data Collection</td>
<td>Face-to-face interviews at household level</td>
</tr>
<tr>
<td>Sampling Error</td>
<td>±3.3% with a 95% confidence level.</td>
</tr>
<tr>
<td>Coverage</td>
<td>Nationally Representative.</td>
</tr>
</tbody>
</table>
Key Findings
Current status; Where are we now?

- Existing data shows that women select careers in a way deny them access to the traditional ‘male’ jobs

- Women make up 41% of the total proportion of university students population

- Female students represent 17% of the total number in Science & Technology related programmes

- The total female enrollment average below half across the STEM programmes, varying from 32% in respect to health sciences to just 12% in respect to architecture & engineering
1. Career preferences & Factors affecting choice
Q: What career would you like to pursue? **STEM-39% and Non-STEM-49%**

**Base: Those still in school/anticipating to go back to school n=1,666**
Drivers for career choices:

- Less competition: 33% (Women who prefer STEM careers), 14% (Women who prefer non-STEM careers)
- Educational requirements: 42% (Women who prefer STEM careers), 19% (Women who prefer non-STEM careers)
- Well paying: 18% (Women who prefer STEM careers), 6% (Women who prefer non-STEM careers)
- Career prospects/Ambition: 32% (Women who prefer STEM careers), 14% (Women who prefer non-STEM careers)
- Advice from others: 5% (Women who prefer STEM careers), 0% (Women who prefer non-STEM careers)
- Other: 3% (Women who prefer STEM careers), 4% (Women who prefer non-STEM careers)
- Job Satisfaction: 3% (Women who prefer STEM careers), 2% (Women who prefer non-STEM careers)

*Base: All respondents, n=1,666*

“Generally I am good in math and physics but I was more into medicine than engineering. I was admitted into college for engineering but basically give me biology, math’s and English” - Electrical Engineering Student
Career choice decisions among pre-career (pursuing a course) and career women in STEM are primarily influenced by personal preferences:

- “Personal preferences” rank first among both those women who favour STEM related careers and those who do not, followed by “family/friends”
- Selection factors currently playing less important roles are “mentors,” “teachers/career guidance,” among others.

Base: Pre-career women and Career women in STEM
Factor contributing to lack of interest in STEM

Factors contributing to lack of interest in STEM

- Difficulty/ Poor in STEM subjects: 57%
- Negative attitude towards course/ practitioners: 10%
- Lack of familiarity: 10%
- Gender stereotypes in STEM: 6%
- Level of effort required to study: 4%
- Uncertainty over job opportunities: 1%
2. Factors Contributing to Interest in STEM
### Career Awareness and Interest

<table>
<thead>
<tr>
<th>Field</th>
<th>Know a lot</th>
<th>Know something</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marketing</td>
<td>17</td>
<td>54</td>
</tr>
<tr>
<td>Journalism</td>
<td>6</td>
<td>48</td>
</tr>
<tr>
<td>Performing Arts</td>
<td>12</td>
<td>39</td>
</tr>
<tr>
<td>Fine Arts</td>
<td>8</td>
<td>45</td>
</tr>
<tr>
<td>Mathematics</td>
<td>3</td>
<td>60</td>
</tr>
<tr>
<td>Medicine</td>
<td>10</td>
<td>52</td>
</tr>
<tr>
<td>Engineering</td>
<td>5</td>
<td>48</td>
</tr>
<tr>
<td>Architecture</td>
<td>2</td>
<td>44</td>
</tr>
</tbody>
</table>

**Positive correlation:** Engineering, Computers/ICT, Architecture and Construction

**Key Point:** Akirachix Outreach to High Schools and Primary Schools
Participants indicated their perceived learning ability - how confident they felt they would succeed if they studied STEM courses.

Coefficient is significant at the 0.01 level (2-tailed)
**Career Self Concept and Interest**

<table>
<thead>
<tr>
<th>Field</th>
<th>Cor. Coeff</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer Science/ ICT</td>
<td>0.148</td>
<td>0</td>
</tr>
<tr>
<td>Math/ Statistics</td>
<td>0.145</td>
<td>0</td>
</tr>
<tr>
<td>Medicine</td>
<td>0.133</td>
<td>0</td>
</tr>
<tr>
<td>Agricultural Sciences</td>
<td>0.113</td>
<td>0</td>
</tr>
<tr>
<td>Engineering</td>
<td>0.107</td>
<td>0</td>
</tr>
<tr>
<td>Architecture</td>
<td>0.097</td>
<td>0.008</td>
</tr>
<tr>
<td>Construction</td>
<td>0.068</td>
<td>0.006</td>
</tr>
</tbody>
</table>

Coefficient is significant at the 0.01 level (2-tailed)

Participants indicated their perceived job ability - how confident they felt to perform competently in STEM careers

Akirachix activities: hack-a-thons, internships, volunteers
Participants were required indicate their perceptions of social, cultural and religious factors in terms of the extent they thought these influenced their interest to pursue a career in STEM.
Factors predicting STEM choices among young women

• **Self efficacy**
  – Competence Beliefs
  – Personal Effort

• **Outcomes and Expectations**
  – Achievement and esteem
  – Financial and Personal goals

• **Social contextual experiences**
  – Aspirations and support
  – Career guidance and information
  – Barriers and obstacles
3. Factors Predicting STEM Choices Among Young Women
Self Efficacy

• Competence Beliefs
  – Significant effect of competence beliefs in Computer Science/ ICT, Biology, Math, Chemistry and physics on STEM choice

• Personal Effort
  – Significant effect of preparation, consulting, practical relevancy of science and math on STEM choice
Outcomes and Expectations

- Achievement and Esteem
  - Interest of recognition on STEM choice
  - Family’s economic uplift on STEM choice

- Financial and personal goals
  - Intrinsic motivations e.g. dream job
  - Career goals e.g. achieve future goals
  - Career success e.g. I would have failed if I didn’t pursue this career
Social Contextual Experiences

• Aspirations and support
  – Personal disposition
  – Underlying interest or preferences

• Learning, teaching and living environment
  – Career guidance and information
  – Parental messaging on STEM choice

• Barriers and obstacles
  – Performance- Academic ability
  – Gender norms and social cultural context- Cultural and religious sentiments about girls
Conclusion

• Foster young women’s confidence levels in STEM to make them feel capable.
• Provide career counseling to increase the students' awareness of STEM fields.
• Role of parental guide to career decision. Significant effect of parental messaging on STEM choice.
• Provide and support effective learning environments: in terms of the delivery of effective science and techno instruction, and providing a social environment for students that encourages dialogue with teachers and other students.
• Cultural and religious sentiments about girls- Women in STEM gave higher scores (than non-STEM) to the effect of gender norms and social-cultural context as a barrier to joining a STEM career
Thank You

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