#*fem*inno

SUCCESSFUL INNOVATION

A Guideline for Female Scientists in the Life Sciences at Swiss Universities

Successful Innovation.
A Guideline for Female Scientists in the Life Sciences at Swiss Universities.

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Contents

feminno supports female scientists (doctoral students and postdocs) in their ideation processes and encourages the maturation of innovative ideas associated with either research or (social) interests.

Editorial

This guideline is for women in life sciences who are looking for encouragement and want to make use of their drive and know-how and competences to assess the potential of their own ideas. We strongly believe that the conditions for female scientists to become entrepreneurs have never been better.
Nothing should hold women back from the conviction that their ideas have value and that they MUST consequently enter the marketplace for e.g. Switzerland to remain competitive, and for society to grow in gender equality. Women-owned Small Medium Enterprises (SMEs) are reported to be growing at a faster rate than the economy as a whole in several OECD countries; however, the removal of a number of obstacles would allow their potential to be fully tapped.
Appreciations and encouragement also for alternative career paths, such as a job in industry and for entrepreneurship opportunities by the universities would naturally encourage both men and women to assess their research and ideas for innovation potential. Mentoring highly qualified female academics in the life sciences at the interface between the academic world, the private sector and entrepreneurship should also be perceived as the task of the universities.
A bottleneck in the innovation process is the ideation phase. Often female scientists are not exploring their ideas because they think that these are without economic value. It is the task of entrepreneurship programs aimed at women to dissolve this bias and to allow the women to get the necessary economic return for their services.
Women might put emphasis on different topics (e.g. social innovation, sustainable development) than the one that academic innovation ecosystems support. Technological-oriented academic innovation support could open up other fields beyond biomedicine, deep technologies or biotechnology to attract women and to allow them to relate their virtues to entrepreneurial activities.
Women-only entrepreneurial programs may focus on innovations related to the needs and interests of female innovators and enable the channelling of energy and expertise to the appropriate ecosystems.
Timely women-only accelerator and mentoring programs show how to build supporting networks that include other women; how to access to mentoring, experts and inspiring female role models; and provide plenty of encouragement.
Having children creates many uncertainties, shifts priorities and requires the establishment of models for life balance. Sharing best practices is of high value for the participants also in women-only entrepreneurial programs.

With this in mind we launched *fem*inno – Female Innovation and Career Development in Life Sciences in 2018 to strengthen the competencies of female scientists to set their innovation into practice.

These guidelines were developed as a helpful tool for female scientists, entrepreneurs, educators, coaches and all those involved in gender equality.

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Part 1 is for female scientists with a great idea on mind:

In **Towards increasing female impact on innovation**, Ute Budliger reflects on the role of women in entrepreneurship and its current practice.
In **Career engagement and preparedness**, Daniela Gunz and Roger Gfroerer guideline to proactively design important career transitions.
In **Why negotiation is your key in starting innovation from the academic lab**, Carl Emerson shows that having strong negotiation skills allows you to establish what is your current baseline from which you position your new development. He introduces the best negotiation process according to the Harvard Negotiation Project and gives a Negotiation Preparation Checklist.
In **Best practice recommendations for a good life balance**, Tanja Neve-Seyfarth et al. gives good practices for a woman's career as well as for her private life that may contribute to a good life balance. The authors give an overview on institutional support at Universities of Zurich and Basel as well as ETH Zurich for example on organizing the maternity leave, visibility at event, academic age in grant applications but also personal measurements as for example organizing the work load, avoiding gate keeping, and the negotiation of family work with partner and employers.
In **How to apply the Business Canvas to your innovation project**, Isabelle Siegrist discusses the innovation steps from business idea generation to market validation from a gender sensitive viewpoint.
In **Where do you get support for your project?**, Melanie Paschke and Manuela Dahinden provide information on how to access innovation support services, funding, awards, female innovation programs and networks.

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Part 2 is for educators, coaches and all those involved in gender equality:

In **Insights into *fem*inno**, Ute Budliger and Melanie Paschke present the outline and curriculum of the *fem*inno program as an example for an impactful, women-only, innovation program at Swiss universities.
In **Towards an innovation-friendly culture for female scientists: Results from a Delphi survey**, Melanie Paschke et al. explored the views of *fem*inno participants, as well as experts in the fields of innovation management, gender equality, entrepreneurship, research or from other areas about the facilitators, barriers, requirements, resources and incentives that influence that female scientists can become successful innovators. What can institutionalized innovation and mentoring programs do to support female scientists, to establish networks and elevate confidence? How could a innovation-friendly entrepreneurial academic culture be supported by institutionalized programs?

Towards increasing female impact on innovation

Ute C. Budliger
Zurich-Basel Plant Science Center

Innovation is by definition the introduction of something new. Without innovation, there is nothing new, and without anything new, there can be no progress. And, with no progress, there is no relevance for the future. Innovation is the central reason behind modern existence. Although innovation can lead to undesirable consequences, change is inevitable and in most cases, innovation creates positive change.

For Switzerland only 4.72% women of the total adult population between the ages of 18 and 64 years were in the process of starting a company in 2018 (men: 9.98%) (Baldegger et al., 2019). An average 19.6% of founders in Switzerland are women, which is above the European average of 17.2% (Steigerthal & Mauer, 2018). The recent focus topic of the ETH Zurich Gender Monitoring Report (Schubert et al., 2019) showed that there are very few female Spin-off founders: On average less than 10% of all founders between 1980 and 2018 at ETH Zurich are female. In 2018 one out of 7 Start-ups associated with the University of Zurich have a female CEO, 1 Start-up has a woman as a co-founder.

The two most recent Swiss Venture Capital Reports come to similar results: In 2017, 5.7% of all Start-ups that attracted risk capital were led by a woman; in 2018, the share had increased significantly to 9.1% (Kyora & Heimann, 2019; Kyora & Heimann, 2020). There was also significant growth in invested capital: in 2017, only about 2% of the total capital went to Start-ups with a female CEO, but almost 7% in 2018 (Kyora, 2019, p.68).

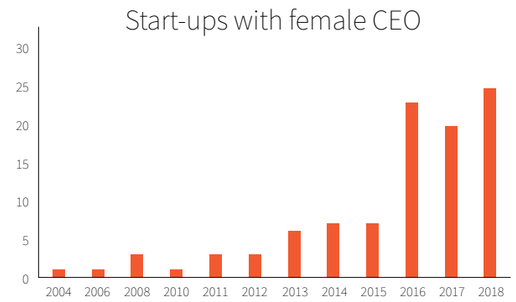

Figure 1: Number of Start-ups female CEOs by founding date (Kyora, 2019, p.68).

These numbers demonstrate the under-representation of women in innovation, Start-ups and on the management floor. However, numbers are increasing! Figure 1 shows the total number of Start–ups with female CEOs in Switzerland (Kyora, 2019).
On top of the bare numbers, reality speaks with a very clear verdict, one also supported by the Boston Consulting Group (Abouzahr et al. 2018). According to their research, businesses founded by women ultimately deliver higher revenue – more than twice as much per dollar invested – than those founded by men, making women-owned companies better investments for financial backers. In its report the Credit Suisse Research Institute (CSRI) reconfirms the clear link that exists between diversity and improved business performance:

With regards to business performance, we find clear evidence that companies with a higher proportion of women in decision-making roles continue to generate higher returns on equity, while running more conservative balance sheets. In fact, where women account for the majority in top management, the businesses show superior sales growth, high cash flow returns on investments and lower leverage.

Dawson et al., 2016 – p.1

This data having been generated from over 3'000 companies stretching across 56 countries and comprising 30'000 executive positions. In the 2019 report, the CSRI states that companies with more diverse management teams have generated sector-adjusted outperformance approaching 4% a year compared to those displaying below the average (Dawson et al., 2019, p. 19).

It therefore makes sense that any effort made towards fostering the participation of women entrepreneurs must clearly strengthen the economy. Woman entrepreneurs are contributing to the social well-being of society, while giving higher priority to organizational and social efficiency, and emphasize internal communication more than their male counterparts. These differences, combined with women's ability to listen, and their experience in striving for harmony within their environments, seem appropriate to the evolving requirements of managers in the 21st century (OECD, 1998).

Being female in a company has a competitive advantage: Therefore, companies as well as Start-ups are looking to have women and are willing to promote them. In the course of the *fem*inno program, all the participating companies, such as Actelion, Lonza or PWC, stated clearly that they support women in business and seek to increase the number of women they have in management positions. Most companies nowadays also provide internal training courses and encourage initiatives focusing on the career development of women.

In 30 years of work experience in leading roles, it became very clear to me that diverse teams perform much better than teams with only men or women.

Klaus Gehmann, technical manager for crop protection, Syngenta

Why are women extremely valuable for mixed innovation teams?

Men and women approach problems differently. Consequently, any person alone can never make the same educated choice compared to that of a diverse team with an open mindset.

It seems that companies with a diverse founding team find it much easier to also attract and retain diverse talent in later growth phases. Pointing this out to founding teams at an early stage can have an enormous positive impact on the development of their business in the long term.

Johanna Seeliger, CEO Diversify

Why do we need more women to become innovators?

An essential part of the discussion about gender differences concerns which differences are fixed in the genetic blueprint and which are driven by cultural exposure. There are behavioral patterns which are associated with men, and others which are associated rather more with women. Each individual develops its own, distinct pattern of more "female" and more "male" characteristics. It seems to be accepted that in a general way, women tend more towards the intuitive side, and men more towards the factual side.

Some of the behavioral traits associated more with women affect the innovation process substantially:

Women tend to have better listening skills: In an environment of listening all individuals from a team are better able to express their views and share their insights. This has an overall inspirational effect on the team. More ideas will be shared, discussed and are available to the team to pick the best solution (Ruigrok et al. 2014; OECD, 1998).

Women often have a better sensing for social cues: Stress, frustration and conflict are part of any team. But they can be reduced by detecting and addressing them earlier. This in turn can lead to a more harmonious team experience and more shared values.

Women generally think more through details: Attention to details will reduce error, failure and resulting frustration. Critical issues are detected and addressed earlier, leading to stress reduction in the team and more focus on delivery (Shambough, 2016).

Women are better at balancing risks: Critical situations, rescue maneuvers and failure will be reduced, helping to keep the project on track, creating more focus for value adding team activities (Ruigrok et al., 2014).

Women build different organizational structures:

Female business owners, as compared to their male counterparts, often have a compelling vision of organization and management, because of their different experience and outlook. This represents a real potential source of innovation in terms of management style, company structure, community service and the use of technology.

Dietrich Hermann, Syngenta

Women are the drivers when it comes to "gendered innovation". There are only a few experts (mostly women) that exist to date in this field.

Gendered Innovations harness the creative power of sex and gender analysis for innovation and discovery. Considering gender, may add a valuable dimension to research and adds value to business by developing new ideas, patents, and technology and may take research in new directions.

Londa Schiebinger, University of Stanford

Perez (2019) points out all the various ways the world has not been designed for women. Most women in the program have never even heard about gendered innovation when entering the program. Have you? We asked Carole Clair from the University of Lausanne, who has been our expert for gendered innovation in *fem*inno why this topic is scarcely known, even in academia:

I guess that gender issues have been a blind spot because most research has been done by men. The research being andro-centered, they have neglected gender issues because female gender was most of the time considered as a "variation to the norm". The fact that in the 70s the feminist movement brought gender to the front scene may also have contributed to the mistrust in gender issues. Most scientists are not interested or are maybe even afraid of gender because they believe it is activism.

Carole Clair, University of Lausanne

The *fem*inno program put this topic on the agenda to promote awareness and emphasize the huge potential of gendered innovation for future female entrepreneurs when they are scoping out their projects. See chapter 2 for more details.

Women are the largest group of consumers in the world, not only by number but also because they often represent their husband, children or aging parents as well. There are some interesting statistics available about the purchasing power of women. Women make more than 80% of all consumer decisions (Brennan, 2018). That gives them the unique voice of a customers' position. But at the same time this is also a big advantage in many fields of innovation, as they are the expert customers / consumers themselves, with very clear ideas as to what the market expects or needs. Consequently, this is a big advantage when it comes to successfully delivering innovation in the market.

Since women have such an impact on the decision-making process, why are they seldom included in the developmental process of any new product? In this way there is the clear need for a broader set of customer experiences to inspire ideas.

Women do not have a lobby at the critical management levels, simply because they are underrepresented. In times of social media, especially LinkedIn, even CEOs from big companies are just a few words away. The statement that women lack role models and mentors is out-dated but remains a welcomed excuse for women to connect with other women and build a network. Women's groups offer career events, which you can find on an almost daily basis.

Women entering the Start-up business are often reluctant to ask for venture money at critical moments in the early life of their innovation process.

This often puts them at risk of lacking cash flow or slows the speed of their innovation process.

Isabelle Siegrist, CEO and Business Hatcher, Sandborn GmbH

Women are at a disadvantage when it comes to getting support for risk-taking. People tend to perceive that women are more risk averse than men. Stronger, taller, and more attractive people are perceived to be more risk tolerant. Women are not perceived as taking a risk because it is simply not expected from them.
The challenge for women might not be about how to take risks, as they already do so. Instead, it may be making those risks visible and capturing the credit for risk-taking in ways that signal their success to those around them. Given that leaders are expected to take risks, being acknowledged as a risk-taker is essential for a woman's professional growth. Women should enhance their career potential by talking about risk and promoting their accomplishments similar to their male colleagues. Generally, it should be kept in mind that historically risk taking is associated with the allocation of finance, but there are many other aspects in life and work, where taking a risk is not discussed as much (Sundheim, 2013).

With this document, we would like to provide female academics at Swiss universities guidance on how they can master a successful innovation process within their own responsibility and within the given structures. Alternative career paths, such as founding a Start- up, may be an ideal opportunity for women to make use of their numerous skills. Generally, career opportunities for women in leadership have never been better. Indeed they are increasing as illustrated above.

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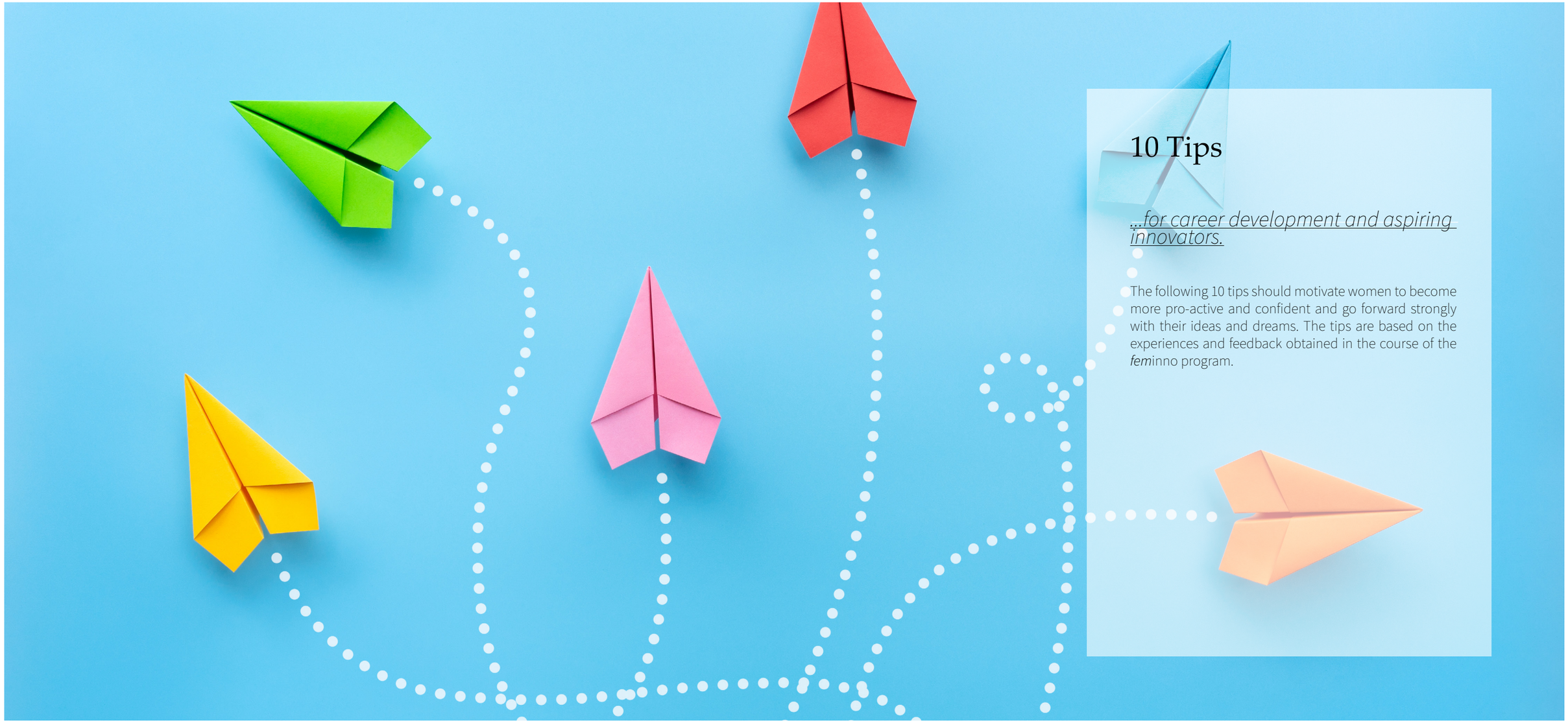

10 Tips

...for career development and aspiring innovators.

The following 10 tips should motivate women to become more pro-active and confident and go forward strongly with their ideas and dreams. The tips are based on the experiences and feedback obtained in the course of the *fem*inno program.

Tip 1

Personality rocks!

Be a role model and a coach for young women, show them what women can do in science, technology, innovation and the management floor. Stay connected among yourselves, share your experience and continue to support each other. Use your power of networking. Continue to build your relations and bring your female qualities into innovation and management. Become visible! Get the credit you deserve for publications, patents, or even ideas! YES, it does matter and it is critical that you do not miss out on opportunities early in your career, which could accelerate your innovation process.

Get in touch with Unitectra or
ETH-transfer for more information.

Tip 2

If you don't play, you cannot win.

Understand that there are different communication systems (especially between men and women). Use both horizontal and vertical communication styles (see Chapter: Negotiation). They are different systems which, when combined constructively, lead to more effective results. Sharpen your perception of the favored forms of expression of the systems. What is the body language like? What is said and how? How do the systems react in conflict situations? Who takes how much space, which contents are transported? Who challenges? Create an awareness of your own communication behavior by reflecting on past experiences, and analyzing situations as they occur. Use this awareness to consider and evaluate both current and future potential conversation situations.

Tip 3

You can learn anything in a short time.

As a scientist you are able to distinguish important from unimportant. Coming out of a PhD, you are a project manager and a problem solver. Often experienced in stakeholder management, you are able to work in a multi-cultural environment. Sell your skills and you will succeed! Certainly, lifelong learning is key but you do not need additional economics, MBA or Project Management courses. They could become key later on during your career. It is not all about content. Apply your expertise and improvise if necessary. You will gain the confidence you need for future challenges. Make yourself seen.

Tip 4

Don't let other people impress you too much.

Naturally people like to talk about what they do best. Reflect on your strengths and your authenticity and move on. More important than what other people have is a strong belief in your own brand and potential contribution.

Tip 5

Creative freedom.

No matter whether you are starting a new job or your own Start-up, you will always have the creative freedom to change your role on the way, choosing something which makes YOU perform the best. Do not hold yourself back in taking opportunities by comparing yourself with the current holder of the role or his/her peers. There is a reason why it is time for a change! There are many structural reasons given for the lack of equal opportunities, but often the limited number of female role models seem to give a false view on potential job opportunities. While popular culture perhaps views leadership as being associated with being more bossy, and therefore with a negative connotation for the empathic women, the truth remains that there are many forms of leadership and there is an overriding drive for change in many organizations. It is also true that some women in leading positions are more of a deterrent than a positive example, but they are not a template that needs to be followed. Do not look to them as a model but instead choose to be the authentic leader of your choice.

Tip 6

Operational vs strategic roles.

In society we see that women are hesitant to promote their own ideas or move to top management positions because they are reluctant to move out of their comfort zones. The result is a vacuum where others make the decisions, which will impact how YOU will work now and in the future! It is an opportunity for you to be the change, besides, being strategic in your decision-making is a must in every aspect of your life and has nothing to do with being an unappealing opportunist taking advantage of people. Remember: You can only grow when you go out of your comfort zone!

Tip 7

Money talks!

Women are strong in social innovation but are hesitant to demand money and resources for their ideas. Thus, the chances of having success to mature ideas is hampered. Making money is a must for a successful innovation process, and this needs to be understood when entering the innovation ecosystem. It is not wrong to make money and determining your own personal ‘money story’ can be an enlightening experience, and one that once addressed can help release more resources.

Tip 8

A network of women is most effective in achieving.

Many women still believe that it is a sign of weakness to associate with other women and join women specific networks. Luckily, this is slowly changing and the importance of these initiatives becomes visible. Many women feel that networking is equal to opportunistic behavior and is therefore unfair competition. But building a network is simply the way of working in the 21st century, similar to Smartphones and Laptops. The number of women in management positions is rising only slowly, and the most important barrier is perceived as the lack of social networks that facilitate advancement to the management level. Network with people in positions of power and authority! It is important to establish advocates in work environments. Not just having mentors, coaches, stakeholders and active networks, but people who are actively looking for ways to promote you and your brand. Seek diversity in your private and professional environment (e.g. through aperos and conferences). In addition: Information is power! Seek lateral communication and share your experiences and success in your network, make your good practice highly visible. You gain, but so does your network!

Tip 9

Practice idea generation.

Participate in innovation challenges, there are numerous 'free of charge' organizations that offer courses, mentoring and network opportunities. Besides taking advantage of these, also share your ideas with your family and friends. Find collaboration! Be flexible and find opportunities to get involved in a successful innovation, especially if you do not have your own idea. Your idea may still come in the future especially given the right environment to germinate. Start-ups in your vicinity are generally open for volunteer work, internships or even permanent positions. You can also find support in your academic environment: University of Basel Innovation; ETH Zurich Innovation & Entrepreneurship Lab; UZH Innovation Hub. Do note that it is often necessary to demand the space and time to innovate from your professor, which is a critical point if we are to work towards an organizational change.

Tip 10

Stay healthy!

Maintain a work-life balance – only a healthy body is able to perform! This is crucial, though often overlooked, as this enables and is fed by all the above to happen.

Career engagement and preparedness

A guideline to proactively design important career transitions.

Daniela Gunz & Roger Gfroerer
Career Center of University of Zurich

Career preparedness is the ability to make the right career decisions and to move successfully in an individually defined career path. Career preparedness helps to identify and use unplanned positive events that influence a career (Krumboltz, 2009; Hirschi & Valero, 2017). For such a preparedness to be developed, career commitment is necessary, meaning dealing with career topics during the doctorate or postdoctoral period. Due to the variety of possible job roles when leaving academia, a simple structuring of the fields of action, based on the career adaptability approach (Savickas, 2005), has proved helpful in consultations and workshop and was included in the *fem*inno career retreat (figure 2).

A Personal Development Plan can be used as a steering instrument across all fields. It provides certain activities in all fields and gives an overview on commitment to be or already achieved. In addition, findings and information are summarized and can be discussed and evaluated with mentors, supervisors and others.

Know Yourself

The field of “Know Yourself” is based on the idea that people gain control over their career decisions as their self-knowledge increases. Observations have shown that doctoral students and postdocs have difficulties in describing their academic resources and transferring them into an application contexts. In addition, values and goals in a future career are often not reflected upon and personal networks do not receive the attention they could play in new non-academic labor market.

Opportunities

The second field of “Opportunities”, assumes that curiosity and the joy of discovery of different opportunities for further career development improve orientation for the next step in the career path. Observations show that doctoral students and postdocs often lack knowledge about academic and non-academic labor markets.

Tools

The third field of “Tools” is based on the assumption that people are confident about their career development when they are sure they have the necessary instruments to apply for a position.

Plan

The fourth field of “Plan”, is based on the requirement that doctoral students and postdocs should actively take care of their careers. In view of the (often limited) duration of employment of a doctoral student or postdoc and the time required for successful applications for a new position, appropriate transfer processes should be initiated early enough, while still employed at academia. It is often observed that the career planning is postponed in favor of completion of research with the consequence that the search efforts extend beyond the end of the temporary employment at academia.

Figure 2: Fields of action of career engagement (Gfrörer, 2016).

T-Shaped Skills to broaden the applicability of academic competencies

The problem of focusing on research activities and competencies has been accentuated in recent years in academia by the increasing focus on cutting-edge research and the associated research specialization, unfortunately at the expense of the development of general career resources of doctoral students and postdocs. The T-Shaped Skills Model (Hansen & von Oetinger, 2001) provides a framework for the development of scientific competencies, supplemented with additional transferable competencies. Translated, this means that doctoral students should acquire additional competences (= those that allow the transfer of specialist competences) and system knowledge outside research or academia and combine these with transferable skills in order to be able to bring use their specialist expertise in a future job.

T-shaped skills can be acquired and promoted through a variety of opportunities that differ from the usual academic to-dos during a PhD or postdoc. The big challenge is to incentivize these activities that may lie rather outside the PhD or postdoc curriculum in such a way that doctoral students and their supervisors take them seriously. In order to obtain recognition within the university, the value of these achievements should be visibly increased.

The following three options have been implemented at the University of Zurich.

- Promotion of extracurricular activities through support structures and incentives. The Impulse Workshop of the University of Zurich supports student initiatives with advice, resources and PR activities; the UZH Graduate Campus supports doctoral students in organizing interdisciplinary conferences.
- Teaching performance: Recognition and promotion of teaching achievements: The certificate course Teaching Skills and the CAS University Didactics of the University of Zurich based on it guarantee the quality assurance of doctoral teaching. However, the possibilities for teaching at the university depend on the chair, institute and faculty. Teaching can also be provided at other institutions of tertiary education.
- Innovation and Entrepreneurship: Through the increased promotion of innovation and entrepreneurship, framework conditions are created for doctoral students and postdocs to be able to move in different contexts (UZH Innovation, Bio-Entrepreneurship, Digital Society Initiative, Unitectra, *fem*inno etc.). External resources are used to ensure success through the supplementary course offerings of business tools and through partnerships with incubators and hubs.

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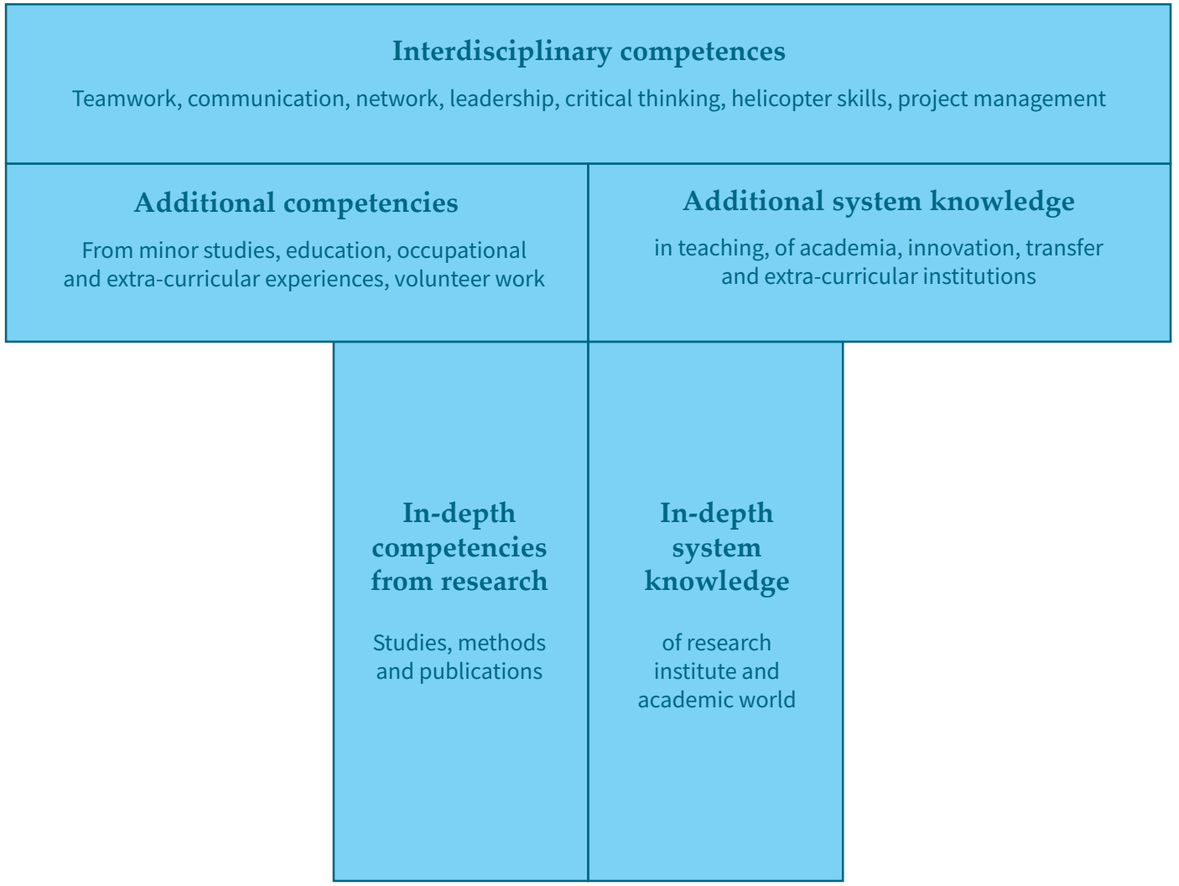

Figure 3: Development fields of the T-Shaped Skills. Representation according to Spohrer in https://careeredge.bentley.edu/blog/2015/04/21/how-gaining-t-shaped-skills-will-give-you-an-edge/

Personal Development Action Plan

Prioritizes competencies that you will need in your short-term, medium-term or long-term development. Be realistic: 3 priorities might be enough in the short-term perspective. **How will you further develop these competencies or skills?** Specify your next steps: use the **SMART- formula** to define your goals (*Specific, Measurable, Action-oriented, Realistic, and Time-oriented*). What exactly do you need to improve or achieve the respective competencies / skills? For example, define your training schedule (*I will visit the following courses, by when to learn about the following learning objectives*) or networking plans (*I will establish 3 new contacts in the area of … by visiting the following conferences / building up collaboration to …/ ask my mentor to introduce me …(done by MM/YYYY)*). **Match your progress regularly through self-assessment.**

Challenges, questions that I wish to address, goals that I wish to achieve.	**Ideas, suggestions** collected during the coaching sessions / programs	**Procedures, steps** undertaken	**Progress self-assessment**	**Interim evaluation** Date: Comments:	**Final evaluation** Date: Comments:
			Start 1 5 10 *Interim* 1 5 10 *Final* 1 5 10		
			Start 1 5 10 *Interim* 1 5 10 *Final* 1 5 10		
			Start 1 5 10 *Interim* 1 5 10 *Final* 1 5 10		

Why negotiation is your key

...in starting innovation from the academic lab.

Carl Emerson
Insideout Solutions, Basel

The fact that negotiation is so endemic is perhaps one of the reasons why it is also often so invisible. Every interaction in life could perhaps be described as a negotiation: whether it is who merges in front of who in traffic, the first to be there at a check out lane in the supermarket or whether you and your partner choose to eat at the Italian on the corner or the Indian restaurant down the street. After all: a negotiation is basically a communication situation in which at least one partner is trying to reach a concrete, specified goal. But these are not recognised as negotiations, and this is part of the problem.

At the other end of the spectrum are the big numbers that are more popularly labelled as negotiations: who wins in big business mergers and takeovers, how to establish the right new job salary in interview discussions; or looking at resolving complex work situation conflicts. And while these are the more high profile situations, there are some vital invisible ones in between.

Key, in this document, is the context of innovation. As the Delphi study shows in the paragraph around 'Who owns the innovation?' we see that: "In general, these questions are important for innovators in the academic context of both genders, however, female academic innovators might be especially vulnerable because implicit stereotypes make it less likely that they will engage in negotiations about these matters". The trouble can be that because some female innovators do not recognise the level of endemic negotiations in life, and since they are not (yet) involved in the big numbers negotiations, then they do not see the negotiations in between nor feel the need to engage and learn to be prepared. If you do not see, you do not engage. And, if you do not play, you cannot win.

Having strong negotiation skills allows you to establish what is your current baseline from which you position your new development. And, failing to negotiate can lead to the failure of the innovation, loss of the asset, or in its simpler form, loss of realised value from it.

As stated above, there are implicit stereotypes but also cultural obstacles to overcome: Studies have shown that women tend to get penalized if they negotiate hard about salary, work load, resources or incentives (Sandberg, 2013).

Among the kind of obstacles that women need to overcome in negotiating are (Amanatullah & Morris, 2010):

- The fear of backlash – women, reported believing they might be punished if they were perceived as too "pushy" or "demanding".
- A self-protective strategy – because of the fear of backlash, women who bargained on their own behalf opened with significantly lower counteroffers than men or even women who negotiated on behalf of a friend.
- Or handling the negotiation at an inappropriate pace (Shonk, 2020). The kind of stereotypes often seen portray women as having a communal nurturing nature (Kolb, 2013) and so are inappropriate to show any assertiveness or push through with demands.
- They are seen as being pushy and demanding if they negotiate the same way as their male counterparts. Should women be cooperative to conform to patterns? Or be non-cooperative (Kray, 2004)?

From a cultural perspective, there is obviously a huge disparity in the rights of women in different countries across the world, but even in the 'enlightened' west there are shadows of the times when women were the stay-at-home caregivers. This is even evident in Switzerland (Kohler, 2019).
The female academic innovator needs to know at least two things:

- The current best thinking on negotiation skills and process, and
- The environment set by culture in which these negotiations occur.

This was something addressed in the *fem*inno program, with a training course on negotiation skills coupled with leadership skills. The participants were taught how to improve their negotiating skills in professional environments as well as in private conflict situations for fair resources, salaries etc. While salaries are often seen as the negotiation point, resources has to be taken seriously (Tinsley et al., 2009).

Negotiations happen around project leadership, funding for travel and conferences, who gets additional staff in the team, the desk by the window, the role as a mentor for the intern etc. Practical negotiation theory is more effective when it is accompanied with softer matters such as how to strengthen leadership skills, recognizing and consolidating ones own leadership style.

The best negotiation process

According to the Harvard Negotiation Project (Fisher, 1991), there are a number of critical negotiation steps necessary to learn to safeguard ones innovation:
Perhaps unnoticed as the primary stage is a surprising starting point- it is all to do with relationship. Critical is establishing who are the key parties, performing an appropriate stakeholder analysis and carrying out a quality assessment. This is foundational and continues throughout the negotiation. Relationships help convey messages.

When it comes to the messages, step two is all about communication: who needs to know what and when do they need to know, how is it possible to best establish the right level of engagement. This step is particularly linked to the importance of recognizing that there is a negotiation, that it is important, relevant and, even more so, that it is possible to be successful in it! Negotiation is the key to open opportunities, but if you do not have the key, see the need for a key, or use the key, the door will remain locked.

The Harvard Negotiation Project was a primary force in communicating that positional negotiations are not optimal. I say 10 you say 20, we hold our positions, and maybe compromise, but behind the position, the number, there is an interest. And that interest rather than position can be surprising and, if identified correctly, can lead to a solution that is more than win-win.

Something extra could be on the table that was previously invisible and could be a better outcome for everyone. So, it is important to discover what the interests are for each of the relevant stakeholders.

Having understood what is important for everyone by investigating the interests then it is possible to start to create a variety of options: looking to generate lots of pathways forward that could meet the interests of everyone without buying into any of them too soon. It is just multiplying potential solutions.

These solutions can then be tested for legitimacy: ensuring anything selected is legal, defendable and long lasting and meets the interests clearly.
Moving to the final 2 stages, often overlooked is the need for a BATNA – the Best Alternative to a Negotiated Agreement. Alternatives are all about having a back up plan to know what options you have if the negotiation fails. You will be successful if your negotiation is better than your BATNA, and hence having a strong BATNA raises the possibility of a successful negotiation.

Finally it is important to be clear on the commitment: Ensuring that it is transparent what the outcome is and that this is a robust agreement with full buy in from all parties.

The environment

As already stated women can be penalized if they negotiate while men doing the same thing do not. So it is important to recognize the social environment. Women are hesitant to get into the necessary networking activities or to be pro-active in collaboration as opposed to men.

Societal norms:

- Men show leadership, while women can be called bossy.
- Men can speak up, but women can be shouty.
- He is angry, she is crazy.
- He is assertive, she is bitchy.
- He is direct, she is abrasive.

The list could go on, and while we cannot expect the whole of society to change overnight, we can continue to push for a fair approach and draw attention to the disparities while at the same time finding ways to function through some inherent differences native to gender. One aspect here is to assess the normal gender-relevant communication systems, we find that there is an emphasis between gender towards a vertical or a horizontal style (Tannen, 1994, Modler, 2018).

Vertical communication system

Here social communication behavior is defined by the assignment of rank and territory.

Key questions about the rank:

- Who is the boss, who is number 1?
- Whose boss, superior am I?
- Is the ranking / hierarchy correct (still)?
- Principle: demarcation / rivalry

Territory indicators:

- Office size / location
- Space provided by personal items on the surfaces (desk, meeting table)
- Taking up space through posture, movement
- Speech components (monologues, interruptions)
- Amount of information, ideas, awards, records, etc.
- Property notifications (MY) are object and person-related

In social situations, the necessary hierarchy must first be established. Once this has been established, the system relaxes and topics can be worked on in terms of content. However, this is not a stable order, but is repeatedly tested, possibly in a weakened form. The range of events shows facets from playful / humorous to aggressively provocative.

Horizontal communication system

Here social communication behavior is based on the criteria of belonging and content.

Key questions about belonging:

- To whom / to which group do I belong?
- What do we have in common?
- What connects us?
- What information do we share?
- How do we relate to each other?
- Principle: connection / harmony

Content criteria:

- Who, what, how, when, why, for what, with what, with what ...?
- Details, analyzes of facts
- What do I know about / about xy?

In this system, you can quickly work on content-related issues. This creates connection, closeness and community. If the basis is reliable, controversial attitudes are expressed verbally, taking care not to exclude any group member. The system experiences stress when a group member sets themself apart, stands out from the group, occupies a special position and competes openly. These are not absolute facts, but simply communication models that are intended to make complex mechanisms easier to understand. They focus on the primary essential features.
If you don't play, you cannot win. Understand that there are different communication systems and we can see horizontal and vertical communication as a tool for successful communication. The different systems, when combined constructively, can lead to effective results if we choose to sharpen our perception for the forms of expression of the systems. What is my body language like, and that of my negotiation counterpart? What is said and how? How do the systems react in conflict situations? Who takes how much space? Who challenges?

We can learn to assess per situation whether horizontal or vertical communication is appropriate, and we need both so that we can use both. If women are always assumed to be horizontal communicators, then their options and flexibility are constrained, the art of being successful is to have lots of approaches, to flex them and sometimes do the unexpected. Being aware of ones' own communication behaviour; reflecting on past experiences, and analyzing situations is important. To consider and evaluate both the current and the future conversation situations, including horizontal and vertical communication.

It is not productive to negotiate horizontally with content and connection examples when dealing with a vertical person who only hears hierarchy and territory: This person will not even recognize a case

is being made for a negotiated outcome, so the approach needs to be tailored to the audience. But the counterpart is also true, and pushing a vertical style to a horizontal senior person could be interpreted as inappropriately aggressive.

The vertical communication system tends to be associated with men, the horizontal to women. Neither of the two communication systems is better or worse than the other. Knowing them and acting consciously in one or the other system, depending on the situation, can make a decisive contribution to better communication.

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Negotiation Preparation Checklist

Shonk, K. (2019)

1. What do I want from this negotiation? Short-term and long-term
2. What are my strengths – values, skills, and assets – in this negotiation?
3. What are my weaknesses and vulnerabilities in this negotiation?
4. What lessons can I apply from past negotiations to improve my performance?
5. Where and when should the negotiation take place?
6. How long should talks last? What deadlines are we facing?
7. What are my interests in the upcoming negotiation? How do they rank in importance?
8. What is my best alternative to a negotiated agreement, or BATNA? That is, what option would I turn to if I'm not satisfied with the deal we negotiate or if we reach an impasse? How can I strengthen my BATNA?
9. What is my reservation point – my point between a deal and no deal?
10. What is my aspiration point in the negotiation – the ambitious, but not outrageous, goal that I'd like to reach?
11. What are the other side's interests? How important might each issue be to them?
12. What do I think their reservation point and BATNA may be? How can I find out more?
13. What does their BATNA mean in terms of their willingness to do a deal with me? Who has more power to walk away?
14. What is my relationship history with the other party? How might our past relationship affect current talks?
15. Are there cultural differences that we should prepare for?
16. In what order should I approach various parties on the other side?
17. What is the hierarchy within the other side's team? What patterns of influence / potential tensions? How might these internal dynamics affect talks?
18. What potential ethical pitfalls should we keep in mind during the negotiation?
19. What objective benchmarks, criteria, and precedents will support my preferred position?
20. Who should be on my negotiating team? Who should be our spokesperson? What specific responsibilities should each team member have?
21. Do we need to involve any third parties (agents, lawyers, mediators, interpreters)?
22. What authority do I have (or does our team have) to make firm commitments?
23. If we disagree about how the future plays out, can we explore a contingency contract, and stipulate what will happen if each side's prediction comes true?
24. What parties not yet involved in the negotiation might also value an agreement?
25. Have I practiced communicating my message to the other side? How are they likely to respond?

Best practice for a good life balance

What are possible solutions to challenging situations which arise when managing a family as well as a career?



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Having children or starting a family is a challenging period in everyone's life. Priorities shift and typically your everyday life has to be reorganized. Managing a family and promoting one's career simultaneously requires great devotion of time and energy. The following concrete tips for a woman's career as well as for her private life may contribute to a good (or better) life balance. Both – family and work – are considered to be meaningful components of one's life. This is why it is preferred to talk about life balance instead of work-life balance, which could be interpreted as "work is no life".

The subsequent good practices have been elaborated within the workshop series "Who Cares? Taking care of your family, your scientific career and yourself" by the Office for Gender Equality and Diversity, UZH and the Department of Psychology, UZH. Young scientists with children and a diverse group of professors exchanged their opinions and experiences on the challenging and high-level demands of a career on one side and a healthy family life on the other.

Best practice at institutional level

- Let your superiors know in good time that you will become a parent, and about any unpaid parental leave that you would like to take. At the same time discuss all the relevant aspects of your return to work (see also the following two points). Write a protocol about your agreements.

- If you wish to shorten your working hours remember that formally reducing your workload may mean that you earn less, but that you still find yourself working your old hours. Talk to your superior in advance about the hours you plan to work, and about organizing a potential substitute – then review your plan regularly to see if it is working. Otherwise, speak to your superior again.

Information on maternity leave

At the ETH Zurich you are entitled to 4 months of maternity leave. If both parents work in the ETH domain, they may divide the four months of maternity leave between them, with the father being entitled to a maximum of two months. If you would like to extend your maternity or paternity leave, you can discuss this possibility with your superior as long as you are on an employment contract which is not under notice of termination. This extension can be taken as holidays, compensation or unpaid leave. Insurance cover changes during periods of unpaid leave.

At the University of Zurich female employees are entitled to 16 weeks paid maternity leave beginning at the earliest two weeks before the baby's due date. During maternity leave, the full salary is paid regardless of the individual employment modalities (monthly or hourly salary, full or part-time work). Employees also have the option of applying for unpaid leave for the period following paid maternity leave (§ 96 para 4 VVO). Pursuant to § 92 VVO, such leave is to be granted if business operations permit an extended absence. Paid paternity leave is five working days (§ 85c VVO); in addition, new fathers are entitled to one month of unpaid leave in the first year of the child's life. When arranging leave, the employee is required to show consideration for the business circumstances at hand. Additional leave may be granted if business operations permit (§92 VVO).

At the University of Basel mothers are entitled to 16 weeks of paid leave. The employee of the University of Basel is entitled to full pay for the entire duration of the paid leave of absence. The University of Basel allows five days of paternity leave upon the birth of the father's own child. Furthermore, the university offers parental leave at adoption as well as unpaid parental leave of absence lasting no more than 16 weeks, which can be extended by mutual agreement.

Should you state time out for parenthood / childcare visibly in your CV and in job interviews?

- Parenthood should be taken for granted in the course of an (academic) career, and should no longer be seen as negative.
- A job interview is supposed to focus exclusively on your (academic) qualifications, your soft-skills and your personality. However, women might still get asked about their family background. In this case consider mentioning your family-related time management skills as a positive argument and pointing out your high commitment to stay in academia.

Be visible at events

- Try to remain in contact with your colleagues and peers in your division while you are on parental leave.
- By being supported by a broad social network, you should attend important appointments and events within your organization/division as regularly as possible during and after your maternity or paternity leave. Make sure that, at some point, you also attend semi-social events like a dinner with invited guests, so that you are not overlooked.
- Create professional networks by staying for post-event drinks, so people know that you are around.
- Agree with your superior about ways and options that work for both sides to take part in such events (e.g. which days and what times you are available because you have childcare). If necessary, politely remind them of the options that you have discussed.
- Ask the person who is organizing an event to choose a venue with good transport connections to save you time. This would anyhow be appreciated by most guests.

Grant applications and the (academic) age

Some organizations to which you can apply for a grant assume a certain period of childcare for each child, and deduct this from your academic age. There is certainly room for improvement here, but these days in most cases, time spent caring for children is taken into account.

If the eligibility to apply to the **Swiss National Foundation** is limited to a specific period, this period may be extended at the applicant's request. Applicants must explain their reasons for applying for an extension to the SNSF. Maternity (pursuant to paragraph 4) and, in particular, the following reasons for delays are acceptable: paternity, adoption or parental leave; […]; care duties; […].

www.snf.ch/en/funding/documents-downloads/Pages/regulations-general-implementation-regulations.aspx

The **Suslowa Postdoc Fellowship** of UZH enables a postdoctoral researcher to return to their academic career after a career break or a delay in research activities due to incompatibility reasons. A time-out for childcare, a longer and more serious illness, the care of elderly or sick relatives or death in the closest family are recognized as incompatibility reasons.

www.research.uzh.ch/en/funding/postdoc/spf.html

Childcare at conferences, short stays, business trips and further education

It may backfire if you often refer to the children to excuse your absence from appointments and events. That doesn't mean that you have to attend every event, but if you would always decline, people might stop asking you to join such events. Negotiate with your co-parent, which events are important for you to attend and how you can arrange to attend. In return, the organization should make an effort to offer family-friendly, rotating meeting and event times.
Additionally, there are opportunities to get financial support for childcare during attendance at a conference, to complete a short research stay abroad or to go on a specific business trip or for further education if this results in extra costs for childcare. For example, the **Robert-Gnehm-funding** for applicants with preschool children (up to kindergarten entrance) with parents employed or studying at ETH Zurich.

Flexibility grants are aimed at postdocs and doctoral students who have to look after children at an important stage in their career and are therefore in need of more flexibility. You are eligible for this grant when you are employed within an **SNSF project including BRIDGE grants**. The Flexibility Grant offers researchers two options to balance their professional and private lives: on the one hand, it can provide funding to help cover the external child care costs charged to the researcher. On the other hand, it can be used to help finance the salary of a support person, allowing the grantee to reduce his/her work quota. The two measures can also be combined.

How do I organize my workload?

- When are you most productive? Some people prefer to work in the morning, others in the evening. Set your priorities and working hours accordingly. Handle major, important tasks during your most productive periods.
- Try to negotiate with you co-parent and superiors/colleagues longer stretches of uninterrupted work time, ideally during these periods.
- When this is not possible, think of projects in terms of jigsaw pieces (if possible), and don't wait until you go all other things out of the way so that you can have a large block of several hours to work on important tasks – because that time might never come. Make the most of every free half hour. Get down to work as soon as the children are asleep, rather than doing the housework first, for example.
- Don't expect to take care of your children and get work done in parallel when you're looking after your (especially younger) children.
- Once you have used up a window of time and are finished, update the current status of your work for yourself in a journal or other document: summarize how things stand and list the next jobs that you have to do, including reminders of where you can find information and materials. That way, next time you have a window, you won't have to backtrack and will know exactly what point you reached last time, and where you have to pick your work up again now. With this in mind, your journal entry would not simply read "Continue writing article", but would be broken down into "Open mail from XY and extract literature references; produce chart; sketch is stored in folder Z". Although this approach means spending a little more time on documenting progress before you stop work at the end of a phase, it does mean that you can get back into the subject faster the next time, and you are less likely to put off major tasks.
- If you are in a relationship, sit down with your partner regularly and align what is coming up over the next week and next month, etc. Do this once a week or at intervals which suit you.
- Coordinate in advance, if possible, what you will do if your appointments clash with those of your partner. One option here might be the "first come, first served" approach, meaning that whoever made the earlier entry in the (Google) calendar will go to her/ his appointment, while the other parent takes a back seat and, e.g. picks up the kids from daycare.
- Get support with the tasks that you don't like, and delegate. For example, you could invest in a cleaner. They wouldn't even have to come every week, but maybe every second one. If necessary, discuss with your partner that this financial investment will pay off by giving you both more time for work, family and to relax – and potentially also less reason to argue.
- Discuss with your partner whether structured family time might work for your family (or if you would prefer to keep things spontaneous). For example, you might decide that as a matter of principle you will attend at most one evening event per week, which you would then choose carefully, or that you will attend only one international conference per month/quarter/half-year, which would also be selected carefully. Alternatively, you might make each Saturday or Sunday a family day, on which you all go out and do something together. Fixed principles and schedules help cut down discussions, simplify organizational tasks and create clarity.

How do I make sure that I still manage to relax?

- Think about what you need in order to feel well.
- Deliberately make time for it in your schedule, by making a date with yourself. You don't have to tell anyone else what it is. Just say that you have an appointment and aren't available. Approach this in the context of your relationship, as your partner is naturally entitled to his / her own downtime.
- Lack of sleep may be a problem, because little children wake up frequently during the night, won't settle, or have been sick for a while. In this case, agree with your partner to split the tasks that need to be done in a way that works for you both. You will never catch up on sleep entirely, but you can avoid having to shoulder the heavy burden of childcare on your own. If you are in a relationship plan time as a couple just as regularly as you plan childcare and downtime for yourself.
- Also with older kids, within a relationship, at-home childcare tasks should be divided fairly.
- Often we use childcare times only to work, then rush to pick up the kids, even though they are happily playing at the daycare center. Maybe picking them up twenty minutes later, after you've had a short coffee break for yourself, will make everyone more relaxed.
- Fixed bedtimes for the children, and thus a clearly structured daily routine, will help the children – and you.
- Be clear with yourself that you cannot do everything in the same time and to the same standard as someone who does not have children. Look at the situation and ask yourself what you can do at this very moment and which are your specific personal priorities. Then take care of these first.

Be careful to avoid "gate-keeping"

This means acting as though you know better than your partner how different aspects of childcare should be done, and taking them back upon yourself as a result – thereby increasing the burden again. Accept that your co-parent does things differently, and let them get on with it. Both parents should be committed and take over their individual responsibilities. Raising a child should be considered as teamwork.

How do I deal with negative comments?

- You don't have to respond to criticism about your family and career choices. Defending your way of life costs too much energy. You're better off investing this energy in your career, family or elsewhere.
- If you realize comments from certain people – including members of your own or your partner's family – are criticizing your family model and are pulling you down, it is perfectly legitimate to spend less time with them. If you have a chance to talk to other working parents, you may feel much more understood and supported.

My partner isn't keeping his / her side of the bargain – what should I do?

Equal opportunity parenting means working together as a team and being reliable to one another. So:

- Before you start a family, discuss your values and attitudes, in addition to how you believe parenting should work in practice (e.g. your attitudes towards out-of-family child care), and how your careers might develop. Often, couples only discover after their child is born that they have conflicting attitudes, leading both parents to fall back into traditional roles. It is impossible to plan and consider every detail regarding everyday life with a child / with children in advance, but you need to discuss and agree on a common ground.
- Remember, however, that while you can do a great deal of advance planning, once the child is born, the situation is likely to be different to the way you had imagined. For example, you might be looking forward to being at home with your child, but find after a few weeks or months that you feel trapped and frustrated. As a backup, develop a plan B with your partner in advance, and revise both your opinions regularly in the light of real-life experiences and feelings – even if that means reworking your original agreements and plans.

Outside assistance

If communication has become difficult because of your differences, get professional help via parental support services (often offered through your local family / community center), coaching, or counselling with the Fachstelle UND organization.

Fachstelle UND knows how to combine work, household, family and volunteer work. Let yourself be inspired, discover your scope, try new steps. They support men and women in the private and professional everyday organization and in the realization of their desired partnership-based division of labor.

www.fachstelle-und.ch/privatpersonen/beratung/

My / our family lives abroad / I'm a single parent. We / I have no family support with childcare. How do we / I solve the childcare topic?

- Build up and expand your social network (reliable neighbours or friends for example).
- Ideally, your network should include people who are also able to sometimes help during the day, if a child is ill, for example, so that you will still be able to keep important appointments .
- If both parents are available, divide childcare equally if your child is ill. This may involve several days or even weeks, especially in the first few years of pre-school and school. One way of organizing yourself may be to mark extremely important dates (such as key presentations) in your calendar, and agreeing that the co-parent must not enter an equally important appointment in parallel. Then, if children have to stay at home, it is easier to decide who will stay with them.
- In individual cases, regional networks enable you to get in touch with seniors wishing to take on the role of substitute grandparent . This could be an option to consider, if you seek more support and your usual caregivers are not available.
- Find other babysitting services, which are often provided by neighborhood organizations, or churches.
- Set up a shared household or baby room – mate arrangement with other parents or parents-to-be, so that you can support each other with childcare. Depending on the character and age of your children, they may not be willing to stay with a stranger when you really need them to. This could increase your own stress levels. Therefore, your planned "emergency" carers should look after the children regularly, even without any pressing appointments. If this results in costs, incurred by babysitters, for example, it can still be an important and worthwhile investment.

Additional offers by the UZH Offices for Gender Equality and Diversity

A **web portal** that offers all the necessary information regarding life balance and family issues.

www.families.uzh.ch

Several **fact sheets** useful when becoming a parent.

www.families.uzh.ch/en/leitbilder.html

Offer of **general counseling** regarding life balance issues and primarily supports women in situations of assumed discrimination (e.g. because of pregnancy, parenthood or research integrity) and supports women individually within workshops like "Who Cares?" and our annual postdoc workshop series.

My partner / co-parent has been offered a job in a different city / country and there doesn't seem to be an opportunity for me at the moment. What should we do?

- It can help to sort everyone's feelings, needs and options by sketching a scenario for the best possible case, e.g. one parent goes to the new city (with or without the children) for one year, while the second parent looks for a job in the same city and follows on – or one parent goes to the new city/ abroad alone for what is determined in advance to be a limited period, and then returns to their old home, and a second scenario in case the first scenario doesn't work out. Agree also on the maximum time span you are prepared to wait to arrive at the solution you want before the plan has to be renegotiated.
- Talk to your partner about taking turns with your career moves, meaning that it is parent 1's turn to take the current new job opportunity, but the next career move belongs to parent 2, while the other parent takes second place, etc.

Childcare services at Swiss universities

Request financial assistance for a baby's nursery place.

ETH Zurich
Hello Kids! is ETH Zurich's service point for childcare. Parents(-to-be) can take advantage of the free consultations on offer and seek help with finding suitable childcare solutions. If your baby is being looked after by someone who is not a family member, you can request a refund of the additional costs from Hello Kids!

www.ethz.ch/hellokids

University of Zurich
All necessary information including childcare:

www.families.uzh.ch

University of Basel
The webpage Family Services present the current services on offer for balancing studies, career and family at the University of Basel. For information and advice, the Diversity Office will be happy to assist you:

www.unibas.ch/en/Staff/Family-Health/Family-Services.html

How to apply the Business Canvas

Why it is important to engage in ideation under a gender-sensitive perspective?

Isabelle Siegrist, Sandborn GmbH

An innovation project starts with a spark, an aha-moment – but how does one arrive at this moment of epiphany and what happens after that and what role does gender take in it? In this chapter the innovation steps from business idea generation to market validation will be discussed from a gender sensitive viewpoint.

What's a business model?

Though research around the business model constructs is still evolving, academics have a general consensus that a business model describes the basic logic of how a firm "does business" (Teece, 2010; Zott et al., 2011). This includes the fact that the business model basically describes how economic value is 1) created and 2) appropriated (e.g. Zott & Amit, 2007, Chesbrough 2007; Zott et al., 2011).

There are different business model frameworks that can be found in literature. In the Swiss entrepreneurial community the following three models are most commonly used:

- **Business Model Canvas** by Osterwalter & Pigneur (2010): *www.strategyzer.com*
- **Business Model Navigator** by Gassmann et al. (2014): *www.bmilab.com*
- **Lean Canvas** by Maurya (2012): *www.leanstack.com*

Today an entrepreneur is not expected to write a long business plan. It is sufficient to write their plan in a business model framework and develop their business more precisely as they go.

In the practical part of this guide the business canvas from Maurya (2012), which is a slight adoption from Osterwalder & Pigneur (2010) framework, will be used. It provides guidance for entrepreneurs not only how to map out a business idea but also how to validate it and bring it to market and monitor it during running a business. Gassmann et al. (2014) business model framework is simpler yet provides an interesting insight, that through the recombination of business models new ones can be created.

The following elements make up the business model described by Maurya (2012) as the lean canvas:

Problem
The problem or also challenge is the issue that the entrepreneur has identified to solve.

Customer
Customers are the people that use, consume, buy and pay for the product or service offered. The person buying, paying and consuming the product / service can be different.

Unique Value Proposition
This is the what Maurya (2012) calls "Why you are different and worth getting attention." Is what makes the company stand out in the perspective of a customer.

Solution
The solution describes how the problems will be addressed and solved.

Channels
Channels describe the path to the customer – meaning how customers are found and over which way they are communicated with.

Revenue Streams
The revenue stream defines how much money will be earned per unit / service sold. It entails not only the price of the product / service put also the logic of how it will be earned such as a percentage of a transaction payment on a platform.

Cost Structure
This element of the business model is where the costs per unit / service (variable costs) are listed as well as the cost that are not dependent on the sold unit / service (fix costs).

Unfair advantage
This is the competitive advantage from the perspective of the business versus it's competition. Common examples of unfair advantage are speed to market, share, brand strength and patents.

What's ideation and why is it important?

Ideation means the capacity for or the act of forming or entertaining ideas. It is a crucial role of the individual entrepreneur, especially in the initial Start-up-phase, to be the nexus for generating ideas, recognizing market spaces and developing innovative businesses. Research has shown that individual entrepreneurs drive significantly the opportunity recognition (Ardichvili et al., 2003), venture vision (Morris et al., 2005), strategy formulation (Baron, 2007) and business model development (Amit & Zott, 2015). Ideation thus becomes the key driver forward in an early Start-ups life and the entrepreneur has the key role to connect the dont's and move forward.

When does ideation take place?

Ideation is at the beginning of developing a business and one normally refers to be part of the Problem / Solution fitting stage. Following stages are reference points in the Start-up development:

- **Problem / Solution Fit:**
  Do you have a problem worth solving?
- **Product / Market Fit:**
  Did you build the something people want?
- **Scale:**
  How do you accelerate growth?

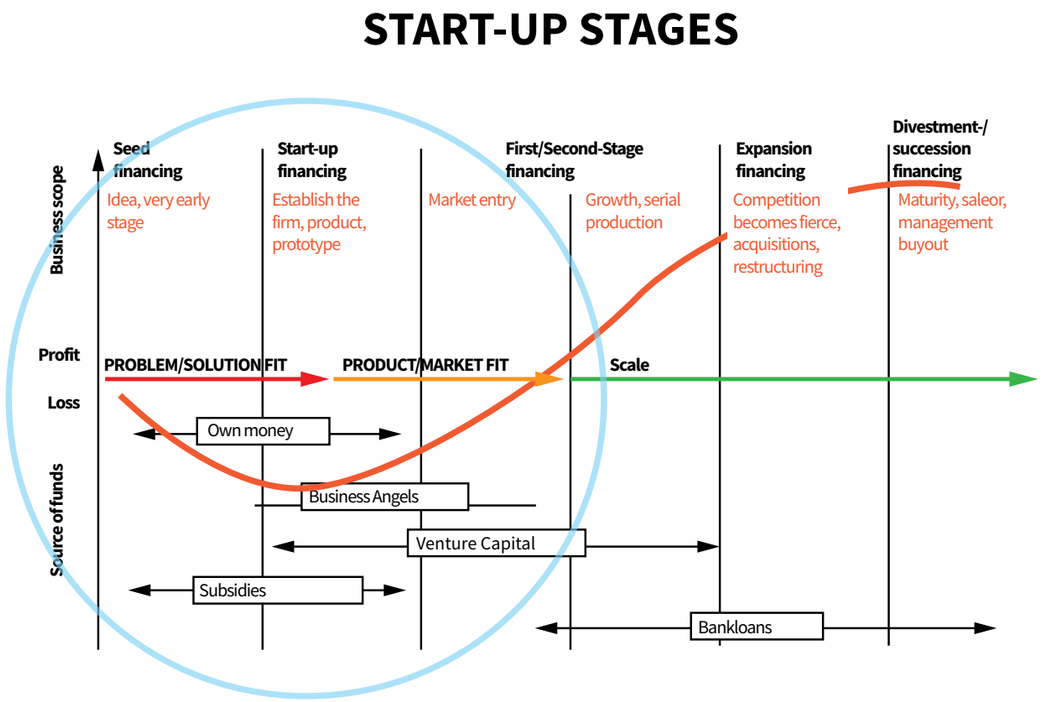

Figure 4: Start-up road map © Sandborn.

What are characteristics of entrepreneurs and are there gender differences?

Entrepreneurs have an above average dynamic way of thinking, balancing both linear (cf. rational, analytic, logical) and nonlinear (cf. creative, intuitive, emotional) factors (Groves et al., 2011). Moreover, entrepreneurs associate business situations with positive attributes such as personal strengths (Palich & Bagby, 1995). Generally speaking, how can variances in entrepreneurial cognition be explained between entrepreneurs themselves? Gender, Experience, Metacognition, Risk Assessment Ability and National / Cultural Heritage have found resonance research so far. Specifically for gender there are differences that help explain the gender gap regarding the start of entrepreneurial endeavors (Langowitz & Minniti, 2007). Shabbir & Di Gregorio (1996) examined the differences between women, depending on whether they were satisfaction or security seekers. Further research determined what business sector women act in (Anna et al., 2000).

Where do we have to be sensitive in the business ideation process?

- **Knowledge base used to determine, develop and market innovation**: When assessing and quantifying market needs, it helps to ensure quality, relevance and applicability of innovation by reducing the risks of gender bias embedded in the knowledge that is being accessed resp. determined (Pollitzer & Schraudner, 2015).
- **People & teams used to drive business ideation process:** Making sure, that different viewpoints are not only addressed through gender free knowledge but also diverse teams driving, developing and supporting the business are important.
- **Markets addressed:** In Switzerland we have a lot of male dominated industries that are being funded and supported in the Start-up ecosystem such as biotech and deep tech. It is also important to reduce the gender risk here and open up to alternative markets such as retail and consumer goods.

Gender-sensitive toolkit & processes for early stage innovation and Start-ups

In the following steps, approaches and tools are recommended based on best practice standers and practices that in use with entrepreneurs to date. This space is constantly developing and neither is there a way to build a business under a “one size fits all” assumption. The following should give practical advice and food for thought and follows along the three first steps of an innovation project:

1. Finding a business idea.
2. Mapping out the business model.
3. Prioritize the business model variations.
4. Testing the business model.
5. Launching a business.

The value of a company will not lie in the idea but in the implementation of the idea. Thus, the focus should not be in the idea but more in the execution of the idea.

Female Founder Tips:

Open up to alternative market & innovation ideas. It could also be a new beauty line such as the success story of www.glossier.com. Also don’t be afraid to start your business alone and try to be self-made, meaning without taking on investors. Look at the great example of Sara Blakely, Founder of Spanx.

1. Finding a business idea

Purpose alignment

Entrepreneurs are recommended to consider if and what they feel passionate about enabling them to have more perseverance, also called grit (Duckworth, 2016). A method introduced by Sinek (2009) can be used where the entrepreneur can simply ask the question “Why?”. A study by Cameron (2018) shows that Americans say female leaders are more purpose driven (56%). This highlights that this alignment of purpose is more natural for women than for men, nevertheless an alignment check of purpose and business idea would be recommended for all entrepreneurs.

Inspiration sources for ideas

To help develop business ideas entrepreneurs can follow global problems and trends. Examples of global problems are UN SDG Goals, or Trend Reports like Euromonitor, or observations of other Start-ups and their ideas over for example TechCrunch.

Follow somebody’s idea

Not having a business idea, is not a problem to start a business as the main challenge of building a business lies in the execution. If this is the case for the aspiring entrepreneurs, it’s recommended they team up with another person who has business idea.

Gender-sensitive idea creation

When determining a business idea, gender sensitive lens can be applied by focusing on inherent problems thus potential business opportunities for women.

Starting on a business idea alone or in a team

Someone's first business partner is just as important if not more important than the idea itself. Research does not give clear answers yet if all-women versus all-male or solo women founded Start-ups have a higher success rate (Box & Segerlind, 2018). Following platforms provide one possibility (earlyhire.ch and cofoundme.org) or one.

2. Mapping out a business model

As recommended a good way to start an entrepreneurial endeavor is to take 15 min to map out a business idea. The best way is to print out the Lean Canvas a few times from Maurya (2012), see figure 5. In a second step the different business model variations can be prioritized. If inspiration for different kinds of business models are needed then Gassmann et al. (2014) business model patterns can provide a valuable source.

The canvas can be filled in following manner:

Define Customers

Is a problem worth solving? If so, the first step is to brainstorm who could the customer or user be: define 2–3 specific and small customer groups.

Tips in defining customers:

- Distinguish between customers and user roles. Customers are those who pay for your products. Users are the one that use it.
- Personify target customers so they are specific and addressable. For example instead of saying one is servicing all single men in Switzerland, a more precise and tangible personification is developed such as “Peter, a stylish retiree living in Thurgau”.
- Split up to broad customer groups into different smaller groups, called customer segments and sketch a lean canvas for every segment.
- Also focus on getting customers that are easy to win as first customers – the first customers are called early adopters (Rogers & Shoemaker, 1971).

List problems per customer group

For each customer segment describe their problems that need to be solved. Also think and list existing alternative meaning how is the customer addressing these problems today. For example if one is hungry for a piece of cake one can bake a cake, go buy a cake in a shop or sit in a coffee and eat one.

Lean Canvas

Problem	Solution	Unique Value Proposition	Unfair Advantage	Customer Segments
Existing Alternatives	**Key Metrics**	*High Level Concept*	**Channels**	*Early Adopter*
Cost Structure			**Revenue Streams**	

Figure 5: Lean Canvas (Maurya, 2012).

2. Mapping out a business model

Define the Unique Value Proposition (UVP)

"Unique Value Proposition: A single, clear message that states why you are different and worth buying" (Blank, 2013).

The Unique Value Proposition [UVP] is a clear message that describes the advantages of what is offered, what makes the company different and distinguishes the business from the competition (Maurya, 2012). A UVP is structured as a sole or few sentences directed to catch the clients attention. The UVP sets the base for all the marketing activity.

Tips on Crafting UVP:

- Be different, but make sure the difference matters to the potential customer.
- Focus on targeting early adopters and grow from this niche.
- Focus on the benefits of the respective product or service and not on the features. For example don't write "professional course for founding a business" but be benefit driven "How to launch your business within a week".
- Pick words carefully and own them – For example Performance stands for BMW, Design for Audi and Prestige for Mercedes Cars.
- As a useful exercise to come up with a UVP you can create a high concept pitch such as describing "Blackbird: The Uber for Planes".

Create Solutions

Based on the identified problems, ideate and define a solution to every problem. List the three most important features for a solution.

2. Mapping out a business model

Think about the Channels

How does one reach customers? Define in what way customer's will be reached (for example offline events, online content) and list the mediums (such as blogs, workshops etc.)

Tips for choosing channels:

- Free versus paid: Focus on channels where through minimum input the maximum outreach can be secured. Early on in building a business opinion leadership can be show cased over expert interviews in media and at events for example.
- Inbound versus outbound: Inbound channels use "pull messaging" to let customers find a new business organically while outbound channels rely on "push messaging" for reaching customers. Example inbound channels: blogs, Search Engine Optimization (SEO), e-books, white papers, webinars. Example outbound channels: Search- Engine Marketing (SEM), print/TV ads, trade shows.
- Direct versus automated selling: As a scalable channel, direct sales only make sense in businesses where the aggregate lifetime value of the customers (meaning how much the customer spends in total during interacting with a business) exceeds the total compensation of a direct salespeople - such as in certain B2B and enterprise products. But as a learning channel, direct sales is one of the most effective since one interacts face-to-face with the customer.
- Direct versus indirect selling: Establish strategic partnership with a larger company can make sense to leverage their channels and credibility. However this should be done not prematurely as most Start-ups don't have negotiation power until they have a bit of traction (meaning actual customers) to show for.
- Retention before referral: Focus on making customer happy as first one needs a product or service worthy of referral.

2. Mapping out a business model

Define your revenue streams and prices

Define the revenue streams and the prices for the offer. The pricing is part of the offer and needs to be designed and tested. Use different business model patterns (Gasmann et al., 2014) as a source for inspiration.

Tips for revenue streams and pricing:

- At this stage it is important if there is a financial viability of the business or not. It is not expected to have a detailed financial plan yet. This detailed plan will develop over time.
- Calculations of revenues can be done in the easiest form by thinking of amount of product / services sold times it's price.
- Time frame: Breaking down the revenues per week or month make it tangible and testable. Also it is important to understand how many products or services need to be sold to make money meaning a profit.
- Start with a single pricing plan: When starting a business, one does not yet have enough information to know how to correctly price or segment the feature set into multiple plans.
- Start with a higher price and then cut it down if needed: It is easier to start at a high price and then drop it down instead of the other way around.
- Price for value and not for cost: Don't price a product or service based on how much it costs in production. Price it based on what the customer is willing to pay for the value provided. Costs and value brining elements are not necessarily correlated. One want's to get the customer at the price point.
- Reference price with competitors as this is the status quo of pricing. Don't be afraid to have a premium pricing to start out.
- Don't undercut your costs: Be aware of how much it costs to produce the product or service and make sure to earn more than that or it's not a viable business.
- Use free-trial plans for customer to test product or service.

2. Mapping out a business model

Costs

List the most important costs for the offer / service.

Tips for listing costs:

- Financial viability again as with the revenue streams at this stage it is about making sense if a Start-up can make or loose money and the rough assumptions of the costs need to be listed.
- Time frame: Cost can be assumed in different phases of the business, such as how much the research and development of the product / service will cost and how much the running costs of the business will be.
- Check if a profit or loss is being made: When comparing the running costs of the business with how much revenue the business would be making, it should show a positive number meaning a profit.

Key Metrics

To understand if the idea and the business work well, key metrics need to be defined. Metrics can be such as how many potential customers where reached and converted to paying customers? How many recommended the business? How long does the customer remain a client with the business? How much money do they spend with you?

Unfair Advantage

As a last step, define your Unfair Advantage: what makes the business unique that is not easily copied? E.g. reputation, unique brand experience, unique partnerships that lead to an offer that cannot be copied.

3. Prioritize the business model variations

Building a business is about risk mitigation. The Start-up's risk is the highest when starting the business. So how does one identify the riskiest part's of the plan, validate and then mitigate the risks? There are three general groups of risks you should look into on the Lean Canvas (Maurya, 2013):

1. **Product risk:** Getting the right product.
2. **Customer risk:** Getting the right customer.
3. **Market risk:** Building a viable business.

Revisit the canvas that were made and weight them accordingly to their inherent risk - following weighting order can be used (see figure 6):

1. Customer pain level (problem) – Is it a real need? How painful is it?
2. Ease of reach (channel) – How easily can the customer be reached?
3. Price / Gross Margin (revenue streams / cost structure) – Pick customer segment that allows to maximize margins meaning the more money one get's to keep, the fewer customers one needs to reach to break even.
4. Market size (customer segments) – How big is this customer segment relative to the other segments?
5. Technical / Scientific feasibility – Does a minimum solution align and address the customers most pressing needs?

Rank all the business model(s) and prioritize them. It is best, if they are visual on a board or wall so one can work with them. Stick the most favoured one's on top and the other variations under it and put dots into the fields if they are green meaning Hypothesis validated / clear / good to go or red meaning still uncertainty.

Female Founder Tip:

Don't lose too much sleep over getting all filled in, it's about getting business ideas mapped out fast. Don't be afraid to follow several ideas, there are great parallel entrepreneurs to look up to such as Gretta van Riel. Also, how does one fit all this under one hat? Make sure to work with great people. It takes a village to build a business. Also learn to organize and prioritize agendas so that enough time is left for self-reflection and personal time as entrepreneurial health & happiness is key as the entrepreneur is the motor of the business.

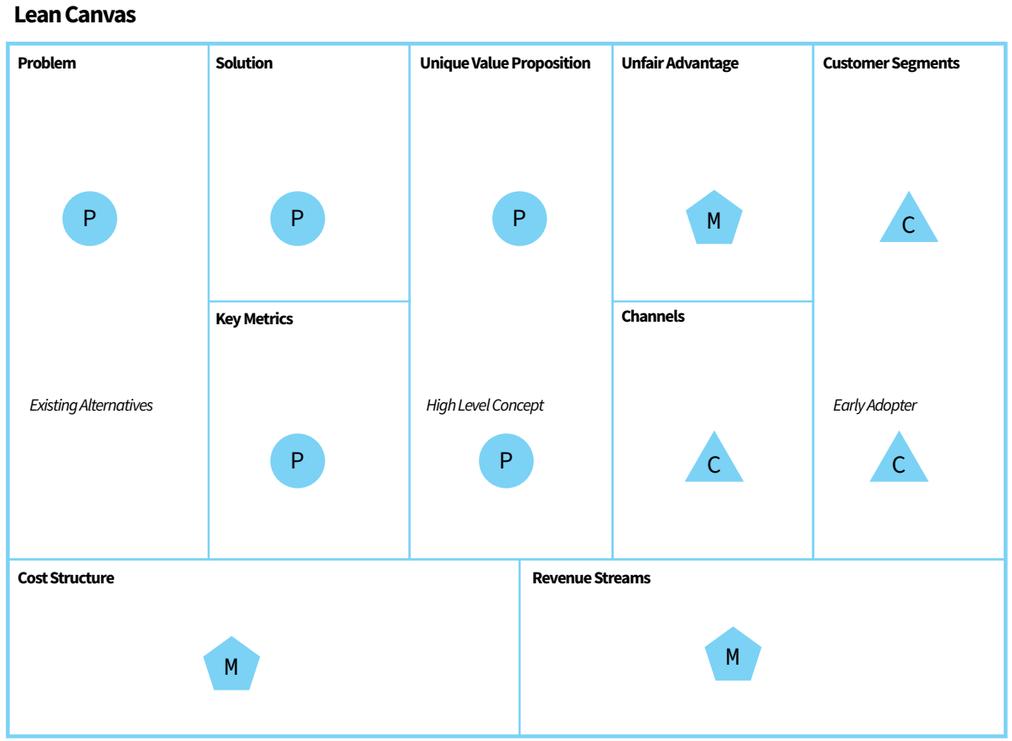

Figure 6: Lean Canvas (Maurya, 2012) including P: Product risk; C: Costumer risk; M: Market risk.

4. Test the business model

Now go out and test the business idea – there are different techniques to do this. In the following there are examples from the "Pretotype It" by Savoia (2011), "The lean Start-up" by Ries (2011) and "Running lean" by Maurya (2012). During building a business, following milestones resp. stages will be crossed (Ries, 2011):

1. Stage Problem / Solution Fit: Identify if one has a problem worth solving?
2. Stage Product (Service) / Market Fit: Did one build something people want?
3. Stage Scale: How does one accelerate growth?

Female Founder Tip:

Why is diminishing risk so important especially for female founders? People will doubt female founders more. Averaging meaning business success and risk diminishment is the best facts for all people not believing in the business. Don't worry if a business idea is dismissed in this stage, it is important to determine this and this does not translate in failure but more good business development to figure this out early on.

What is the difference between pretotype, prototype, MVP and product and when is what used?

In Start-up literature a prototype or minimum viable product [MVP] is used for anything from a paper drawing until an almost ready to sell medical device. When testing your business model, it is important to understand that one moves from a overly simplistic cheap version of the potential service or product to a almost perfect product or service.

- Pretotyping was introduced by Savoia (2011) as a tool box with techniques and tactics to help validate a business idea quickly, objectively, and accurately. The main objective of pretotyping is to answer questions about the product's appeal and usage. Would people be interested in it? Will they use it as expected? Will they continue to use it?

4. Test the business model

- Prototyping answers questions on how to build the product. Can we build it? Will it work as expected? How cheaply can we build it? How fast can we make it?
- An MVP is a very simple version of a product with just enough features to satisfy early customers and provide feedback for future product development (Ries, 2011).

The goal of all of the methods is to move from an unvalidated idea to actually running business.

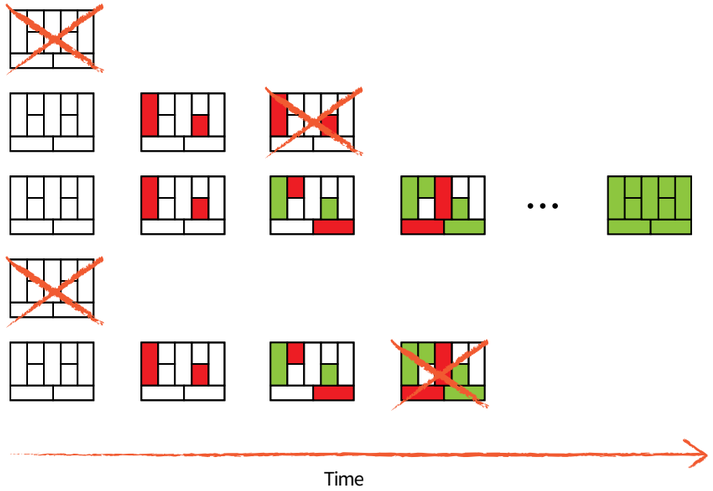

Figure 7: Lean Canvas development over time (Maurya, 2012).

4. Test the business model

How to prepare for the testing of the business model

Preparation recommended by different literature sources always includes building a falsifiable hypothesis on the business model. While Savoia (2011) recommends to isolate a key assumption on the business idea, that if this one is not met, the business model definitely cannot be right. While Maurya (2012) proceeds to recommend to build a falsifiable hypothesis of the riskiest part. Both authors convene a similar important notion: Define what for sure needs to be true or proven wrong so that the business makes sense.

What ways exist to test the business model?

At the beginning of evaluating a business mostly qualitative experiments and interview techniques are used. The further along the growth path of the business, quantitative methods are used.

Methods for problem / solution stage

To make sure the Start-up is addressing the *right it* thus follow Savoia's guide (2011):

1. Isolate the key assumption – What is the one assumption on the business idea that, if false, means it's definitely not the *right it*? Example: People like to eat sushi from the day before if offered at a lower price than today's sushi.
2. Choose a type of pretotype – What type of pretotype will let you isolate and test your key assumption? Example: Put sushi in local restaurant with a sticker on it saying "Yesterday's sushi, 50% off".
3. Make a market engagement hypothesis: How many people will do what with the pretotype? X% of Y will do Z. Example: "At least 20% of sushi eaters will try second-day sushi if it's half the price of regular packaged sushi".
4. Test pretotype – run the real life experiment and track the results. Example: See how many people buy second-days sushi in the restaurant.
5. Learn, refine, hypozoom: Evaluate the results. Refine the pretotype with the new data. If the hypothesis held, decide what other situations should be tested with the pretotype in to get a complete picture (what Savoia (2011) calls "hypozooming").

4. Test the business model

Run interviews with potential customers to understand them and their needs better (Maurya, 2012):

Use the problem interview to verify what drives your potential customers and if they have the assumed problem:

1. Define target customers and approach them: Make personas (actual description of people), approach then and ask if they have time for an interview or observation.

2. Define goal of interview before hand: Try to determine their way of life and verify if they also have the problem one is assuming they have. Then figure out how they are solving the problem today.

3. Here a possible guideline for such an interview of approx. 30 min.
   a. Welcome (set stage and warm up with interviewee).
   b. Collect demographics (ask and asses persons demographics).
   c. Tell a story (set the stage to figure out how person bakes a cake by saying "imagine your in the kitchen and getting ready to bake a cake").
   d. Problem ranking & explore customer's worldview (test if they have problem or not while person is walking you through the "cake making process").
   e. Wrapping up. Ask for permission to follow up and if they can refer you to another interviewee.
   f. Document results.

Tip: Now we are not in academia but in real business life so it is fine after every test to check and adopt the business model and verify the hypothesis. As one is trying to enter a cycle of building a business, measuring the impact and learning and improving the business model again iterating.

4. Test the business model

Develop in a next stage a high-level prototype to test. Maybe the pretotype can be reused and updated. Also a simple landing page provides a good prototype explaining the UVP and the product or service:

1. The prototype of the product or service should include the UVP at a minimum. Website builders such as for example *www.squarespace.com* or *https://wixx.com* can be used or other techniques can be experimented with.

2. Define goal of this interview: Following risks should be checked in this stage of the interview:
   a. Customer risk: Who will the first customers / early adopters be?
   b. Product risk: What is the minimum product / service needed for launch?
   c. Market risk: Will the customers pay for it? What is the max. price that one can aim for?

3. Now schedule again a meeting with the same potential customers and show them the website or value proposition. Here is a possible guideline for an solution interview:
   a. Welcome. Set stage and warm up with the interviewee.
   b. Collect demographics. Ask and asses persons demographics.
   c. Tell a story. Set the stage to figure out how person bakes a cake by saying “imagine don’t have an oven at home and want to bake a cake”.
   d. Demo & test pricing. Let customer go through website and test pricing and see if they will buy, just note down what the person is saying when going through the site.
   e. Wrapping up. Ask for permission to follow up and if they can refer another interviewee.
   f. Document result.

Female Founder Tip:

When testing your business model, make sure the diversity level of the tested group is there so that the data collected is relevant and non-gender-biased.

4. Test the business model

Methods for product / market fitting stage

How can you now test and measure if the customer likes the service / product? Here are a few ways to help you measure this.

Tip: Please bear in mind that focusing on scaling the business before you can demonstrate early traction meaning of customer’s who actually like the product or service is a waste of time.

The Sean Ellis test (Ellis & Brown, 2017) allows to verify their satisfaction level with the product or service. One does this by asking customer how they would feel if they no longer could use the product or service?

1. Very disappointed.
2. Somewhat disappointed.
3. Not disappointed at all.

If approximately 40% or more are very disappointed, then this is good indicator that the business is receiving traction.

In an early stage Start-up growth is derived by factors around customer engagement and retention. The “Pirates Metrix” by Maurya (2012) helps capture and measure these through a model examining five different factors:

- Acquisition: How does one identify the first users?
- Activation: What is the first value experience?
- Retention: What are the drivers to repeat usage?
- Referral: What is the referral engine?
- Revenue: What is the pricing model?

4. Test the business model

In the “Pirates Metrix” one is examining what kind of growth engine makes sense to grow the customer amount:

- Sticky: Is your customer staying with you? → High retention rate thus growth can be driving by keeping customer acquisition and retention rate (churn).
- Viral: Is your customer referring you? → High referral rate thus growth can be driven by keeping the viral coefficient (meaning the number of converted referrals per customer) higher than 1.
- Paid: Is your customer paying you for the service? How much? → High margins, you should at least over time be earning 3 x your cost of getting the customer.

These methods help to validate the business model and monitor growth in the earliest days of a Start-up. The importance of collecting and learning directly with potential customers helps ideate the business in a fast and effective way.

Female Founder Tips:

When selling a business idea it takes courage to approach people. Don’t be too perfectionistic. It has to be good enough for now and safe enough to test the business idea. If one does not feel embarrassed with one’s first version of the business, one has waited too long.

4. Test the business model

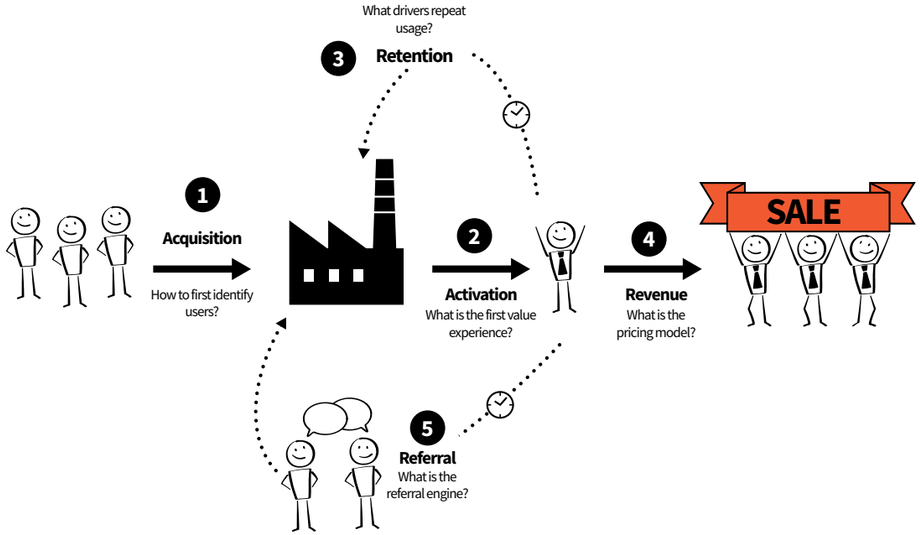

Figure 8: Pirates Metrix (Maurya, 2012).

5. Launching a business

An initial problem / solution phase can be done within several day or a month but should not take too long. However, the product / market phase can take depending on the product / service that is being developed longer until it is ready. After validating the business idea and around the time of the first sale, is the time where one moves from an idea or project to an actual business. See stages in figure 4.

At this stage considering to take steps to professionalize the business such as considering the legal setup of the business, the branding, the marketing strategy and detailed financials. You can find further information on these topics in the Innosuisse trainings.
www.innosuisse.ch

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Where do you get support

How to access innovation support services?

Melanie Paschke & Manuela Dahinden
Zurich-Basel Plant Science Center

The academic institutions in Switzerland have established strong innovation support services including funding opportunities and training courses that not only encourage young academics but also support them in translating science to market. Many of these are mainly technology-oriented.

For example, in 2019, 30 new Spin-offs have been founded at ETH Zurich: thereof 5 in fields such as biotechnology, pharma and medical devices, 10 in information and communications technology, 6 in advanced materials, 1 in micro- and 1 in nanotechnology, etc.

https://ethz.ch/de/news-und-veranstaltungen/eth-news/news/2020/01/mm-Spin-off-bilanz-2020.html

Academic innovation support services encourage scientists to transfer research (especially in biomedicine, biotechnology and deep technologies) into innovation, e.g. develop new applications and products from their research and to found Spin-off or Start-up companies. For female scientists these support structures often have shortcomings: These fields might not be attractive for female entrepreneurs who have gender-specific preferences for different sectors. However, other thematic areas in innovation support that are of high interest for female researchers, are only recently arising in the academic environments, for example support for social innovation and entrepreneurship to targeting the Sustainable Development Goals. At the University of Zurich an innovator camp for social innovators has only recently been implemented. Climate entrepreneurship programs have been implemented by ClimateKic, an European program associated with the ETH Zurich. As a scientist watch out for new opportunities in your academic insititution but also at other places linked to the universities: For example Impact Hub in Switzerland offers an environment for entrepreneurs that want to contribute to the Sustainable Development Goals.

Innovation support of ETH Zurich

Training	· BioEntrepreneurship & Innovation (BEI) Program (together with University of Zurich) · CAS Entrepreneurial Leadership in Technology Ventures (CAS ELTV) carried out by ieLab, ETH Zurich
Funding	· **Pioneer Fellowships** (supports deep science): An expert jury awards 10 to 15 Pioneer Fellowships each year to support future entrepreneurs. The selected projects are supported with CHF 150'000 for 12–18 months and are part of the ieLab community: they have access to the infrastructure at ieLab. · **Wyss Zurich** (supports innovation projects related to regenerative medicine and robotics).
Infra-structure	· **ETH Student Project House:** Open to all ETH students with a desire to experiment within a specific topic or an idea. Bsc, Msc or PhD students can develop creative and critical thinking skills while gaining vital hands-on experience in the maker-space and benefit from infrastructure and mentorship to support project management and product development. The Student Project House gives also students who are no longer assigned to the ETH Zurich the opportunity to engage and mature their projects. · **Innovation & Entrepreneurship Lab:** The ieLab cultivates a culture of innovation, exploration and translation for deep technology. Deep tech, or deep technology Start-up companies are based on substantial scientific advances and high tech engineering innovation. They require lengthy R&D, may take a long time to reach commercial application, and often require large investments to achieve commercial success. Aspiring entrepreneurs are supervised, supported, encouraged and challenged by experienced mentors and coaches on their way to realizing their goals. ieLab gives also access to lab space and infrastructure. · **Technopark Zurich** offers working spaces and research infrastructure.
Legal issues	· **ETH Transfer** supports on commercialisation issues, such as the protection of intellectual property (e.g. patenting, licensing) and the founding of Spin-offs.

Innovation support of University of Zurich

Training	· BioEntrepreneurship & Innovation (BEI) Program · UZH Innovators Camp · Digital Entrepreneurship (e.g. Digital Health) · Business Tools
Funding	· **UZH BioEntrepreneur-Fellowships** provide funding, advice, and support to young researchers in life sciences and related fields who intend to start up a company based on their research in the fields of biotechnology, and medicine-related technologies. UZH Entrepreneur Fellows have the opportunity to develop their technology, product or service and to evaluate the potential for the commercialization prior to founding the company. The support is CHF 150'000 for 18 months for doctoral students taht have completed their PhD or plan to do so within six months after the application deadline are eligible. The program encourages also alumni or applicants from other academic institutions to apply if they will be supported by an UZH professor who will act as a mentor during the fellowship and will provide the necessary lab space and infrastructure to carry out the project. · **Unitectra Proof-of-Concept-Funds** provide initial financial support to technology development projects in order to advance them as near as possible to a potential commercial partner or to develop the necessary foundations for an investment decision (30'000 CHF per project). Such funds can, therefore, help to support the transition of a project into the commercial sector. · **UZH Life Science Funds** provides early financing for UZH Spin-offs in life sciences, biotech and medtech with business ideas based on intellectual property resulting from research done at UZH.
Infra-structure	· **UZH Incubator Lab** with equipped research infrastructure in the Bio-Technopark in Schlieren.
Legal issues	· **Unitectra** supports on commercialisation issues, such as the protection of intellectual property (e.g. patenting, licensing) and the founding of Spin-offs.
Others	· The University of Zurich has provided selected Spin-offs with the UZH Start-up label since 2017.

Innovation support of University of Basel

Training	· Innosuisse Start-up training and coaching (external) · Institute Für Jungunternehmen (external)
Funding	· **The Propelling Grant** is a non-dilutive and highly competitive grant of max. CHF 50'000, aimed at financially supporting high-risk / high-reward scientific discoveries from the University of Basel and validating the discoveries as a "Proof of Concept". The Propelling Grant is an instrument which can support a project in two possible directions, both equally viable. One, as a non-dilutive financial instrument on the path to a future entrepreneurial venture (i.e. startup). Two, as supporting funds to validate a technology which has a strong lead for a commercial / industry partnership, but lacks a validation step (i.e. "too early to collaborate").
Infra-structure	· Innovation Office · Switzerland Innovation Park Basel Area · Baselaunch.ch
Legal issues	· **Unitectra** supports on commercialisation issues, such as the protection of intellectual property (e.g. patenting, licensing) and the founding of Spin-offs.

See also
www.unibas.ch/en/Innovation/Your-Entrepreneurial-Journey/Entrepreneurship-Funding.html

The innovation support in climate entrepreneurship

Training	· **Climate Kic Climathon:** is a global 24-hour climate change hackathon that takes place simultaneously in major cities around the world every year. It attracts innovators, entrepreneurs, students and professionals to come together to create innovative solutions to climate challenges. · **Climate Kic Launchpad:** Is the world's largest green business idea competition. Its mission is to unlock the world's cleantech potential that addresses climate change. · **Climate Kic Greenhouse program:** Offers tailored workshops, a community of climate entrepreneurs, and the support to further develop your idea and create or improve your business plan.
Funding	· **Climate Kic Accelerator program:** Offers coaching, training, technology validation and office space in 21 support locations and 14 EU countries. Selected Start-ups benefit from up to 100'000 CHF seed funding.

Swiss National Funding Programs

BRIDGE is a joint program conducted by the SNSF and Innosuisse – Swiss Innovation Agency. It offers funding opportunities at the intersection of basic research and science-based innovation, thereby supplementing the funding activities of the two organisations. BRIDGE consists of two funding schemes:

- Proof of Concept is aimed at young scientists who wish to develop an application or service based on their research results. These projects may target all kinds of innovations from all research areas.
- Discovery is aimed at experienced scientists who want to explore and implement the innovation potential of research results. Only technological innovations that have a societal and economic impact will be funded.

Swiss Entrepreneurs Foundation (SwissEF) – focuses on improving the framework conditions for entrepreneurship. Swiss EF invests only in Start-ups and SMEs in the growth phase (internationalisation) with a financing requirement of between CHF 5-20 million. No direct investments in early-stage Start-ups with smaller financing requirements.

Innosuisse – Swiss Innovation Agency supports science-based innovation in the interest of the economy and society through: innovation projects, support for Start-ups, internationalisation and networking support. Innosuisse uses the following criteria to assess the quality of the applications submitted:

- Value creation and sustainability in Switzerland: Will implementing the research results on the market have a long-term, positive impact on the company's position in relation to its competitors?
- For social and society-focused innovation projects: If the project is implemented successfully, will it verifiably reduce social costs and add value to the economy?

European Funding Schemes

The **H2020 Fast Track to Innovation (FTI)** provides funding for bottom-up proposals for close-to-market innovation activities in any area of technology or application.

The **Eurostars Programme** is a joint program between EUREKA and the European Commission specifically dedicated to research-performing SMEs.

Foundations

Gebert Rüf Foundation for digital entrepreneurship: The Gebert Rüf Stiftung was founded by entrepreneur Heinrich Gebert as a science and innovation foundation with the aim of "strengthening Switzerland as a top business location and a place to live". The foundation's role is to take risks and provide funding in order to boost its mission statement – 'Making science effective'. It positions itself in the 'valley of death', where for many innovative projects the grant-making chain breaks down, research funds are no longer available and no venture capital is in sight. The funding policy applies in particular to projects of up-and-coming entrepreneurial talents who want to pursue their own paths.

Support in social innovation

Innovator Camp of University of Zurich offers in collaboration with the Zurich University of the Arts (ZHdK) a format for the ideation phase. The UZH Innovators Camp is open to all students and young scientists at the UZH, ZHdK and ETH Zurich. It is an in-class program that promotes entrepreneurial activities.

SEIF Social Impact Academy offers targeted support in crucial areas of the market entry and growth phase of impact driven businesses for Start-ups with a proof of concept. The aim is to make Start-up ready for impact investments through individual coaching and input sessions by experts.

Impact Hubs

The Swiss-wide community consists of entrepreneurs, creatives and techies who can benefit from the services of the Impact Hub network throughout Switzerland. These include co-working places, meeting rooms, events and Start-up support programs. The association's activities focus on entrepreneurship, sustainable development, innovation and new forms of work. Gender topics are high on their agenda!

Programs, initiatives and networks especially for women.

CONNECT – Connecting Women's Careers in Academia and Industry is a program by all institutions of the ETH domain and the University of Zurich in collaboration with the project partners to encourage women from science, technology, engineering and mathematics (STEM) to plan and develop their career according to their own vision.

www.gleichstellung.uzh.ch/de/politik/kooperationsprojekte/connect.html

***fem*inno** – Female innovation and Career Development in Life Sciences. Doctoral students and postdocs from the ETH Zurich, University of Zurich and University of Basel.

www.feminno.ch

Antelope is a competitive, compact and tailor-made career program in which highly qualified female postdoctoral researchers and excellent, advanced doctoral students from all faculties are supported in the systematic planning and development of their academic careers and prepared for future leadership and management assignments.

www.unibas.ch/antelope

FEMtrepreneur is an initiative by the University of Basel, the Impact Hub Basel, HBA (Healthcare Businesswomen Association), WomenMatters and WEHub (India). FEMtrepreneurs brings together an ecosystem of entrepreneurial and innovative minds. They want to create opportunities for female entrepreneurs and leaders.

www.twistbasel.com

Female entrepreneurship communities and associations

- Start-upfrauen.ch
- businessfrau.ch
- wirtschaftsfrauen.ch
- weshapetech
- swonet
- frauenunternehmen.ch
- femmespme.ch
- womenway
- bossladieszurich.ch
- nefu.ch
- bpw.ch
- weadvance.ch
- donnainformatica.ch
- ellepreneur.ch
- unternehmerinnenschweiz.ch
- womenmatters.ch

Awards

- Global Student Entrepreneur Award
- TOP 100 Swiss Start-up Award
- Support prize by the W.A. de Vigier Foundation
- Swiss Economic Forum (SEF) Women Award

Tip: do not forget that in Switzerland you are surrounded by many founders, investors and all those in politics, administration and society who are committed to entrepreneurship and innovation and create an ecosystem facilitating your journey to success. This guideline is not comprehensive.

Insights into *femi*nno

Female innovation and career development in life sciences.

Melanie Paschke & Ute C. Budliger

How can you transform ideas from the bench into innovation after accomplishing your PhD or postdoc? It is well understood that it is time for a more open innovation-friendly culture in our research groups, i.e. an improved research and innovation culture that facilitates the transfer of research and innovation to society. Currently we are not making the best use of the intellectual, emotional and innovative capability that junior scientists represent; and this at a time when the world is confronted with many issues that need urgent attention, issues such as the environment, the climate or the aging population to name just a few.

While we are able to find a high number of articles about how universities can grow a culture of academic innovation, understanding its greatest resource, namely, what its students can do to stimulate an innovation driven culture, remains untouched (Arundel et al. 2016; Olson & Dahlberg, 2013). Innovation cannot be managed top down, instead it must come from people who, themselves, set their own goals and establish the appropriate plans to reach them. A recent publication of the League of European Research Universities (LERU) emphasizes:

Universities should increasingly become the driving force in forming entrepreneurial ecosystems in which students are no longer a human resource that is being deployed, but an entrepreneurial driving force that creates new value in society.

Fyen et al., 2019

We agree based on our study and experiences throughout the *fem*inno program that universities need to reshape their role in the innovation process and increase their direct support of entrepreneurial activities. To which extent this will increase the introduction of new innovations to society remains to be revealed. To get young people thinking about creating value rather than getting the job done, entrepreneurship education is as much needed as entrepreneurship support activities (Hofer et al., 2010).

Entrepreneurs recognize opportunities and create new value or solve problems in society. However, applying knowledge into sustainable and impact-full innovations remains a challenge. We need scientists well equipped with entrepreneurial skills and attitudes. Academic institutions need to be aware of their role in entrepreneurial ecosystems, in order to educate graduates and staff so that a way is made to create value in organizations, in the economy and in society (Fyen et al., 2019).

Centres for Innovation were established at all three participating universities to group together Start-up support activities and to promote entrepreneurship, however, the focus remains on Biotech, ICT, Material Sciences and Engineering. With the increasing importance of entrepreneurship for sustainable development, other areas, such as climate entrepreneurship, sustainable development, social entrepreneurship, become equally important to these traditional fields of academic entrepreneurship. In these new areas of attention women have been involved and active for a long period, however, often they did not become economically visible. This inequality needs to change.

At the same time, it is acknowledged that the situation for female scientists to participate in the innovation process is more difficult than for men. Especially, at the end of the doctoral or the postdoctoral period, many scientists face a time of elevated uncertainty. The following factors may hinder women in progressing their career and may also contribute to the low number of women that found their own company: low confidence in their own efficacy and resilience; lack of role models; need for supportive partners, supervisors and institutions; lack of encouraging and innovation-friendly environments; lack of industry experience and knowledge; and restricted access to supporting and informal networks (Gibson, 2006). Many young couples start to have families. Consequently, there is a high risk that the next career step of the women is delayed due to pregnancy and maternity leave and their innovative ideas do not enter the market. Consequently, those factors addressed in a professional way as during the *fem*inno program, will have high impact on the career development of women. Besides, there is the opportunity that the parenthood experience, combined with proper societal and personal support, can lead to different/innovative ideas that can enter the market.

It should be part of universities' innovation culture to support scientists during transition from academia to a non-academic role or Start-up enterprise and especially if their research results are less advanced or not sufficiently promising in the view of their supervisors. For the most part women in this phase lose their momentum and are released into unemployment or to less fulfilling job-opportunities. It is the time when young women benefit most from a women-only "space" that allows them to reflect on their gender-specific personal values and strengths, to work to resolve their uncertainties and be confident to boldly see the strength and value of making their needs visible.

Men and women learn differently for many reasons, both cultural and historical. Girls and women learn differently in single- sex and mixed-sex classes, and seem to respond positively to "tailored" methods (OECD, 1998): wherever entrepreneurial competence learning is provided, the materials should include women as decision makers and as models for aspiring entrepreneurs. Women generally have different experiences, needs and preferences, have made different choices and pursued different paths (OECD, 1998). They seem often to be more interested than men in management skills and issues, and less interested in finance (Schubert et al, 2019). Thus, women would not feel strange or awkward if they could connect to female groups! Luckily, offers for "women only" are slowly becoming standard and are being readily accepted by women.

There is no implication that such groups are generally more effective than mixed groups but they are certainly different and have the entitlement to co-exist and offer an alternative source of knowledge and support for women in the innovation process. Especially in the beginning of an innovation process when shaping original ideas, women communities are very helpful in creating momentum and encouragement, and possibly providing expertise or even partnerships.

A strong point is about the psychological safety that those kind of groups like feminno provide.

Dr. Arianna Nigro, former feminno participant

More senior women may naturally serve as mentors or support due to their larger networks and experience.

Recent recommendations of ETH Zurich have suggested to include activities that sensitize and prepare female scientists for entrepreneurship when they are still part of the academic environment:

The factors that motivate researchers to start a business appear to be mostly the same for women and men, but their importance varies. The two most important factors for men and women are entrepreneurial personality and entrepreneurial skills, but the order differs! In the case of men, personality is more likely to be the decisive factor in starting a business, whereas, in the case of women, the perception of their entrepreneurial skills plays a major role.

Schubert et al., 2019 – p. 24.

Thus, if entrepreneurship among women is to be promoted, targeted entrepreneurship training for women seems to be essential.

Schubert et al., 2019 – p. 19.

Universities in Switzerland are currently working on solutions to manage this situation and dedicate space and resources for this large number of enthusiastic young female scientists. Examples of women-only mentoring programs dedicated to female scientists are for example the Antelope (University of Basel), CONNECT (Connecting Women's Careers in Academia and Industry) (ETH Zurich & University of Zurich) or smaller initiatives, such as the FEMtrepreneurs (University of Basel).

How could we capitalize on this potential and guide women, especially young women, on alternative career paths alongside that leading to professorship? How can we encourage them to have a look into other options in academia, industry, in a Start-up or as entrepreneurs? Despite the fact that universities are slowly improving their offers to promote the entrepreneurial mindset of their students, they do not see their role in supporting junior scientists who have successfully completed their assignments in academia. Academic institutions will not support young scientists, who are not matriculated or employed at the respective institution, which is a massive obstacle for recently graduated PhDs or postdocs. How can we support a group of women that do not even have a title?

Nobody seems to want to 'eat the cream'. The female scientists at Swiss Universities are just waiting to mature ideas and contribute to a sustainable society. Their academic career, publication record and social engagement are astonishing. We have observed that the tailored support has tremendous impact and is a stepping-stone for the participants bringing it to a new role in private industry, a Start-up, or an increased commitment to pursue a career in academia.

Ute C. Budliger, former program manager of feminno

With this motivation, the Plant Science Center together with representatives of the UZH Career Services, the departments of Diversity (University of Zurich and University of Basel) and Life Science Zurich launched the feminno program to support women in this critical phase of their career. The *fem*inno program for women in Life Sciences (doctoral students and postdocs) from ETH Zurich, University of Zurich and University of Basel is a program developed for 20 participants per cohort and takes about 12 full days spread over 6 months.

*Fem*inno is an acronym and stands for *f*emale and *inno*vation. This program guides and encourages female life scientists to follow-up on initial ideas and to assess if they hold up as an opportunity for an innovation. With this, the program offers also insights into the opportunities for a career outside of the academic environment.

*Fem*inno encourages and guides women to make an educated decision about their individual careers through reflection on their values, resources and competencies. The program was carried out three times between 2018–2019, and it will continue in 2020. For six months international doctoral students and postdocs worked 120 hours (equal to 4 ECTS). A total of 53 women (from ETH Zurich, University of Zurich and University of Basel) took part in diverse workshops, lectures and seminars, and were able to meet numerous role-models and mentors to accompany and support them during a phase of re-orientation and promotion of ideas. In the course of this program, we defined and concentrated on ideation.

Ideation as the creative process of generating, developing, and communicating new ideas, where an idea is understood as a basic element of thought that can be either visual, concrete, or abstract

Johnson, 2005 – p. 613.

It comprises all stages of a thought cycle, from innovation, to development, to actualization (Graham & Bachmann, 2004).

The table below gives an overview of what the courses of the *fem*inno program offered. Naturally, the personal network, especially when it comes to role models and mentors is mostly limited. With more than 50 female speakers and lecturers, who (for the most part) volunteered to support the program, filling this gap is the central objective of the program and highly appreciated by the participants. Identification of competences and values sets the scene and is fundamental for the development of confidence and self-esteem.

Modules of the feminno program

Career Retreat

Network (role models and mentors), confidence about competences and values, knowledge about the Swiss innovation ecosystem. Establish an action plan to be followed through the course of the program.

Negotiation Training

Rhetorical strength and clues, confidence talking to e.g. peers, managers, business partners or investors.

Innovation Seminars and Workshop

Business basics, development and maturing of entrepreneurial mindset. Apply business canvas and other tools for a comprehensive assessment of ideas. Insights, academic and non-academic innovation ecosystems and funding.

Company visits

Practical insights into innovative business environments (R&D), management of relationships (role models and mentors).

The **3-day career retreat** is the kick-off of the *fem*inno program. In workshops, presentations, self-study, and panel discussions, career resources are developed in teams, thus increasing the *fem*inno participants' career readiness.
During the career retreat all participants of the *fem*inno program were asked to identify at least three goals which they would like to achieve during the program. For this, ideas, suggestions and procedures were provided, and collected during the sessions at the beginning of the program. The participants populated an Action Plan (see page 30). Participants were asked to do a progress self- assessment on a scale 1–10 in the action plan (at the beginning, after 3 and after 6 months) indicating the starting, interim and final score. For the most parts at least 6 points of improvement could be seen between the beginning and the final evaluation at the end of the program. It was astonishing to see the impact of the *fem*inno program in achieving or improving personal goals.
Most goals noted in the Action Plans were around soft skills and job finding, e.g. around mentoring, networking, job opportunities, negotiation, building their own projects and managing work-life balance. Besides these, the lack of German skills and with this the difficulty to study German in an English-speaking research environment was frequently mentioned.
It is interesting to note that in the beginning of the program less of the goals were about founding a company or maturing ideas from their own research. This might be due to the nature of the very basic research or to the lack of an entrepreneurial mind-set in the research group in general. However, in the course of the program more than half of the participants developed ideas and were encouraged to look into entrepreneurship as an alternative career path.

The Gender Monitoring Report of the ETH Zurich stated that women often struggle with the idea of promoting a project or entering the Start-up environment because they believe they lack the entrepreneurial skills. Our experiences in *fem*inno confirm this: many participants shy away from the management challenges and consider their competences in business to be insufficient since, as being scientists, they are often unfamiliar with marketing, sales, or attracting investors. Therefore, business basics have been included in the program as follows:

In the **innovation workshop** participants learn how to test their business idea by using the lean Start-up method. Lean Start-up explains how to start a business or launch a product with as few resources as possible. Topics are:

- MINDSET: Why and how focusing on a customer's problem instead of product solution helps you to build your business in a lean way.
- PROCESS KNOW HOW: What process you are embarking on as an entrepreneur so you know where you stand and what to focus on.
- TOOLSET: Learning how to map out your business idea into an actual business on a canvas which you can use as a compass to change direction and measure your progress.
- ENABLING SKILLS: Know how to test your business idea by asking central questions and using a customer centric approach which also can be used in other life and business contexts.

At the end of the workshop participants present their Business Model Canvas that outlines their business case for a new product or service that addresses their selected challenge or opportunity. The work is either done individually or in a group.
There are many tools and much knowledge available around an innovation process, but well-educated academics with a research background were found to intrinsically possess an entrepreneurial mind-set. They are also confident with project management through their experiences from research. And, we observed that creating this awareness makes a true difference in the motivation about entering the innovation process.

Innovation seminars: An often-neglected perspective when assessing a business idea is the gender-based perspectives in the innovation process. For this *fem*inno offers an innovation seminar to discuss whether the respective ideas are gender sensitive and gender innovative (*innovation seminar 1*). During this session, the concepts of sex and gender is introduced. The integration of gender in research can lead to innovation and participants are provided with a rationale and methods for integrating a sex/gender perspective in life science.
In the next session (*innovation seminar 2*), the focus moves to the most common funding sources of research and / or innovation projects. Real life cases of university Spin-offs and group leaders in academic structures are presented and how they financed their research or the development of their first product, process or service is discussed. Participants are motivated to go for their own funding in the near future. Universities offer specific support, which is also introduced (see pages 80–82). In a practical part the young investigators are asked to familiarize themselves with the funding landscape and identify a possible funding source.
Having identified a source of funding, it is often essential to present (pitch) the idea to investors or other sponsors. As part of the *fem*inno program, participants also learn to extract the essence of their idea (core of the innovation) and practice pitching effectively in a very short time and work to improve body language and appearance (*innovation seminar 3*).

Innovation seminar 4 is around patents & licensing of innovation. Participants learn what is patentable and what is the added value of a patent. After the seminar participants are familiar with the patenting process and know who to contact.

Negotiation training: In the process of working towards empowering more women in the innovation process, being able to negotiate with impact is key to success.
Gender disparities are also very pronounced in negotiation and this has serious implications on their individual careers and also for the success inside companies. The reality is that many women report to feel much less confident about negotiating than men do (Babcock, 2003). Women typically do not ask for raises, promotions, or better opportunities. Unlike men, they do not ask for recognition for the work they do. Studies show that women are less likely to negotiate than men, but effective negotiating skills are absolutely essential for both companies and female employees
It is worth noting here that there is a recent update to this research in Australian workers (Uwagba, 2019) in which it was said that women are asking, but not getting. This does not negate the earlier work, but raises interesting questions: why are they not successful? Possible avenues worth exploring could include persistence (societal expectations), confidence, technique, gender specific language as well as the more obvious overt sexism.
Why women are less likely to negotiate than men, the consequences of not negotiating, and how women can be their own worst enemies during a negotiation are important components of the negotiation training. Participants study the differences in language, style and manner between the genders when negotiating. Case studies are used to role play and highlight successful and unsuccessful negotiation scenarios.

Industry visits: Last but not least, *fem*inno's success is also based on collaboration with diverse companies, which invite us to touch base with management and employees. The objective of the industry visits is to enable the participants to increase their understanding about work and career opportunities in different companies outside of academia with the focus on gender specific topics, working models, careers in Research & Development. These visits often inspire *fem*inno participants to refine their career development plans, build on their network, and potentially find partners for future collaboration or meet HR partners for instant recruitment.

A final **closing even**t then gives the participants the opportunity to pitch their projects during the event and to receive feedback. This event is open to the entire *fem*inno network, and the continuously growing community comes together and builds relationships.

Outputs

The tangible output of the *fem*inno program are Action Plans for personal development, Business Canvas of innovation projects, as well as an increased network of women and men outside of academia and valuable contacts within relevant industries.

*Fem*inno strengthens young women at the end of their doctorate and the postdoctoral phase either in transition from academy to private sector, or to pursue a career in academia. Overall, the program has a significant impact on the points below:

- The ability to make educated decisions about their next career step that is satisfactory and appropriate to their skills. They advocate it confidently. They have started to build business networks. They have understood that it is essential to make themselves and their competencies visible. They have learned to reflect on and overcome their own stereotypes and those of their counterparts.
- Based on their research and their expert knowledge, participants are aware about developing ideas that have innovation potential. They understand how innovation can arise from specialist knowledge, training and ideas and have the necessary entrepreneurial skills and attitudes to implement them. Some of the women are now in the process of bringing innovation to the market.
- They know relevant innovation ecosystems and can participate in them.

We would like to conclude this chapter with some feedback from *fem*inno participants:

The feminno program is the wake-up call for female scientists in the swiss academia ecosystem.

It makes time to reflect (aims, values), grow and have a look over the rim, become more pro-active, own your career and life.

It is a stepping stone. It allows to make educated decision on where to pursue academia or industry or to understand what it takes to move into industry or Start-up.

A participant who joined a Start-up right after the program, explains:

feminno played a role in that it encouraged me to work for Ava and motivated me to stay with it. So it strengthened me to the extent that it brought me a little closer to the Start-up world and made it tastier. I already had the inspiration / idea for it and a first acquaintance before feminno.

Another participant:

Become an entrepreneur not a manager! Managing is out! Start as an entrepreneur!

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Towards an innovation-friendly culture for female scientists in the Life Sciences:

Results from a Delphi study.

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Introduction

Universities could promote entrepreneurship as a career option and provide entrepreneurship experiences even to undergraduate and Master's degree students. Swiss universities should support transition phases at the end of the Master's and doctoral studies. Especially for their alumni with an international background to allow them to contribute with their valuable knowledge to the Swiss labor market. In accordance with an historically evolved division of tasks between the private and public sectors, basic research is mainly carried out at the ETH and the universities. In return, applied research and development and the translation of knowledge into marketable innovations is primarily the domain of the private sector and the universities of applied sciences. This distinction seems to be outdated and it should be the culture of all universities to support all aspects of innovation (National Academy of Science, 2013). Therefore, we recommend that also universities increase their efforts to accelerate innovation.

Design of the Delphi survey

A three-round Delphi survey explored the views of program participants, as well as experts in the fields of innovation management, gender equality, entrepreneurship, research or from other areas about the facilitators, barriers, requirements, resources and incentives that influence the access of female scientists to innovation transfer. Questionnaires in Round 1, Round 2 and Round 3 were implemented using the interactive survey-platform Google Forms. In Round 1 statements were gathered from open-ended questions (16 respondents, from whom 7 were PhD students, 4 postdocs, 1 Alumni postdoc, 3 non-academic positions and 1 CEO). Round 1 responses to questions were sorted and grouped by common answers. These answers were written as statements for Round 2. In round 2, 86 respondents completed the survey questionnaire (from whom 53 were PhD students, 15 postdocs, 2 group leaders, 4 professors and 12 non-academic positions) indicated their level of agreement (scale anchors were 1: strongly disagree, 5: strongly agree) with 74 statements from round 1. For round 3, statements from round 2 with average agreement above 3.0 as well as additional statements formulated in free text fields were grouped into six topics: facilitators, barriers, requirements, resources and competencies, incentives to enter the innovation process and factors for family-friendly innovation process. 65 respondents completed the survey questionnaire of the Round 3 with 59 statements (34 respondents were scientists in an academic institution, 21 – participants in the *fem*inno program, 5 – experts in the *fem*inno program, 3 – interested in the *fem*inno program, 1 – project manager, 1 – board member). 91% of respondents were women and 9% were men.

Results

The limited results of the Delphi survey indicate that we have not yet created a suitable culture to support female scientists in building self-esteem and see innovation as a realistic alternative or supplement to their research.

- A network of women (Mean=7.27) was ranked as the **most important facilitator** for launching a business or starting a collaboration between university and the private sector. Further respondents mentioned the financial support (5.78), self-confidence (5.65) and good negotiation skills (5.39). *Facilitators were ranked on 1–10 scale, where 1 – the least important, 10 – the most important.*
- Lack of a network in industry (7.44), lack of financial support (7.08) and conflict of interest between academic supervisor and researcher on the ownership of research project (6.95) were lined as the **most important barriers**. Further, respondents highlighted lack of support in academic culture (6.54) and low self-confidence (6.41) as important barriers. *Barriers were ranked on 1–11 scale, where 1 – the least important, 11 – the most important.*
- Innovation-friendly academic environment (7.95) and structured support of exchange between academia and private sector (7.78) were named as the **most important requirements**. Decentralization of professor`s power (7.32), more funding for applied research (7.19), stronger visibility of available support (e.g. mentors, coaches, role models) and encouragement from peers and supervisors (7.05) were also named as

important requirements. *Requirements were ranked on 1–12 scale, where 1 – the least important, 12 – the most important.*

- Financial support (6.86), a network of experts (6.81), self-confidence (6.78) and resilience (6.69) were named as the **most important resources**. Motivation to explore (6.17) and negotiation skills (5.92) were also named as important competencies. *Resources and competencies were ranked on 1–11 scale, where 1 – the least important, 11 – the most important*.
- Flexible and self-organized working time (5.83) was ranked as the **most important incentive** for starting a business. Realizing own ideas (5.42), self-fulfillment (5.36), working in creative and stimulating environment (5.22) and living passion for innovative topic (5.17) were highlighted as important incentives. *Incentives were ranked on 1–9 scale, where 1 – the least important, 9 – the most important.*

Recommendations

The STEM fields and those who work in them are critical engines of innovation and growth. However, having the knowledge alone is not enough. The most probable innovators are those with the knowledge, access and resources, as well as the motivation coupled with inspiration to embark upon the path to discovery.

McCauley Bush, 2013 - p.20.

Respondents confirmed in their statements many factors that are also prevalent in literature as facilitating or hindering women in progressing with their innovation: confidence in own efficacy and resilience, role models, support of partners, supervisors and institutions, encouraging and innovation-friendly environments, industry experience and knowledge, and access to supporting and informal networks (Gibson, 2006; Mc Cauley Bush, 2013; OECD, 1998).

Some of these factors are more important for respondents than others and we concentrate in the following on what institutionalized innovation and mentoring programs should do to support female scientists in establishing a network and elevate confidence. Additionally, we propose an understanding of an innovation-friendly entrepreneurial academic culture and how this culture could be supported by institutionalized programs. Support to develop a strong personality is the basis towards successful entrepreneurship and a must for most female life scientists.

What can mentoring do for female life scientists?

In general mentoring can serve three functions. It can give access to informal networks and resources, can offer emotional support as well as increase of self-confidence and provide training and information also about the political and organizational frameworks of a system (Ragins, 1989).

Support female life scientists to build networks. Networks including industry representatives, contact to successful innovative women and to professionals of diverse background are important facilitators when proceeding with innovation. Consequently, a lack of a network in industry was named as the most important barrier for female scientists. Recruitment to higher positions, establishing industry-academia collaborations or investors' decisions for innovation funding are driven by belonging to an informal network that women are less likely to participate in (Van den Brink, 2011). Their own growing networks will link the women to current and future gatekeepers and mentors that can give tacit and necessary knowledge and the political background on how a certain system or organization works. Especially important for female scientists is the contact to experienced and successful women in innovation and business. These gatekeepers can, in their role, open the doors and actively support the female scientists.
Institutionalized innovation programs as *fem*inno can strongly encourage participants to build their networks through enabling the easy access to experts, experienced women but also through structured formats, for example company visits, ideation exchanges with industry and future collaborators from outside academia and invitation of role models during training events.

For female scientists the channels and ways how to reach the private sector are normally not visible and we are in poor interaction with the world outside academia.

Respondent of the Delphi survey

Strongly support female life scientists to build self-confidence, self-efficacy and resilience. These were mentioned as the most important competencies that female scientists should have to progress with their ideas. Indeed, self-efficacy is very important for entrepreneurship (Schubert et al., 2019).
In practice, especially mentoring to build self-confidence, self-efficacy and resilience is perceived by female participants as essential in institutionalized programs: having someone who truly cares and acts in their interests, a feeling of connection and being confirmed about being worth (Gibson, 2006) in a situation of high insecurities as transition phases are. As transition to next phases in the career are designed as an individually-driven project today, women need self-management and the confidence to shape their own career environment for success but also need a feeling of belonging. Programs including mentoring can offer career environments that reverse the feeling of being isolated.
Institutional supported programs as *fem*inno can have a strong role to increase both self-confidence of the female scientists and their resilience.

Offer training in entrepreneurship, that especially includes training also in economics, negotiation and leadership and **make easy-to-access support available**, e.g. mentors, coaches and role models.

Ask role models from industry and Start-ups back to universities to teach innovation.

Respondent of the Delphi survey

Recognize innovation and entrepreneurial activities as an opportunity.

Publish or perish culture does not allow out of the box thinking." Another one: "There are incentives missing for innovation in the academic culture. This limits the mind-set and students are not encouraged to follow up on own ideas." Another respondent highlighted: "We should also remember that in many research groups the culture of building a company or following a research plan to industry doesn't exist! We need to accept that many research investigators are not willing to take such a risk or they are fully focused on research!

Respondents of the Delphi survey

A conflict of interests is generated by the traditional academic reward system, which is focused on peer reviewed publication of (generally) primary research, and the technology transfer reward system, which is focused on revenue generation from (generally) applied research. This dilemma can only be solved at the highest level of university governance. Thus, incentives should be created for faculty within the university to expand their research domains to include questions related to innovation and entrepreneurship from technical and managerial perspectives (Hofer et al., 2010).

Based on my experience and stories collected, many supervisors would not even understand what this sentence means and not be able to use incentives. An organizational structure with shared values is for me the major issue.

Respondent of the Delphi survey

Comprehensive studies and reviews suggesting action plans and models for the future on how universities may implement a more innovation-friendly culture and improve the academic-industry partnerships exist to date (Hofer et al., 2010, Belfield, 2012).

Offer institutional frameworks to resolve possible conflicts of interest between academic supervisor and scientists.

Faculty members and students can have conflicts of interest and conflicts of commitment that need to be understood and properly managed.

National Academy of Sciences, 2013 - p.17.

Will the principal investigator enable the doctoral student or postdoctoral fellow to concentrate on building innovation during the research? Are lab space and resources available for development of innovation products? Who owns the innovation? In general, these questions are important for innovators in the academic context of both genders, however, female academic innovators might be especially vulnerable because implicit stereotypes make it less likely that they will engage in negotiations about these matters. Studies have shown that women tend to get penalized if they negotiate hard about for example salary, work load, resources or incentives (Sandberg, 2013).

Good negotiation skills are an important factor, as female scientists, we would tend to be grateful if someone is willing to collaborate without maybe realizing that the other party is also gaining something. Understanding this and knowing how to build a fair collaboration with clever negotiations is important.

Participant of Delphi study

Especially recognizing that for some female scientists the transition and Start-up phase begins in the highly sensitive phases when the career insecurity might collide with family planning. Career plans of partners add to the complexity. Institutional access to innovation support and infrastructure in this early alumna phase might be especially valuable for these women. Only, women who have access to the necessary resources and also receive the necessary support for family work will be able to implement career paths and bring their ideas forward. To a certain extent this was also prevalent during the *fem*inno program. Absences of women with children had been significantly higher than their peers, or women who have the support of their husband, parents or in-laws.

Easily-available, in-house and affordable childcare was confirmed as the most important resource that higher institutions can offer to their female scientists and innovators. **Flexible and self-organized working time** was ranked as the most important incentive for women to enter an innovation process. Academic environments can have an important key role in enabling innovation as they allow self-organization and home offices and flexible working times as part of their culture.

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Beyond

Organisations and people

The *fem*inno program brought together competences from the Zurich-Basel Plant Science Center, the Career Services at University of Zurich, the Office for Gender Equality and Diversity at University of Zurich, the Office for Diversity at University of Basel and Life Sciences Zurich. The steering group is: Melanie Paschke, Manuela Dahinden, Roger Gfroerer, Christiane Löwe, Nicole Kälin, Silvie Cuperus.

www.feminno.ch

The Zurich-Basel Plant Science Center (PSC) is a competence center linking and supporting the plant science research community of the ETH Zurich, University of Zurich and the University of Basel. The center promotes research, education and outreach and provides platforms for interactions with peers, policymakers, industry, stakeholders and the public.

www.plantsciences.ch

The UZH Career Services aim to increase the career preparedness of UZH students and graduates. Students are prepared for the transition to working life with counseling, events and workshops, career programs and online guides. The UZH Career Services publishes job advertisements, employer events and company profiles on its own career platform https://uzhcareer.ch. Students are given the opportunity to get in touch with employers at the Long Night of Careers, at the UZH JobHub and at other events on campus. More information can be found on www.careerservices.uzh.ch. For regular updates and news follow-us on our social media channels.

www.careerservices.uzh.ch

The Office for Gender Equality and Diversity at University of Zurich is the main contact point for issues and questions about gender equality at the University of Zurich.

www.gleichstellung.uzh.ch

The Diversity Office supports the university management in its goal to noticeably increase the percentage of women at higher qualification levels, and to create a university that is equality-oriented, family-friendly and entirely free of discrimination.

www.unibas.ch/diversity

Life Science Zurich is a joint platform of the University of Zurich and the ETH Zurich. LSZ promotes cooperation between the Life Science stakeholders (universities – industry – authorities) in the Greater Zurich area as well as with other life science centers in Switzerland and across the world. The Life Science Graduate School aims to offer one of the best doctoral schools worldwide in life sciences and prepares young researchers to develop into tomorrow's leaders in research, industry and society. Our Young Scientist Network strives to reduce the gap between academic research and the life science industry. It hosts events for young academics and stimulates interactions between people from various life science sectors.

www.lifescience-zurich.uzh.ch

www.feminno.ch