Several Female Support Activities Later – What have we learned?

WIRE-EUGAIN Workshop
ECSS 2022
Hamburg, 26.10.2022

Gerti Kappel
Laura Kovács
Faculty of Informatics
TU Wien
Some Statistics – Bachelors

Introduction of ranking test
Introduction of Data Science Master

Some Statistics – Masters

<table>
<thead>
<tr>
<th>Year</th>
<th>Beginners (male)</th>
<th>Beginners (female)</th>
<th>Graduates (male)</th>
<th>Graduates (female)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011/12</td>
<td>378</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2012/13</td>
<td>321</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2013/14</td>
<td>318</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2014/15</td>
<td>305</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2015/16</td>
<td>311</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2016/17</td>
<td>285</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2017/18</td>
<td>278</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2018/19</td>
<td>402</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2019/20</td>
<td>334</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2020/21</td>
<td>392</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2021/22</td>
<td>395 (75.5%)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Beginners (male): 82.1%
- Beginners (female): 17.9%
- Graduates (male): 128 (24.5%)
- Graduates (female): 86 (75.5%)
Some Statistics – Doctoral Students

- Graduates (male): 83.3% (2012/13), 71.4% (2013/14), 59.2% (2014/15), 60.0% (2015/16), 55.0% (2016/17), 67.0% (2017/18), 41.0% (2018/19), 50.0% (2019/20), 55.0% (2020/21), 45.0% (2021/22)
- Graduates (female): 16.7% (2012/13), 28.6% (2013/14), 40.8% (2014/15), 40.0% (2015/16), 45.0% (2016/17), 53.0% (2017/18), 59.0% (2018/19), 50.0% (2019/20), 45.0% (2020/21), 16.7% (2021/22)
Some more Statistics @ Professor Level (as of Sept 1 2022)

• 7 women *out of* 30 Full Professors (23.3%)

• 5 women *out of* 29 Associate Professors (17%)

• 6 women *out of* 12 Assistant Professors (50% 😊)
  ✓ + 1 via excellence program from rectorate in 2023
  ✓ + 4 via excellence program from rectorate in 2025
  ✓ + 1 via decision of the dean in 2025
What happened so far at TUW and Informatics level (selected list)

• Women's Postgraduate College for Internet Technologies (WIT, 2003-2007), Faculty of Informatics, www.wit.at

• WIT 2, 4 Faculties of TU Wien (2008-2011)
• FIT Days („Frauen in die Technik“, since 1999)
• IT sommer workshops for female pupils (since 2005)
• BLUE&MINT mentoring, Kooperation IBM / TU Wien (since 2012)
• Post-doc positions for female scientists
• Online mentoring for female students (beginners)
• Mentoring for female Master/PhD/Post-doc students
Current female support activities (selected list)

- Attract – Retain – Promote – Sensitize

- FIT Days („Frauen in die Technik“, since 1999)
- IT/Coding Summer Camp for Girls (GirlsCodeTUgether)
- MOOC „Programming with Processing“
- Entry exam (ranking test) without m/f discrimination
- Interface with Schools – eduLAB
  - Workshops and permanent exhibition „Abenteuer Informatik“
- Bridging course „Introduction to Programming with Processing“
  - for female (and male) students
  - learn and network
Summer camp

GirlsCodeTUgether

- 5-day programming summer camp for seven girls (10-14 y)
- Focus on programming with unplugged activities inbetween
- Content
  - Programming of games with Scratch & Processing
  - Experiments with Sphero BOLT & LEGO MINDSTORMS & Boston Dynamics
  - Unplugged: Coding and AI
- First implementation July 2022
- Yearly implementation under (strong) consideration
“Abenteuer Informatik“ Exhibition

Motivation and Aims
• Create enthusiasm among pupils for Informatics
• Provide incentives for Informatics education at schools
• Strengthen the interface between TU Wien and schools

Facts
• Imparts ways of thinking in Informatics illustrated with typical problems
• 10 topics consisting of 4-5 panels (80cm x 200cm) each
• Various interactive experiments with tangible artifacts
• Implemented as a permanent exhibition
• Workshops for school classes from 5th to 13th grade (some workshops also with primary schools)
“Abenteuer Informatik“ Workshops

• social responsibility
  – involve socially disadvantaged people
  – involve female students
  – close gap between school and university
  – involve a large amount of students in informatics activities

• realistic view on informatics
  – propagate thinking informatically
  – comprehend informatics as a science that shapes the world
  – show the breadthness of informatics
  – propagate a scientific style of informatics education

• impulses for teachers
  – develop new learning materials
  – propagate discovery learning
  – propagate group learning
  – involve more teachers in informatics activities

• impulses for students
  – arouse interest to study at a university
  – motivate to be deeper interested in informatics
  – provide fun and enjoyment with informatics
<table>
<thead>
<tr>
<th>School type</th>
<th>Classes</th>
<th>Female students</th>
<th>Male students</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volksschule</td>
<td>1</td>
<td>10</td>
<td>8</td>
<td>18</td>
</tr>
<tr>
<td>Neue &amp; Wiener Mittelschule</td>
<td>9</td>
<td>81</td>
<td>106</td>
<td>187</td>
</tr>
<tr>
<td>Gymnasium Unterstufe</td>
<td>4</td>
<td>41</td>
<td>46</td>
<td>117</td>
</tr>
<tr>
<td>Polytechnische Schule</td>
<td>3</td>
<td>16</td>
<td>31</td>
<td>47</td>
</tr>
<tr>
<td>Berufsschule</td>
<td>2</td>
<td>9</td>
<td>31</td>
<td>40</td>
</tr>
<tr>
<td>Handelsschule</td>
<td>3</td>
<td>36</td>
<td>32</td>
<td>68</td>
</tr>
<tr>
<td>Gymnasium Oberstufe</td>
<td>5</td>
<td>27</td>
<td>41</td>
<td>38</td>
</tr>
<tr>
<td>HTL</td>
<td>4</td>
<td>12</td>
<td>87</td>
<td>99</td>
</tr>
<tr>
<td>HAK</td>
<td>3</td>
<td>31</td>
<td>38</td>
<td>69</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>34</strong></td>
<td><strong>263</strong></td>
<td><strong>420</strong></td>
<td><strong>683</strong></td>
</tr>
</tbody>
</table>

"Abenteuer Informatik" Workshops Summer Term 2019

Students: 683
<table>
<thead>
<tr>
<th>School type</th>
<th>Classes</th>
<th>Female students</th>
<th>Male students</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volksschule</td>
<td>1</td>
<td>9</td>
<td>13</td>
<td>22</td>
</tr>
<tr>
<td>Neue &amp; Wiener Mittelschule</td>
<td>5</td>
<td>35</td>
<td>41</td>
<td>76</td>
</tr>
<tr>
<td>Gymnasium Unterstufe</td>
<td>13</td>
<td>165</td>
<td>161</td>
<td>326</td>
</tr>
<tr>
<td>Polytechnische Schule</td>
<td>1</td>
<td>0</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>Berufsschule</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Handelsschule</td>
<td>1</td>
<td>0</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Gymnasium Oberstufe</td>
<td>8</td>
<td>58</td>
<td>59</td>
<td>117</td>
</tr>
<tr>
<td>HTL</td>
<td>1</td>
<td>2</td>
<td>14</td>
<td>16</td>
</tr>
<tr>
<td>HAK</td>
<td>1</td>
<td>5</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>HLA</td>
<td>1</td>
<td>14</td>
<td>7</td>
<td>21</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>32</strong></td>
<td><strong>288</strong></td>
<td><strong>344</strong></td>
<td><strong>632</strong></td>
</tr>
</tbody>
</table>
Workshops Summer Term 2022
March 1 – September 30 2022

<table>
<thead>
<tr>
<th>Schulstufe &amp; Schultyp</th>
<th>Teilnehmerinnen</th>
<th>Teilnehmer</th>
<th>Gesamt</th>
</tr>
</thead>
<tbody>
<tr>
<td>OS</td>
<td>214</td>
<td>263</td>
<td>477</td>
</tr>
<tr>
<td>Gymnasium</td>
<td>198</td>
<td>200</td>
<td>398</td>
</tr>
<tr>
<td>HTL</td>
<td>3</td>
<td>40</td>
<td>43</td>
</tr>
<tr>
<td>Polytechnische Schule/Fachmittelschule</td>
<td>3</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Sonstige</td>
<td>10</td>
<td>16</td>
<td>26</td>
</tr>
<tr>
<td>US</td>
<td>226</td>
<td>192</td>
<td>418</td>
</tr>
<tr>
<td>Gymnasium</td>
<td>144</td>
<td>133</td>
<td>277</td>
</tr>
<tr>
<td>Mittelschule</td>
<td>48</td>
<td>49</td>
<td>97</td>
</tr>
<tr>
<td>Polytechnische Schule/Fachmittelschule</td>
<td>10</td>
<td>1</td>
<td>11</td>
</tr>
<tr>
<td>Sonstige</td>
<td>24</td>
<td>9</td>
<td>33</td>
</tr>
<tr>
<td>VS</td>
<td>12</td>
<td>12</td>
<td>24</td>
</tr>
<tr>
<td>Volksschule</td>
<td>12</td>
<td>12</td>
<td>24</td>
</tr>
<tr>
<td>Erwachsen</td>
<td>2</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Sonstige</td>
<td>2</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Gesamt</td>
<td>454</td>
<td>473</td>
<td>927</td>
</tr>
</tbody>
</table>
Workshops Summer Term 2022 – school type / grade
March 1 – September 30 2022

<table>
<thead>
<tr>
<th>Schultyp</th>
<th>3</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>Erw.</th>
<th>Gesamt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gymnasium</td>
<td>52</td>
<td>56</td>
<td>169</td>
<td>306</td>
<td>92</td>
<td></td>
<td></td>
<td></td>
<td>675</td>
</tr>
<tr>
<td>HTL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>43</td>
<td></td>
<td>43</td>
</tr>
<tr>
<td>Mittelschule</td>
<td>22</td>
<td>31</td>
<td>44</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>97</td>
</tr>
<tr>
<td>Polytechnische Schule/Fachmittelschule</td>
<td>11</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>21</td>
</tr>
<tr>
<td>Sonstige</td>
<td>26</td>
<td>7</td>
<td>8</td>
<td>18</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td>67</td>
</tr>
<tr>
<td>Volksschule</td>
<td>24</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>24</td>
</tr>
<tr>
<td>Gesamt</td>
<td>24</td>
<td>78</td>
<td>85</td>
<td>200</td>
<td>55</td>
<td>324</td>
<td>153</td>
<td>8</td>
<td>927</td>
</tr>
</tbody>
</table>
Workshops
October 1-25 2022

<table>
<thead>
<tr>
<th>Schulstufe &amp; Schultyp</th>
<th>Teilnehmerinnen</th>
<th>Teilnehmer</th>
<th>Gesamt</th>
</tr>
</thead>
<tbody>
<tr>
<td>OS</td>
<td>28</td>
<td>42</td>
<td>70</td>
</tr>
<tr>
<td>Gymnasium</td>
<td>20</td>
<td>16</td>
<td>36</td>
</tr>
<tr>
<td>HAK</td>
<td>8</td>
<td>26</td>
<td>34</td>
</tr>
<tr>
<td>US</td>
<td>27</td>
<td>24</td>
<td>51</td>
</tr>
<tr>
<td>Gymnasium</td>
<td>27</td>
<td>24</td>
<td>51</td>
</tr>
<tr>
<td>Gesamt</td>
<td>55</td>
<td>66</td>
<td>121</td>
</tr>
</tbody>
</table>
Bridging course „Intro to Programming with Processing“

- Two courses 185A86 and 185A82 (male/female)
- WS 2016 – WS 2019

- Effects on first study year
- Effects on whole study life cycle

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>female</td>
<td>38 / 74</td>
<td>40 / 53</td>
<td>34 / 80</td>
<td>44 / 83</td>
</tr>
<tr>
<td>male</td>
<td>17 / 466</td>
<td>37 / 456</td>
<td>45 / 438</td>
<td>52 / 480</td>
</tr>
</tbody>
</table>
Bridging course „Intro to Programming with Processing“
ECTS performance of first study year
Bridging course – study progress based on cohorts
Current female support activities (selected list)

• Paid female master students
  – financially supported via dean’s budget
  – 6 positions 2016 – 2019

• “Visit a scientific conference” for female master students
  – 35 scholarships in 2016 – 2019 (then came Corona, we’re reviving it)

• Excellence scholarships for female bachelor / master students
  – financially supported by SIEMENS AG Austria
  – 10 scholarships per year
Current female support activities (selected list)

• “Talk at scientific conferences” for female PhD students
  – 38 scholarships in 2016 – 2019 (then came Corona, we’re reviving it)

• Post-doc positions for female scientists (since 2008)
  – 8 so far
  – 3 out of these 8 are full professors at the faculty right now

• Assistant Professorships (Tenure Track) for female scientists
  – 1 filled 2018 (out of 55 highly competitive applications)
  – 2 filled 2021 (out of 41 highly competitive applications)
Current female support activities (selected list)

• Attend Gender Awareness Workshops at TU Wien
  – 28 so far (winter term 2016 + summer term 2017)
  – willingness of colleagues is limited 😞

• Foster female guest professorships
  – 9 so far (out of 78, less than 12% 😞)

• Gender competence as desired competence for professor positions
  – part of official hiring procedure of TU Wien since Oct 2021
180 women and 180 men were asked to review a mathematics paper and rate it from 1 (very good) to 5 (very poor).

<table>
<thead>
<tr>
<th>author</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>John T. McKay</td>
<td>1.9</td>
<td>2.3</td>
</tr>
<tr>
<td>Joan T. McKay</td>
<td>3.0</td>
<td>3.0</td>
</tr>
<tr>
<td>J. T. McKay</td>
<td>2.7</td>
<td>2.6</td>
</tr>
</tbody>
</table>


*) this slide is courtesy of Dr. Brigitte Ratzer, TU Wien
Side step 2 - ... different ratings for women*)

**Total impact** = Addition of the impact factors of all published journal articles

**Competence score:** impact factors
- Scientific productivity
- Gender
- Acquaintance with jury members


*) this slide is courtesy of Dr. Brigitte Ratzer, TU Wien
Side step 3 - ... what biases do you have?*)

https://implicit.harvard.edu/implicit/takeatest.html

*) this slide is courtesy of Dr. Brigitte Ratzer, TU Wien
What we have learned...

• Our competitor
  – Conservative society (home, school, culture)

• Mindset
  – Women are not in need of support but worthy of support

• Female students have to learn to accept support activities
  – Opinion poll (summer 2015) among female BI/CS students: only 27% are in favour of female support activities
What we have learned ...

• Learn from best practice examples
  – CMU (Lenore Blum)
  – Harvey Mudd College (Maria Klawe)
  – University of Edinburgh (Jane Hillston)
  – University of Bamberg (Ute Schmid)
  – ...

• Curricula in universities have to be adapted

• Appropriate curricula in schools are necessary
  – Teach the teacher
What we have learned...

• Role Models
  – Necessary at all career levels
  – AcademiaNet - [http://www.academia-net.de](http://www.academia-net.de)

• Worthy of support
  – Dean's List, especially for female students
  – Award for attending Grace Hopper Conference (not yet realized)

• Sustainability, sustainability, sustainability, ...
  – (not only CO₂ reduction but female empowerment 😊)

• Resources necessary (money, human resources)
Instruments @ TU Wien

• Vice Rector for Human Resources and Gender
• Office for Gender Competence
  – At Vice Rector level
• Working group on equality issues
• Faculties @ TU Wien (have to) implement female support activities (gradually)

• Most importantly - Kindergarten @ TU Wien
  – Christiane Nüsslein-Volhard,
    Nobel prize 1995 in Physiology or Medicine,
    Foundation for the promotion of female scientists with children!
COST Action 19122 EUGAIN – Mapping to WGs
MC members: Gerti Kappel, Laura Kovács

WG1 - From High-School to Informatics
- Abenteuer Informatik Workshops for Schools
- Digital Girls Hackathon at Vienna Digital Days 2021
- Girls Coding Summer Camps
- Bridging Course „Intro to Programming“

WG2 - From Undergraduate Studies to PhD
- Master stipends for conference attendances
- Best master thesis awards (e.g. Dr. Maria Schaumayer prize)
- SIEMENS excellence scholarships for female students

WG3 - From PHD to Professors
- dedicated female tenure-track positions since 2018
- 2 Netidee female fellowships for innovative PhD research
- TUWien Women’s Award 2020/2022

WG4 – Cooperation with Industry and Society
- Consolidating the Digital Humanism Initiative
- TUforMath Lectures Series
- SCIENCE Lecture Series of the Vienna Universities and the City of Vienna

WG5 – Strategy & Dissemination
- EU Marie Skłodowska-Curie COFUND Doctoral programme LogiCS@TU Wien
- Special Research Program SpyCoDe of the Austrian Science Fund
- TU Wien Doctoral College SecInt