PROFESSIONALLY ALIGNED HIGHER EDUCATION

OPINIONS AND REFLECTIONS ON STATUS QUO

Executive Summary

Selected results from primary and secondary data research

THIS REPORT INCLUDES

1. Key findings from all conducted research
2. Results from interviews with university officers
3. Findings from workshop with employers' representatives
4. Selected results from student survey on relevant topics
5. Feed-back on implemented pilot
6. Impact analysis

1. KEY FINDINGS

KEY FINDINGS

- **Employers** expect HE institutions to reform teaching, include more practical skills training (including transferable skills), provide newly designed profesionally oriented bachelor‘s degree study programs.
- They perceive a number of quite strong barriers in the emergence of these programs, but are ready to cooperate with HE institutions and provide positions/jobs for graduates.

- Officers representing **universities** with STEM programs are in majority quite intensively cooperating with employers to adjust content of education to employers‘ needs. Most are open to the implemention of profesionally oriented bachelor‘s degree study programs, but there is a minority perceiving these as a threat to universities (downgrading their status/education level).
- University respondents agree on necessary changes in conditions, under which these programs should emerge (e.g. no financial pressure from Ministry of Education, predictability of financial resources for longer future, clear messages from labour market that graduates of these programs are well employable, flexibility in length of the programs, capacity of employers to provide long term practical training in companies and adjustment of legal framework concerning stipends and taxes...)

KEY FINDINGS

- **Students** expect more practical training, applied knowledge and transferable skills, including capacity to act in cross-cultural settings.
- They are interested in apprenticeships relevant to their education, but are not always able to cope with the administrative burden put on them.

- **Government representatives,** have implemented legislative changes defining conditions for professionally oriented bachelor‘s degree study programs.
- These are followed by requirements to change the structure of graduates (proportion of bachelors to proportion of second (masters) level graduates – using financial pressure on HE institutions (which may now be changed after several discussion rounds with universities).
- EU structural funds are offered to start implementation of professionally oriented bachelor‘s degree study programs and to support practical training of students.

- **In general the research documented, that o**pinions are communicated, mutually perceived and we are in a phase of implementation set up and tuning. Obstacles emerge on all sides but the process of aligning HE to the labour market needs is in progress.

KEY FINDINGS

- It appears that the **most impacting driver for change is the pilot** implementation of the first study program in the form of a professionally oriented bachelor‘s degree study program and its continuation with new set of partners in year/volume 2.

- Perceived as a **key burden** at present stage of implementation is the unsolved legal framework in the tax area, which should bring relief to employer as well as student related to the income of students – stipend.

- Under the present set up it is obvious, that **only bigger size employers** will have the capacity (HR, time, financial) to get involved in this kind of programs. Another important element is the **regional proximity** of partners (school and employers).

- Several **myths** in the perception of this kind of programs among public and university representatives have to be tackled.

KEY FINDINGS

- The implemented program proves to be **highly demanding on students** – even more demanding than other bachelor's level programs at the same school.

- The **student feed-back is very positive** on the applied/practical part of study (even demanding a stronger emphasis/time volume in preparation on this part).

- Especially the **mentoring element** (each student has an individual mentor among company managers) proves to be of high success (not only valued by students but by involved managers as well).

- **Competencies, which are the most challenging to master** (at high quality level) are mathematics (physics) and transferable soft skills (including foreign language, project management, presentation skills).

2. INTERVIEWS CONDUCTED WITH UNIVERSITY OFFICERS

SUMMARY FROM INTERVIEWS CONDUCTED WITH UNIVERSITY OFFICERS

Target group:

- Rector, Vice-rector (in one case also Dean level)

Data collection form:

- Structured interview

No. of respondents:

- 6 schools (where STEM faculties exist – STU, TUKE, ŽU, TNUAD, TUZVO, SPU)
- 12 respondents

THE STATUS QUO OF UNIVERSITY COOPERATION WITH EMPLOYERS IN GENERAL

- All interviewed officers from Universities described cooperation with employers (mainly with specific relevant sectors and regional players) as well developed, including adjusting education contents to industry needs
- Companies provide possibilities for practical training and take part in bodies established at the universities who develop proposals for curricula adjustments
- Though capacity for students practical training in companies is limited (far not all students can participate), there is lack of funds which would cover the costs of the company or of the company tutor for the student

- Some companies provide “academia” or “summer school” like programs for selected students – where senior practicioners, including international experts lecture and students become acquainted with the company procedures

- Some schools (but not many) use alumni groups for feed back on education results and for proposals for adjustments in curricula
- Systematic tracking of alumni careers is rather a less developed area at most schools

THE STATUS QUO OF UNIVERSITY COOPERATION WITH EMPLOYERS

In most universities as a standard are included:

- Consulting of thesis by experts from businesses
- Guest lectures from business experts
- Most successful alumni presentations
- Excursions to companies
- Short term practical training in companies (up to 2 weeks)
- Representation of employers on the University (Faculty) Science Board
- Adjustments to curriculum result often as partial inputs to content from employers, without changing titles of subjects as such

EXAMPLES OF BEST PRACTICE

Combined Study Program:

- Specific curriculum developed together with employer
- Students get 70% e-learning and 30% at premises of an employer

Memorandum of cooperation University-Employers:

- Leads to common design of new study programs and cooperation in education

Company academy:

- Special curriculum provided as additional training for students beyond study program – with final certificate
- Education provided by practicioners and foreign experts

Paid apprenticeships:

- Employer provides along with excursions, which are part of the curriculum, also offers for paid apprenticeships – selects most talented students for job offers

EXAMPLES OF BEST PRACTICE

Start up incubator:

- University and companies provide working space for student start up teams at university premises, provide skill development through workshops, direct access to professional tools and machines of different affiliation (electrotechnics, IT, machinery…)

Center with high tech tools:

- Well equipped university center acquires real world scientific/research/construction contracts (students participate)

Head of final exam comity is an external practicioner

APPRENTICESHIPS, PRACTICAL TRAINING, EXCURSIONS

- Universities agree that practical training and apprenticeship are highly important for their education
- Students mostly show interest in practical training
- Most forms are rather short (up to 3 weeks), often rather in form of excursions, not in form of on-the job training
- There is agreement on describing this area still as not sufficiently solved, with low time dotation, not systematically included in the education process
- In some cases part time jobs conducted along with study represent the practical training (most relevant for IT, electrotechnics sectors…)
- A substantial advantage can be drown from own practical centres belonging to the university (like university farms, technology centres with machines and tools)

APPRENTICESHIPS, PRACTICAL TRAINING, EXCURSIONS

Obstacles:

- Apprenticeships and practical training in companies still represent an unrewarded service (no resources for covering costs of company/tutors)
- The capacity of companies is very limited and can not cover the extent necessary for all (most) students
- Another burden are administrative (and legal) issues for the company as well as for the student (like GDPR, tax related issues etc.)
- There is lack for incentives (mainly tax and stipend area was mentioned) for companies and students

Improvement opportunities seen by universities:

- State funds could be introduced to cover costs of companies (tutors)
- Stipend for students could be provided for working in companies (state provided as well as company provided)
- Administrative capacities should be developed for covering student and company tasks
- *(universities pointed to the project "Universities as engines of growth…"), which was perceived as a good model, but later not used for broadening in the project developed procedures for administration, organization, cost covering of tutors etc.)*

THE PROFESSIONALLY ORIENTED BACHALOR'S DEGREE PROGRAMS

This is a freshly starting form of programs, with recently introduced legal framework and available support through EU structural funds to universities who decide to develop new curricula.

Opinions on the programs are highly differentiated:

- From open to developing this kind of programs (at the moment as pilots 2 to 6 per University, using in part EU funds covering initial costs), including close cooperation with (mostly) regional employers (industry only)
- To refusing these types of programs as not suited for university level (viewed as rather higher secondary education, with lack of tradition, potentially downgrading the institution providing it)

THE PROFESSIONALLY ORIENTED BACHALOR'S DEGREE PROGRAMS

Opportunities percieved:

- Close cooperation with employers, adjusting education to their needs – resulting good employability for graduates
- Large time volume for practical skills development during apprenticeship in companies (on-the-job-training)
- Curricula development in co-working with employers show also the need for including foreign language skills boost as well as focus on transferable (soft and hard) skills
- Some academic officers envision these type of programs as a future opportunity for those schools, who will not meet higher scientific criteria set in the expected standards framework, which wil be designed by the newly established Accreditation Agency
- Stipend for students during practical work in company (if reaching e.g. 600 EUR) can be a motivator (in general these programs could channel more private funds to HE)
- Some universities see the urgency for introducing this type of programs and are submitting at least few quickly for accreditation (without long lasting EU fund support)

THE PROFESSIONALLY ORIENTED BACHALOR'S DEGREE PROGRAMS

Threats and risks perceived:

Two main obstacles may impact interest of students:

- The labour market is not offering positions for bachelors, nor professionally oriented bachelors - seen as part of prevailing public opinion on „complete higher education" equalling secondary (Masters) level
- The (implicitly by law) required 4 years for this type of program may be not as attractive for students, compared to all other programs requiring only 3 years of study for a Bachelor's degree (in over 90% of cases being just an entry to a secondary level 2 year long program)

- In general offering of a program which is longer and does not clearly provide the streight forward opportunity to finish also second level of university study can mean, that „students will slect a different program and/or school"

THE PROFESSIONALLY ORIENTED BACHALOR'S DEGREE PROGRAMS

Further risks mentioned:

- The status of the institution (as a scientific university) will be downgraded by including professionally oriented bachalor's degree programs
- Only large companies have the capacity to become partners for professionally oriented bachelor's programs
- Students will not enroll, they will choose schools where they see five years of study offerings – will even more often choose to study abroad or continue study at another school if no second level is offered to them after finishing the bachelor's degree
- The low level of knowledge and skills acquired at secondary school contribute to stressing theoretical education (in math and sciences) during the first two years of university study and practical/applied/job related skills are acquired rather at second level of study – this is an obstacle to a professionally oriented program at bachelor's level (some say "5 years are necessary to get at least minimum quality threshold meeting graduates"

THE PROFESSIONALLY ORIENTED BACHALOR'S DEGREE PROGRAMS

Opportunities for improvements:

- It should be up to the school, if the program will be three, three and a half, or four years long (at present not possible due to implicit requirements of law)
- Large scale communication campaign to public and specifically to study candidates from the side of employers should prove the interest on this type of graduates – trust in employability has to be developed and proven
- Regional cooperation with key industry players has to be agreed (large enough and in close proximity)
- Good cooperation with secondary level schools has to provide suited candidates
- Any threat of second level university study continuation should be abolished (other motivations have to drive the graduate to accept a job after acquiring bachelor's degree)

EXAMPLE OF BEST PRACTICE

Creating a professional bachelors program:

- Regional companies were consulted and a memorandum of cooperation signed
- Capacity for graduates a available facilities and staff for training were researched and agreed
- Mixed working groups of university lecturers and experts from business worked together to define priorities for curricula
- According to these priorities topics, contents, forms of learning were proposed
- E.g. complete third year of study will be in form of practical training in the company, foreign language training in the course of study includes also 3-5 applied subjects taught in English (at least one during the second and fourth year of study), representatives from the company side will participate in the selection process, a common basis of the curriculum for all students in the program will be in later stages diversified due to specific needs of specific partner employers (down to a number of 2 students following one “company profile”)

CONTEXT FINDINGS

Further opinions mentioned:

– also in context of the requirement formulated by the Ministry of Education to restructure programs and offer a larger proportion of Bachelor‘s graduates not continuing to second level of study and in the context of the freshly established Accreditation Agency, starting work:

- In general most (but not all) respondents agree with the necessity to “produce” more bachelor’s degree graduates and less master’s level graduates (as is usual in other countries) – but the conditions, environment and public opinion are not ready for this step (nor are the employers offering positions in this structure)
- There is no guarantee from the Ministry of Education, that “if we restructure” to higher proportion of bachelor’s only graduates (as presently required under “threat” of loosing part of yearly subsidy in hundreds of thousands Euro), the future financial losses will be compensated (or there will be no future negative financing impacts) – the lack of a longer term financial model for universities (regarding the state subsidy) is a major threat, an issue to be solved (!)
- Some respondents agree, that a form of a numerus clausus for qualification levels and study majors could be introduced as a solution to the structural problem (the state will finance only a specific number of “ordered” graduates)

CONTEXT FINDINGS

Further opinions mentioned

– also in context of the requirement formulated by the Ministry of Education to restructure programs and offer a larger proportion of Bachelor‘s graduates not continuing to second level of study and in the context of the freshly established Accreditation Agency, starting work:

- High expectations are directed toward the Accreditation Agency in the area of defining standards for assessing quality – which should lead also to diversification of HE institutions and programs focus (though doubts on real capacity to take action and prove independence are also present)
- Integration of institutions was mentioned as one probable process contributing to diversification in the future
- Targeted financial stimulation could also contribute to differentiation of HE institutions profiles (missions)
- Internal governance structures in HE are indicated as a potential obstacle to structural changes
- A major factor impacting the offer of programs, quality and learning outcomes, as well as the readiness to conduct reforms and changes is the exodus of talent to study abroad (schools do not see leverages to turn the trend around, perceive a state supported draining mechanism from Czech schools, are frustrated by prevailing negative information of media about Slovak universities…) – in most cases universities fear that changing their offer could mean even more students would leave to study elsewhere

3. WORKSHOPS WITH EMPLOYERS' REPRESENTATIVES

SUMMARY FROM WORKSHOPS WITH EMPLOYERS' REPRESENTATIVES

Focus of the workshops:

The freshly introduced legislative framework for study programs leading to a professionally oriented bachelor's degree were examined from the point of view of respondents.

Structure of respondents included representatives from:

- Production and Industry
- Logistics
- Services
- IT and ICT development

SUMMARY FROM WORKSHOPS WITH EMPLOYERS' REPRESENTATIVES

85% agree, that positions suitable for professionally oriented bachelors exist in their companies

In average 40% of positions requiring higher education could be saturated by professionally oriented bachelors (range was 20% to 80%)

Examples of suitable positions included e.g.:

Technologist, logistics operator/manager, quality control, quality planning, head of measurements, IT specialist of different focus, IT applications technician, programmer, mechatronic, production management positions, coordinator of production systems, head of service team, head of department, project manager, project manager of construction site ...

SUMMARY FROM WORKSHOPS WITH EMPLOYERS' REPRESENTATIVES

Faculties from which graduates would be expect include:

Machinery, IT, Electrotechnics, Construction, Agriculture, Logistics (missing!), Business Management

Employers would expect in average 30% of education allocated with companies (range was 20 to 40%).

100% of respondents agreed that employers should be equally included in the process of study program quality management.

SUMMARY FROM WORKSHOPS WITH EMPLOYERS' REPRESENTATIVES

Employers would prefer following distribution of focus in skills development during education:

SKILL CLUSTER	%
Professional theoretical knowledge (understanding the theoretical foundations of the disciplines)	16
Professional applied knowledge (understanding where, how and why the theory is applied, used)	20
Professional skills (ability to achieve result, realize knowledge based work and application)	18
Knowledge and skills related to the processes of employers and business environments (understanding of the organization's operations and business operation)	19
Transferable skills – hard (universally applicable – e.g. ICT, project management, management processes, languages ...)	15
Transferable skills – soft (universally applicable – e.g. social, cooperative, communication, intercultural ...)	12

SUMMARY FROM WORKSHOPS WITH EMPLOYERS' REPRESENTATIVES

Percentage of employers who perceive the following barriers as strongly impacting the emergence of professionally oriented bachelor's degree programs?

STRONG BARRIERS	%
Employers do not offer this kind of position	29
Employers are unwilling to financially support such programs	0
Employers cannot cooperate effectively with HEIs to prepare such programs	43
Employers do not have staff to prepare and implement such programs	29
HEIs are unable to cooperate effectively with employers in the preparation of such programs	57
HEIs are unwilling to open such programs because of adverse financial impacts	100
HEIs are unwilling to open such programs even if it is not related to financial implications	14
HEIs do not have the staff to prepare and implement such programs	14
HEIs do not understand business environment	57
Business doesn't understand HEIs' environment	14
Students lack interest in such programs	29
Public opinion considers the "complete university education" to be only the second degree (MA., MSc.)	57
Changes in accreditation procedures are too cumbersome	43

SUMMARY FROM WORKSHOPS WITH EMPLOYERS' REPRESENTATIVES

Percentage of employers who expect following motivators as potentially most effective for creating professionally oriented bachelor's degree programs:

MOTIVATORS	%
A change in how HEIs are funded	71
Change in accreditation of university programs	57
Change in public opinion regarding the attractiveness of professionally oriented programs	44
A change in the interest of students regarding STEM programs (technically and science-oriented)	55
The ability of HEIs to present themselves in attractive way	44
Employers' communication of interest and job opportunities	29
Targeted scholarship programs	70
Stronger linking of university management to external environment (representation of non-academics in university management)	42
Stronger economic links between universities and the external environment (private equity in equipment, research, projects ...)	43

SUMMARY FROM WORKSHOPS WITH EMPLOYERS' REPRESENTATIVES

During the discussion about motivators following opinions also emerged:

- Motivation impacting future students must start already at primary and secondary school level – through interactive education, workshops, inclusion in projects, excursion in companies and in universities
- Teaching methods and style for mathematics (and sciences) has to be changed – present methods create fear and tendency to avoid these subjects if options are available

- Motivating schools – financing, support in image campaigns, PR for results

- Motivation employers/businesses – enough information on these study programs and on benefits if they cooperate and acquire graduates

4. STUDENT SURVEY SELECTED RESULTS

SUMMARY FROM SECONDARY DATA ANALYSIS FROM STUDENT SURVEY

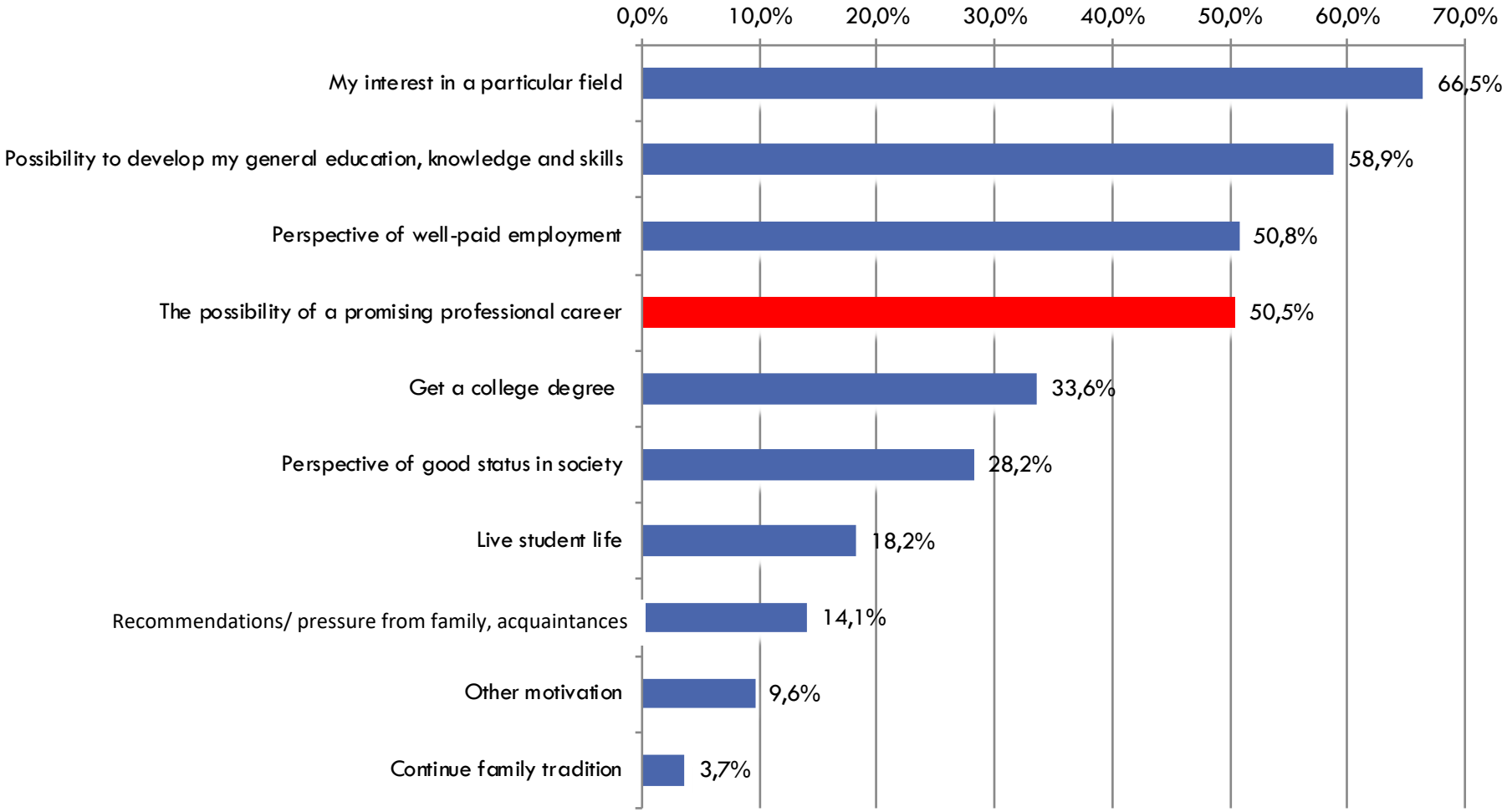
The primary data were acquired from the Centre of Education Management at Comenius University in Bratislava.

The survey covered more then 5000 respondents from 33 HE institutions in Slovakia.

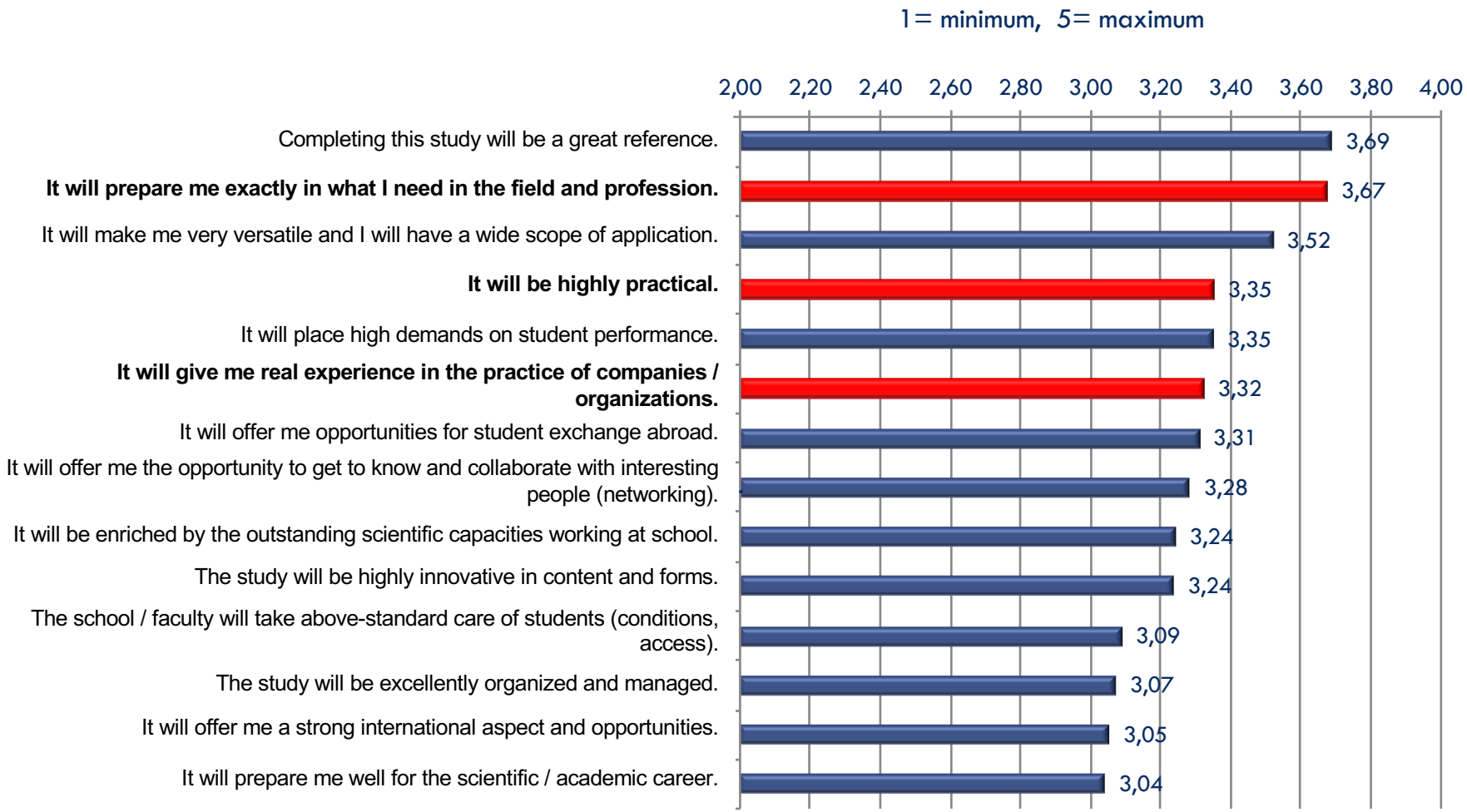
For the purpose of our secondary data analysis we have selected topics relevant to professionally alligned education.

Colored (bolded) items were selected as most relevant to the study topic.

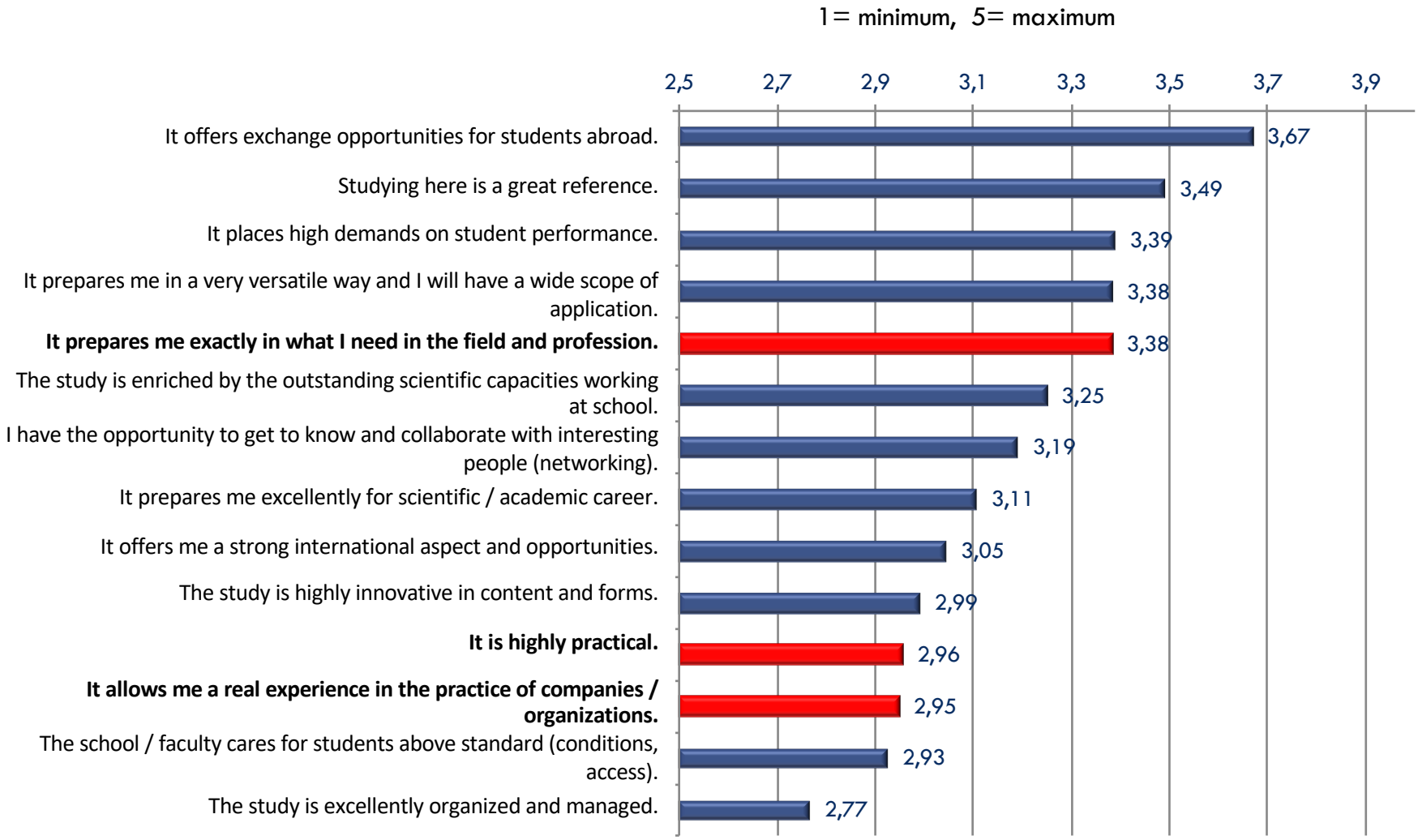
WHAT MOTIVATED YOU MOST TO STUDY AT UNIVERSITY?



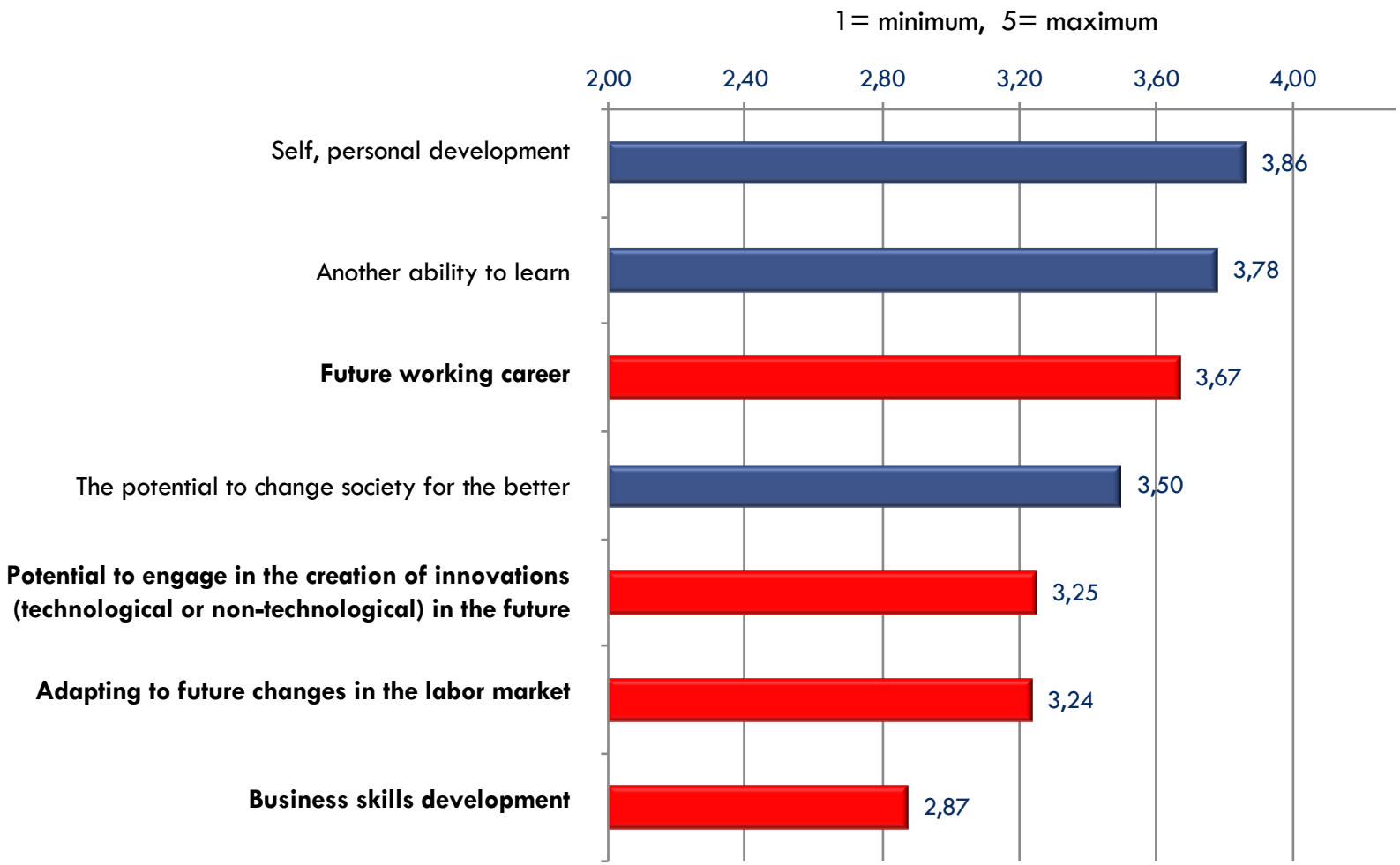
TO WHAT EXTENT WAS YOUR SCHOOL/ FACULTY CHOICE AFFECTED BY THE FOLLOWING EXPECTATIONS FROM YOUR STUDIES?



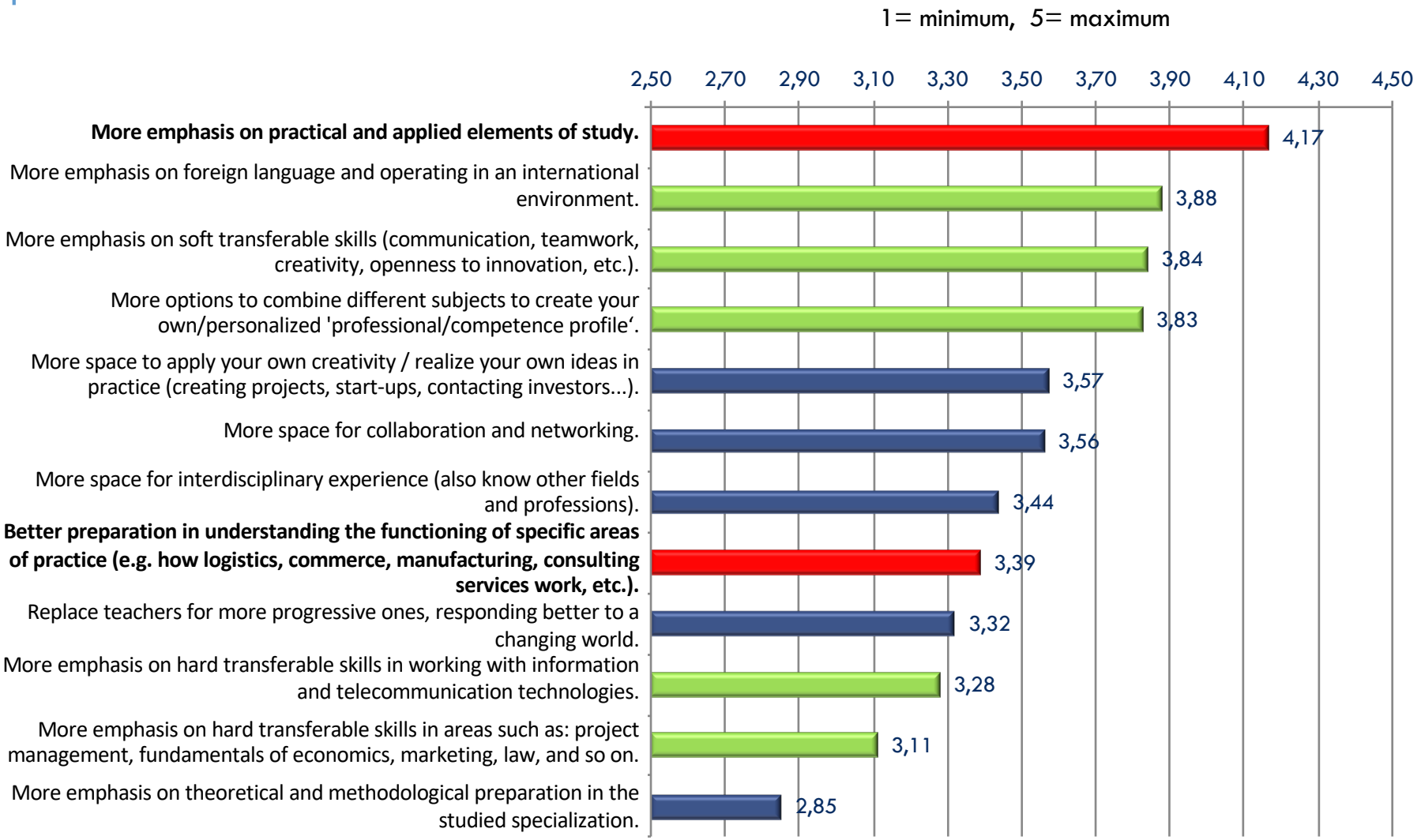
TO WHAT EXTENT DOES YOUR REAL STUDY EXPERIENCE REFLECT THE FOLLOWING QUALITIES?



TO WHAT EXTENT IS YOUR STUDY A GOOD BASIS FOR:

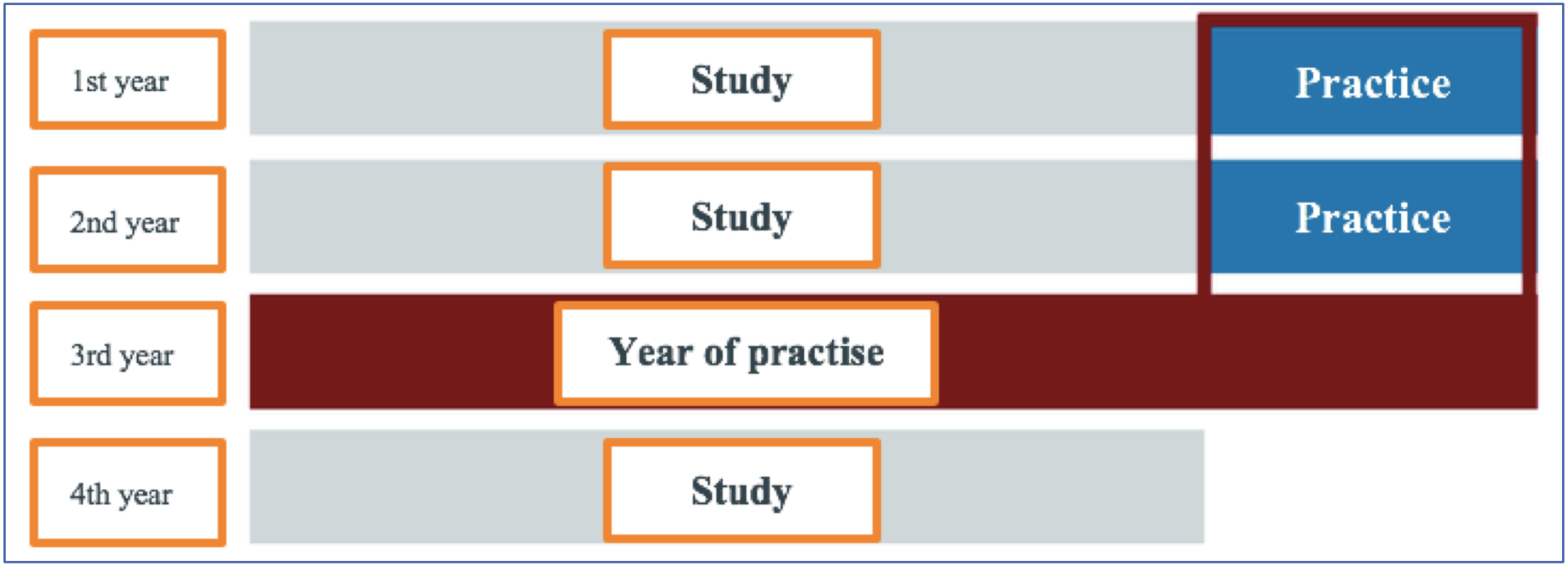


CONSIDER WHAT YOU EXPECT TO BE NECESSARY FOR A SUCCESSFUL CAREER. HOW COULD HIGHER EDUCATION BE IMPROVED IN YOUR FIELD AND FACULTY GIVEN YOUR EXPECTATIONS?



5. SUMMARY FROM FEED-BACK ON IMPLEMENTED PILOT

STUDY PROGRAM SCHEEME IN THE PILOT



Source – Volkswagen Slovakia

KEY FINDINGS

- Both, the university (*Faculty of Mechanical Engineering at Slovak Technical University in Bratislava*), as well as the partnering employer (*Volkswagen Slovakia*) are reflecting on the program as well functioning, properly designed and implemented, including readiness to flexible adaptation/innovation of the program based on current experience.

- Potential improvements are being detected in the structure of subjects, applied methods, as well as in the organization of study.

- The program proves to be highly demanding on students – even more demanding than other bachelor's level programs at the same school. Mainly in terms of time pressure (more intense schedule) and in terms of mastering in parallel highly demanding subjects (like mathematics or physics) and above that a lot of practical/applied activity.

KEY FINDINGS

- Competencies, which are the most challenging to master (at high quality level) are mathematics (physics), transferable soft skills (including foreign language, project management, presentation skills). Here new solutions are being developed to improve students' performance.

- The student feed-back is very positive on the applied/practical part of study (even demanding a stronger emphasis/time volume in preparation on this part).

- Especially the mentoring element (each student has an individual mentor among company managers) proves to be of high success (not only valued by students as very beneficial and motivating, but as well valued by managers as a great opportunity to understand better the potentially incoming generation of employees and their study experience). Mentoring is a more motivating element for students then financial remuneration (stipend) from the employer side.

OTHER VALUABLE EXPERIENCE

- Perceived as a key burden at present stage of implementation is the unsolved legal framework in the tax area, which should bring relief to employer as well as student related to the income of students – stipend (at present this is taxed like any other employment income, resulting in higher cost for employer and lower net income for student).

- Under the present set up it is obvious, that only bigger size employers will have the capacity (HR, time, financial) to get involved in this kind of programs. Another important element is the regional proximity of partners (school and employers).

- The low number of enrolled students in parallel to a number of different employers as partners to one study program creates high demands on costs efficiency in subject specialization of student subgroups.

OTHER VALUABLE EXPERIENCE

- As the programs result to be more demanding when compared to other programs at the same school/faculty, it becomes an issue to have a mechanism ready to enable drop off students to continue university study in other programs.

- In terms of new students acquisition it will be important to communicate strongly in general public (mainly from the side of employers) that a graduate from this type of bachelors' program (first level university program) is more valuable compared to a secondary level graduate (with Ing. – masters equivalent degree) from any other program.

- It is also important to persuade the public and future applicants, that it is a myth, that graduates from this kind of professionally oriented programs could not continue in second level of university study.

OTHER VALUABLE EXPERIENCE

- There is agreement on the potentially most favorable solution for student acquisition which would consist of active search by company at secondary school level for applicants who show interest and seem to have the potential to study a program that would "send them directly" to this employer after graduation.

- In general, a closer cooperation with secondary schools would foster future quality of students and programs (but at present there is lack of capacity and funds to get involved in such a cooperation).

- The differences between graduates from generally oriented ("gymnázium") and vocational secondary schools ("stredná odborná škola") will create problems also for future programs – quite significant differences in capacity to master theoretical subjects (like mathematics) on one hand and to get excited, interested and master the production related education on the other hand are obvious and will probably prevail.

6. IMPACT ANALYSIS RESULTS

SCOPE OF IMPACT ANALYSIS

- The impact analysis is focusing at the description of developments, which can be recognized in the Slovak HE sector due to activities and in context of the activities conducted in course of the EDU LAB project.

- Main focus remains at the antecedents and implementation of professionally oriented bachelor‘s degree study programs.

THE FACTOR WITH HIGHEST IMPACT

It appears that the **most impacting driver for change** is the pilot implementation of the first study program in the form of a professionally oriented bachelor's degree study program and its continuation with new set of partners in year/volume 2.

Based on this implementation experience most relevant feed-back on many fundamental areas can be drown:

- Design - time proportions, crediting system, skills lack/boost/focus, methods, staffing, complementarity of employer/school in the education…
- Acquisition of students – risks, myths to be overcome, secondary school approach, communication needs on future employability, value of graduates on the labour market…
- Necessary legal changes – taxation, legal relationship of student – employer if remuneration is concerned

The immediate enabling factor for this high impact driver can be seen in regulatory changes and intensive communication of employee representatives and government officials. But there is a set of other supporting elements making the positive changes happen, as we describe here below.

NEXT POWERFUL POSITIVE IMPACT FACTORS

- HE legal and normative changes supporting the accreditation and implementation of professionally oriented bachelor‘s degree study programs.
- Clear ambition of the Ministry of education to motivate universities to implement professionally oriented bachelor‘s degree study programs and to change structure of graduates in favor of a higher number of bachelors leaving for jobs and a lower number continuing study at second level. Mainly financial tools became an issue.
- Support scheme financed from EU structural funds for preparing and implementing professionally oriented bachelor‘s degree study programs as well as for support in practically aligned education.

NEXT POWERFUL POSITIVE IMPACT FACTORS

- Pro-active communication of employers' representative bodies toward government and HE representatives on necessary progress in the field.
- Fact based argumentation base for solutions resulting from analytical data on labour market development as well as on HE sector development and international benchmarking.

KEY PROGRESS IN RECENT DEVELOPMENT AND REFLECTION OF OBSTACLES/CHALLENGES

- Employers have communicated at multiple levels and platforms the urgency of changes in HE institutions performance – education process including more practical skills training (including transferable skills), provide newly designed professionally oriented bachelor‘s degree study programs, better fit labour market needs.

- First professionally oriented bachelor‘s degree study program is implemented already in second year, very specific “real life” experience can be used to optimize this one as well as further programs to be designed.

- Minimum of four other HE institutions with technical profile have submitted or are working on submitting professionally oriented bachelor‘s degree study programs. Most are using the opportunity to apply for EU structural funds support.

KEY PROGRESS IN RECENT DEVELOPMENT AND REFLECTION OF OBSTACLES/CHALLENGES

- Employers still perceive a number of quite intensive obstacles/barriers: highly differentiated commitment of HE institutions to agree and collaborate on required changes, financing system for HE institutions not supporting necessary changes, lack of legal changes in taxation of student income during work in companies – for companies as well as payment recipients, myths and stereotypes in public opinion – degrading bachelor's program graduates as not well employable and without prospects to continue education at second university level, degrading professionally oriented bachelor's degree study programs as non-academic, rather higher secondary education. On the other hand all of these obstacles for the emergence of new programs are being discussed and worked on and employers are ready to cooperate with HE institutions, participate in programs, provide positions/jobs for graduates and gradually optimize solutions.

KEY PROGRESS IN RECENT DEVELOPMENT AND REFLECTION OF OBSTACLES/CHALLENGES

- One of the most significant legal obstacles remains the change in tax law according to stipends paid by employers to students – changes should bring relief to cost of employer and benefit net income of student.

- Officers representing universities with STEM programs are in majority quite intensively cooperating with employers to adjust content of education to employers‘ needs, are looking for ways to improve the applied character of study and proportion of practical training for students. Most are open to the implementation of professionally oriented bachelor‘s degree study programs, but there is a minority perceiving these as a threat to universities (downgrading their status/education level, as mentioned already above).

KEY PROGRESS IN RECENT DEVELOPMENT AND REFLECTION OF OBSTACLES/CHALLENGES

- University respondents agree on necessary changes in conditions, under which these programs should emerge - e.g. no financial pressure from Ministry of Education, predictability of financial resources for longer future, clear messages from labour market that graduates of these programs are well employable, flexibility in length of the programs – not only 4 years choice, capacity of employers to provide long term practical training in companies and adjustment of legal framework concerning stipends and taxes...

- Students expect more practical training, applied knowledge and transferable skills, including capacity to act in cross-cultural settings. It is remarkable how perfectly the reflections of students on necessary improvements in their study programs fit the priorities communicated by employers on the same subject.

KEY PROGRESS IN RECENT DEVELOPMENT AND REFLECTION OF OBSTACLES/CHALLENGES

- Students are interested in apprenticeships relevant to their education, but are not always able to cope with the administrative burden put on them.

- Students already enrolled in professionally oriented bachelor‘s degree study programs describe these as highly demanding (more if compared to other bachelor’s programs), value positively mainly the practical/applied part of study and especially the element of mentoring (from assigned company manager).

- Government representatives have tackled several issues in response to presented data, trends and (mainly) employers’ argumentation. Legislative changes were implemented, which define conditions for professionally oriented bachelor‘s degree study programs.

KEY PROGRESS IN RECENT DEVELOPMENT AND REFLECTION OF OBSTACLES/CHALLENGES

- These were followed by requirements to change the structure of graduates (increase proportion of bachelors in comparison to number of second (masters) level graduates leaving for the labour market– using financial pressure on HE institutions (which did cause frictions and may now be changed after several discussion rounds with universities).

- Government has also introduced (despite longer delay and in limited extent) EU structural funds, offered to support preparation and implementation of professionally oriented bachelor‘s degree study programs and to support practical training of students.

KEY PROGRESS IN RECENT DEVELOPMENT AND REFLECTION OF OBSTACLES/CHALLENGES

- For employers as well as HE institutions the lack of student (applicants) interest in demanding and professionally oriented programs remains a major threat. Innovative approaches to cooperation with secondary schools are being considered.

- Another major issue limiting the efficiency of technical education (concerning not only professionally oriented bachelor‘s degree study programs) is the decreasing level of knowledge and skills in secondary school graduates – incoming students (mainly in math, science, foreign language skills) and the capacity to improve this deficit during university study.