

Transfer activities at Swiss universities of applied sciences: achievements and challenges

Prof. Dr. Franz Barjak, University of Applied Sciences and Arts Northwestern Switzerland

franz.barjak@fhnw.ch (+41 62 957 26 84)



Knowledge and technology transfer of universities of applied sciences: new directions based on proven concepts Olten, University of Applied Sciences and Arts Northwestern Switzerland, 03.11.2021



Three claims:

- 1. Knowledge and technology transfer is not the third but the second mission of universities of applied sciences (UAS), but this is at least in part not sufficiently recognized and acknowledged.
- 2. The research resources existing at the UAS are underfinanced and therefore underutilized.
- 3. Teaching-based transfers are currently the channel with the broadest impact we should address these strategically and consider them more in our transfer strategies.



Transfer is part of the mission of Swiss HEI (including UAS)

Art. 27 Exploitation of research findings

1 The Federal Council may make federal funding for higher education research centres contingent on higher education research centres developing a strategy for their research and innovation activities on the exploitation of knowledge and the knowledge and technology transfer between higher education institutions and the private sector.

2 It may additionally make the **granting of federal funding** contingent on one or more of the following requirements:

- a. the intellectual property rights or the rights of use to the results of federally funded research are transferred to the employer higher education research centre;
- b. the employer higher education research centre concerned takes measures to promote the exploitation of research results, in particular their commercial use, and to share the revenues appropriately with the creators of the intellectual property;
- c. the research and implementing partners propose regulations for intellectual property and rights of use.

(Federal Act on the Promotion of Research and Innovation (RIPA))

Knowledge transfer: from research to impact



Campbell, C., Cavalade, C., Haunold, C., Karanikic, P., Karlsson Dinnetz, M., & Piccaluga. A. (2020). *Knowledge Transfer Metrics - Towards a European-Wide Set of Harmonised Indicators*. https://ec.europa.eu/jrc/en/publication/knowledge-transfer-metrics-towards-european-wide-set-harmonised-indicators.



Measuring university knowledge and tech transfer

| | | | % of 0 v | alues ^a |
|-----------|----|--|----------|-------------------------|
| | 1. | Invention disclosures | 24 | |
| ed | 2. | (Priority) patent applications | 20 | |
| bas | 3. | Patents granted | 21 | |
| ₫ | 4. | License agreements (patents, software, material, other) | 35.5 (pa | tents) |
| | 5. | Revenues from IP | 31 | _ |
| > 0 | 6. | Spin-off companies (use university IP) | 58.5 | ASTP A World of |
| Nev | 7. | Start-ups ^b (do not use university IP, but are started by | 43 | Knowledge Transfer |
| | | students or staff) | | ASTP 2020 Survey Report |
| v v NG | 8. | Contract research agreements | 13.5 | on Knowledge Transfer |
| archulti | 9. | Collaborative research agreements | 14 | |
| ese | 10 | . Consultancy agreements | 16 | Activities in Europe |
| ů v Ř | | | | |

a In the ASTP 2020 survey

Source: ASTP 2020 Survey Report on Knowledge Transfer Activities in Europe. Financial Year 2018 data.



Number of start-up companies^a founded by Swiss HEI/PRO 2010-19



swiTTreport2020

SWISS TECHNOLOGY TRANSFER REPORT



a Switt 2020: "As "Start-up company" all enterprises should be considered, that had their first entry in the trade registry in the previous year and that have a business case dominantly based on research of your organization and that have at least one (co-)founder with affiliation to your organisation (employee, graduate, alumnus)." Source: SwiTT report 2020



Importance of knowledge exchange mechanisms for higher education/public research institutes by type of mechanism and type of organization 2018





Knowledge and technology transfer via research and development projects





Importance of research-based mechanisms by type of organization

(share of institutes rating a mechanism as very important or important out of 717 inst.)





Innosuisse funding for innovation projects in 2020



What is our share at FHNW? - a back-of-the-envelope calculation



Most of the main implementing partners come from the **cantons of** Zurich and Vaud.



1. Cantons of BS, BL, AG, SO fund FHNW

- 2. 52 implementation partners from BS, BL, AG, SO have started Innosuísse projects in 2020
- 3. 26 (estimated) implementation partners have started projects with a UAS, maybe FHNW (6.4% of all 404 funded applications with imp. partners)
- 4. Is this enough? Most likely not. Taking into account that our UAS FHNW had in 2020
 <u>1261 full-time equivalents of academic</u> personnel?*

* FOS higher education statistics

Source: Innosuisse, 2021, p. 31

© Prof. Dr. Franz Barjak, 2021

 $\mathbf{n}|\mathcal{U}$



SNSF: Approved funding for researchers





Corporate funding of R&D at Swiss universities



Extramuros R+D expenses

Extramuros R+D expenses are amounts paid by companies to other companies or organisations for all R+D work carried out outside their own walls. These expenses include the purchase of R+D services provided by third parties (R+D contracts) and grants (R+D contributions) awarded to other actors for R+D activities. In the latter case, funding is provided without specific consideration.

Source: FOS, F+E-Aufwendungen der Privatwirtschaft

https://www.bfs.admin.ch/bfs/de/home/statisti ken/bildung-wissenschaft/technologie/indika torsystem/zugang-indikatoren/w-t-input/f-eaufwendungen-privatwirtschaft.html

[©] Prof. Dr. Franz Barjak, 2021



Important obstacles to KTT

(share of institutes rating an obstacle as very important or important in %)



Source: Barjak, Heimsch, & Maidl, 2020, p. 132



Who are the partners of UAS?



Source: Beck, Hulfeld, Spescha, & Wörter, 2020, p. 145.



Knowledge and technology transfer via teaching





Importance of teaching-based mechanisms by type of organization (share of institutes rating a mechanism as very important or important out of 717 inst.)





Theses as an important tool for knowledge transfer and low-level cooperation



Source: Barjak, Heimsch, & Maidl, 2020, p. 101



How do these numbers scale?

| | ETH domain | Univ. institutes | UAS institutes | Other non- univ. institutes | All institutes |
|---|---------------|---------------------|-------------------|--------------------------------|-------------------|
| Bachelor's and Master's theses p.a. per 10 researchers | 5.08 | 6.59 | 14.26 | 2.99 | 6.92 |
| Bachelor's and Master's theses with companies p.a. per 10 res. | 1.56 | 0.90 | 6.72 | 0.22 | 1.90 |
| in % of all BSc/MSc theses | 30.6% | 13.6% | 47.1% | 7.3% | 27.5% |

2020: <u>12'654</u> BSc/MSc theses at UAS (in the fields covered in the survey* → approx. <u>6'000</u> theses written with/for companies

* Architecture, Construction and Planning, Engineering and IT, Chemistry and Life Sciences, Agriculture and Forestry, Business and Services, Applied Psychology, Health according to FOS, Abschlüsse der Fachhochschulen (ohne PH) nach Jahr, Examensstufe und Fachbereich (https://www.bfs.admin.ch/bfs/en/home/statistics/education-science/diploma/tertiary-higher-institutions/universities-applied.assetdetail.17504256.html) Source: Barjak, Heimsch, & Maidl, 2020, p. 101



Three claims:

- 1. Knowledge and technology transfer is not the third but the second mission of universities of applied sciences (UAS), but this is at least in part not sufficiently recognized and acknowledged.
- 2. The research resources existing at the UAS are underfinanced and therefore underutilized.
- 3. Teaching-based transfers are currently the channel with the broadest impact we should address these strategically and consider them more in our transfer strategies.



Neue Bürcher Beitung

17.3234 POSTULAT

Die Fachhochschulen sind Elfenbeintürme geworden

Verlieren die Fachhochschulen den Kontakt zur Praxis? Glaubt man den Hochschulen, trifft dies nicht zu. Die Kritiker indes sind sich einig: Zunehmend würden Dozierende beschäftigt, denen jegliche Praxiserfahrung fehle.

Jörg Krummenacher 13.02.2018, 05.30 Uhr

□ Merken 🗇 Drucken 🛱 Teilen



Die Fachhochschule Nordwestschweiz in Windisch. (Bild: Karin Hofer / NZZ)

Stärkung des dualen Bildungssystems durch die Wiederherstellung der klaren Rollenabgrenzung zwischen universitären Hochschulen und Fachhochschulen gemäss HFKG

| Eingereicht von: | GMÜR-SCHÖNENBERGER ANDREA Die Mitte-Fraktion. Die Mitte. EVP. Christlichdemokratische Volkspartei der Schweiz |
|-----------------------|---|
| Einreichungsdatum: | 17.03.2017 |
| Eingereicht im: | Nationalrat |
| Stand der Beratungen: | Erledigt |
| | |



ALLES ZUKLAPPEN

- EINGEREICHTER TEXT

Der Bundesrat wird beauftragt, zusammen mit den gemäss Hochschulförderungs- und -koordinationsgesetz (HFKG) zuständigen Organen in einem Bericht die Profile, Titelbezeichnungen und Zugangskriterien von universitären und Fachhochschulen zu klären und zu schärfen. Der Trend zur Angleichung der Hochschultypen und Akademisierung ist zu stoppen. Die Durchlässigkeit soll erhalten bleiben.

lvory tower, academisation?

- \rightarrow Strengthening KTT is the best response to such accusations.
- \rightarrow We must make sure, that the available resources at UAS are used effectively and efficiently for addressing the multiple challenges that we are confronted with.



References

- ASTP (2020). ASTP 2020 Survey Report on Knowledge Transfer Activities in Europe. Financial Year 2018 data. Leiden, the Netherlands. https://www.astp4kt.eu/assets/resources/impact/ASTP%202020%20Survey%20Report%20on%20KT%20Activities%20in%20Europe.pdf.
- Barjak, F., Heimsch, F., & Maidl, E. (2020). Wissens- und Technologietransfer der Wissenschaftsorganisationen in der Schweiz. Langfassung. Bern. https://www.sbfi.admin.ch/dam/sbfi/de/dokumente/webshop/2020/f-i-studie-5.pdf.download.pdf/studie 5 langversion.pdf.
- Beck, M., Hulfeld, F., Spescha, A. & Wörter, M. (2020). Analysis of knowledge and technology transfer in Switzerland the perspective of the enterprises. State Secretariat for Education, Research and Innovation. https://www.sbfi.admin.ch/dam/sbfi/de/dokumente/webshop/2020/f-i-stuie-4.pdf.download.pdf/studie_4_langversion.pdf.
- Campbell, C., Cavalade, C., Haunold, C., Karanikic, P., Karlsson Dinnetz, M., & Piccaluga. A. (2020). *Knowledge Transfer Metrics Towards a European-Wide Set of Harmonised Indicators*. https://ec.europa.eu/jrc/en/publication/knowledge-transfer-metrics-towards-european-wide-set-harmonised-indicators.
- Gmür-Schönenberger, A. (17.03.2017). Stärkung des dualen Bildungssystems durch die Wiederherstellung der klaren Rollenabgrenzung zwischen universitären Hochschulen und Fachhochschulen gemäss HFKG. POSTULAT17.3234. <u>https://www.parlament.ch/de/ratsbetrieb/suche-curia-vista/geschaeft?Affairld=20173234</u>.
- Innosuisse (2021). Jahresmagazin Discover 2020. https://discover-innosuisse.ch/media/Discover-Innosuisse 2020.pdf.
- Krummenacher, J. (13.02.2018). *Die Fachhochschulen sind Elfenbeintürme geworden*. NZZ Online, <u>https://www.nzz.ch/schweiz/die-fachhochschulen-sind-zu-</u>elfenbeintuermen-geworden-ld.1356101.
- Schweizerische Eidgenossenschaft (2021). Federal Act on the Promotion of Research and Innovation (RIPA) of 14 December 2012 (Status as of 15 April 2021). https://www.fedlex.admin.ch/eli/cc/2013/786/en
- swiTT (2021). swiTT Report 2020. Swiss Technology Transfer Report. https://switt.ch/swittreport

Institut



Thank you for your attention!