

**RePro
Project**

Real-Life Business Projects in
Multicultural Student Centered Learning



INDUSTRY AND ACADEMIA LINKS FOR STUDENT-CENTRED LEARNING: A SITUATIONAL ANALYSIS OF THE REPRO PROJECT PARTNERS

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1. Introduction

In the context of the Repro Project a situational analysis in all partner institutions was agreed in order for the partners to acquire a common understanding of views and practices as well as develop a common “language” with regards to student-centred learning.

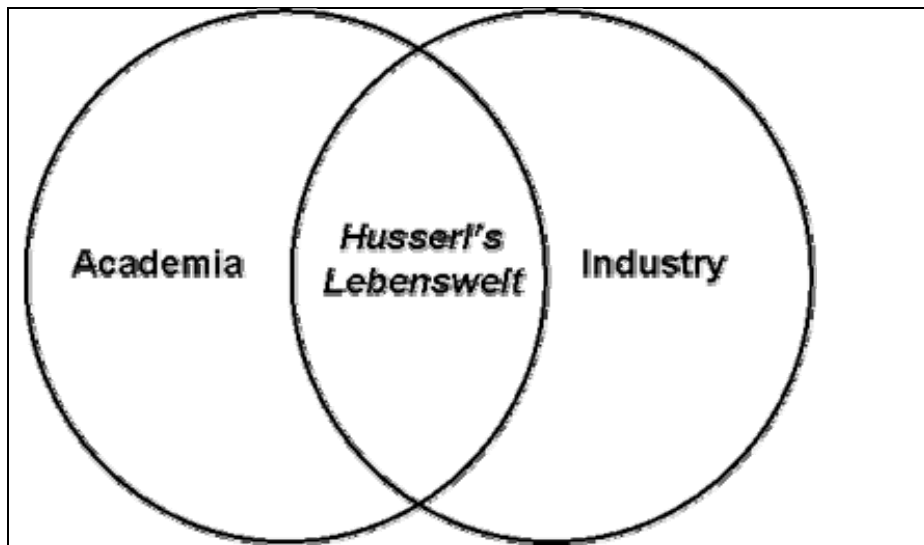
During the project launch meeting in Kuopio the responsibility for the situational analysis was divided between Häme Polytechnic University of Applied Sciences (Rasinkangas, 2005) on the one side – with regards to a literature review and the preparation of a report that would enable all partners to understand what student-centred learning is and how this is applied in an academic context– and Oxford Brookes University and Tekstrategy on the other – aiming at an evaluation of the extent to which various industry/academia links enhance student-centred learning.

2. Rationale

Throughout the EU, there is a shift of thinking about the role of higher education and their potential to contribute to the creation of a skilled and educated workforce. Increasingly we are witnessing historic boundaries between vocational and academic education breaking down and the formations of strong links (even explicit partnerships) between higher education institutions and the worlds of industry, commerce and public service (Dearing report, 1997:1) and curricula are being reviewed towards new outcomes for graduates, in the light of industry expectations and demands.

At the same time, the pedagogic thinking has shifted considerably in terms of the “location” of knowledge construction. Progressively more educators talk about students’ “lived experiences”, a term derived from Husserl’s notion of the “*lebenswelt*” or “life-world” (Ströker, 1979). This is the everyday, intuitive, world of our day to day experience, in contrast to the idealized, cognitive world of the sciences and mathematics. In Husserl’s thinking, the “life-world” refers to both the experiential world of perception, or intuition - that which grounds our activities and interests, as well as the world as a whole - or that which encompasses the multiplicity of particular worlds. These worlds could be represented in Fig 1.

Fig. 1 – “Lebenswelt” in Higher Education



While the old teaching paradigm was that classroom teaching is a preparation for a lived experience, the new paradigm suggests that the classroom provides the opportunity to reflect on, and reconstruct the lived experience from the industry world (Van Manen, 1990).

Another considerable change in the higher education pedagogic thinking has to do with the students' autonomy and control over choice of subject matter, learning methods and pace of study in their learning (Gibbs, 1992). Students are increasingly expected to assume a high level of responsibility in the learning situation and be actively choosing their goals and managing their learning. They are encouraged to no longer rely on the lecturer to tell them what, how, where and when to think. Exposure in an industry-related environment offers a significant opportunity for such learning (Stasz & Kaganoff, 1997).

Student-centred learning forms part of an underdeveloped area within vocational learning and provides scope for further exploration. Since the Re-Pro project is all about the development of an innovative approach to teaching based on real industry problems, it was deemed important to explore to what degree existing academia/industry links enhance student learning. This research was conducted on a multi-cultural basis across Europe to enhance the scope of the project.

3. Industry/Academia Links: A Review of the Extant Literature

The benefits of a wide range of strategic partnerships between universities/vocational institutes and industry have long been verified and continue to be supported by governments, academics and corporate executives (Carboni, 1992; Figgis, 1998; Valentin & Sanchez, 2002). In their majority, both in the US (Hall, Link & Scott, 2003) and in the EU (Caloghirou, Tsakanikas & Vonortas, 2001) these partnerships are mainly focused in joint research ventures. However, in the last decade this collaboration is extended to the educational function of universities with the industry being actually involved in

curriculum design (Mergen, Grant & Widrick, 2000) and even in teaching and assessment (McLoughlin & Luca, 2002).

Various forms of industry-academia links are used to transfer learning outside the cloistered context of a classroom. McLoughlin and Luca (2002) contend that partnerships with industry help create purpose and meaning in learning activities leading to development of the skills that enhance the employability of graduates. Students have the opportunity to gain experience by liaising with industry practitioners and the practitioners themselves also benefit by the reciprocal relationship and exchange of knowledge. This becomes a learning transaction, which is founded and developed on the notion of a *real-life* partnership where the control and the construction of learning are predominantly in the hands (mind) of the student (*student-centred learning*). Students can relate their experiences to prior knowledge (acquired in the classroom or elsewhere), interpret these experiences through the analysis, synthesis and evaluation of others' (industry practitioners or peers) understandings and to make inferences by generalising their understanding and knowledge so that it is applicable in different contexts (Driscoll, 2000).

One of the most common practices of industry-academia collaboration aiming at the development of student learning experience is the development of a *work-based learning* programme (Petherbridge, 1997). This normally refers to placement of students in a work environment to gain relevant experience pertinent to student developmental learning needs. In its simplest form can be the provision from the part of the industry partner of facilities (e.g. labs) that teachers and students can use to simulate or actually create "real-life" experiences. Apart from being an alternative and equally valid way to construct practical knowledge and skills, work based learning also recognises the intellectual and hence academic legitimacy of critical thought leading to critical action. Barnett (1997) highlights this as the hallmark of higher level learning through imitation and social negotiation within the context of "bounded rationality" provided by the imperatives of the real life situation (Laland, 2001). In such a context, the solution to a real life problem may not have been the result of "thorough research" but found out within the constraints of the time and resources available to take critical action based upon critical thought.

Although there is significant published research on the channels of knowledge transfer from university to industry the literature on the opposite direction (industry to university) is scarce. One traditional practice for this is for an industry person to present current business topics to student audience in the form of a lecture, talk, discussion forum, careers presentation, etc. Industry guest lectures help provide a real world perspective on classroom learning. Mills-Jones (1999:631) argues that this practice enables students to see real-life applications of the theories and concepts taught in the class, reassures them that what they learn is useable and often the speaker or the topic acts as a source of inspiration for them.

Increasingly the industry is engaged in different forms of higher education funding, usually in the form of chaired professorships, career development endowments, studentships and research fellowships. These contributions

from industry are attracted when a "value return" to the corporation is apparent, in exchange for the funds and resources provided. Usually these returns can range from just enhancing of corporate image, to access to innovative knowledge and thinking or even to complete ownership of patents and intellectual property (Feldman & Desrochers, 2003). From the student perspective, involvement in industry sponsored-research is beneficial not only in terms of knowledge acquired through the research experience but also because in these projects they have more freedom of action as opposed to government-sponsored projects where they are more likely to be closely supervised by a member of the faculty (Behrens & Gray, 2001).

In addition to the above, the review of a significant body of university promotional literature with regards to industry sponsorships revealed the following practices:

- Industry-sponsored student development funds/endowments aiming at supporting student attendance at paper sessions, workshops, symposia, laboratories and other sanctioned meetings during their studies or other initiatives aiming at their personal development such as study abroad programmes, etc.
- Industry-sponsored competitions that provide opportunities to showcase students' achievements in an area of their interest, and
- Facilitation of student access to the industry partner in order for them to collect data and information pertinent to student-driven research projects (as opposed to the above mentioned sponsored research/consultancy, which is driven by the sponsor)

Another practice that in the past three decades has become a formal and informal vehicle for empowering individuals in both educational and corporate environments is mentoring (Hueftle-Vogel, 2004). Mentorship programmes jointly developed by academic staff and the institute's industry partners, effectively match students (protégés) with professionals from industry (mentors) for the period of the programme. Once matched, the relationship between the student protégé and their mentor is allowed to develop and follow its own natural course. Research carried out on this topic concludes that such a relationship can offer significant rewards for the student through the contextualisation of their learning and also through personal development (Dutton, 2003). Mentors also gain significant personal satisfaction, with their employer organisations gaining access to vocationally aware graduates.

Higher education institutions have also established mentoring programs similar to the above but this time between university students and alumnae. Academia has recognized the importance of enhancing mentoring and networking opportunities for graduates and current students and the benefits derived from such alliances (Hueftle-Vogel, 2004). Singer and Hughey (2002) argue that alumni organizations have special opportunities to influence the experience of students. They can foster a network for educational exchanges and enhance a multidisciplinary approach in the construction of student knowledge.

4. Methodology

Research setting

The Leonardo project involves six key institutions. Data was collected from these Institutions between January and April 2005. This information formed the basis for this report.

Sample size

The project partner Institutions come from six countries: Finland, Germany, Latvia, Italy, Poland and UK. Given the nature of student-centred learning as outlined in the report prepared by Häme Polytechnic (Rasinkangas, 2005), key respondents were agreed as students (25), faculty (10) and industry (5). The three groups of respondents were asked their opinion regarding key industry/academia links that enhance student-centred learning. Faculty were selected across a variety of subject disciplines, students incorporated undergraduate students and industry respondents were selected from the generic business environment and not a specific industry.

Questionnaire Design

The methodology assumes that there are in total nine key practices associated with student/academia links, which are associated with promoting student centered learning. These were defined were necessary for ease of interpretation across the academic project partners. Academic colleagues researching in the area of student-centred learning were asked their opinion on the definitions and questionnaire format (face validity) (Bryman, 2004). Two questionnaires were produced. One was targeted at students and faculty and the other at Industry. The student/faculty questionnaire incorporated the following practices as they were presented by the reviewed literature (see section 3 of the present report):

- A. Work-Based Learning (as supervised work experience)
- B. Work-Based Learning (as realistic work environment as part of the curriculum)
- C. Guest Speakers (industry experts)
- D. Industry Sponsorship (to facilitate learning and educational development)
- E. Research Projects
- F. Consultancy Projects
- G. Sponsored Competitions and Prizes
- H. Alumni Association
- I. Industry Mentoring

The Industry questionnaire differed only in that practice B was not deemed applicable. A self-completion based questionnaire was produced using a combination of tick boxes and open-ended questions for comments. Each non-English teaching institution involved in the study was asked to translate the questionnaire where before gathering the data from the selected sample groups with return address for paper based questionnaires to the UK institution.

Limitations

The following limitations are noted:

1. Translating the questionnaire from English into the different languages presents a likely chance for misinterpretation of the questions. In this regard the aim was to keep the questions simple and provide definitions for the different practices identified.
2. This study is conducted on a multi-cultural basis across Europe. It was assumed to a great extent that, representative respondents of the participating institutions/countries would recognize some or most of the practices. However there are key differences in the size of the institutions, the educational focus and type of educational practices that are promoted in these countries, could impact on the quality of feedback on some of the practices which may not be recognized at all by students faculty or industry.

Analysis of Findings

From the questionnaire answers, the quantitative data were exported into two SPSS files (one for faculty/student responses and one for the industry responses) and analysed using simple descriptive statistics, frequencies and cross-tabulations, whereas the qualitative data were analysed with N-VIVO in order to identify common themes and patterns in the answers. The findings are presented in the next section of the report addressing the following key areas:

1. Respondent Profile
2. Practices applied within the curriculum
3. Practices that are assessed
4. Types of assessment methods used
5. Industry experts level of involvement in assessment
6. The effectiveness of the practice

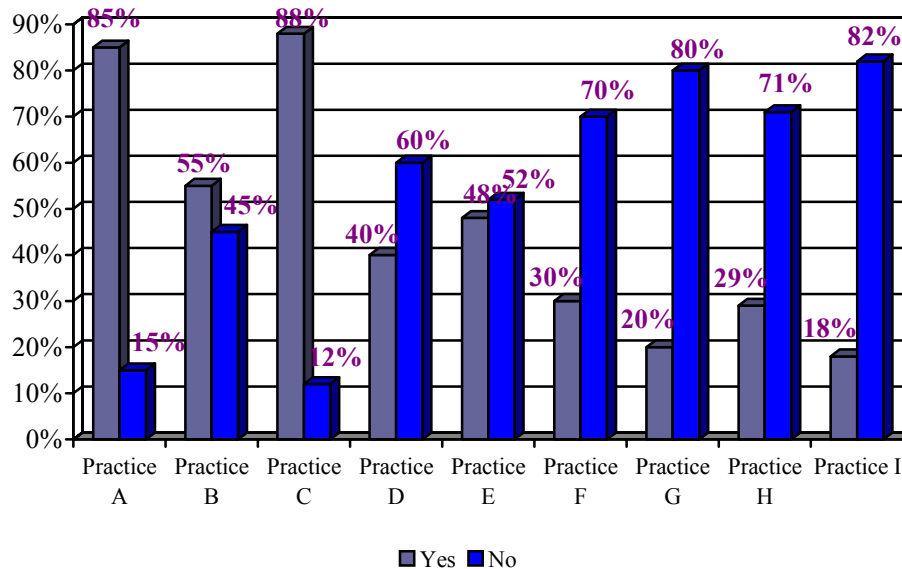
5. Key Findings and Discussion

Some institutions returned a slightly lower response whereas some others had higher than anticipated. The questionnaire enjoyed a very high response rate (96.3%) which although unusual for field research projects was not surprising – given the eagerness of the partner institutions to contribute with all their efforts in the Re-Pro project. The screening of the questionnaires yielded 206 usable faculty/student questionnaires (64 faculty members, 138 students and 4 that did not specify) and 33 usable industry questionnaires (19 from service industries, 11 from manufacturing, 2 classified themselves as both service and manufacturing and 1 classifying themselves as “other”). The distribution of responses among institutions was normal.

The most popular industry-academia partnerships used across the sample are the ones related with work-based learning and industry guest-speakers (depicted as practice A, B and C in Fig. 2). 40% of the respondents suggested that their institutions benefited from some kind of industry

sponsorship (such as scholarship or development fund – practice D) and almost half of the respondents (48%) gain access in the industry partner companies for dissertations and other student-driven projects.

Fig. 2 – Practices Used Across the Sample (N=206 Faculty/Student Responses)

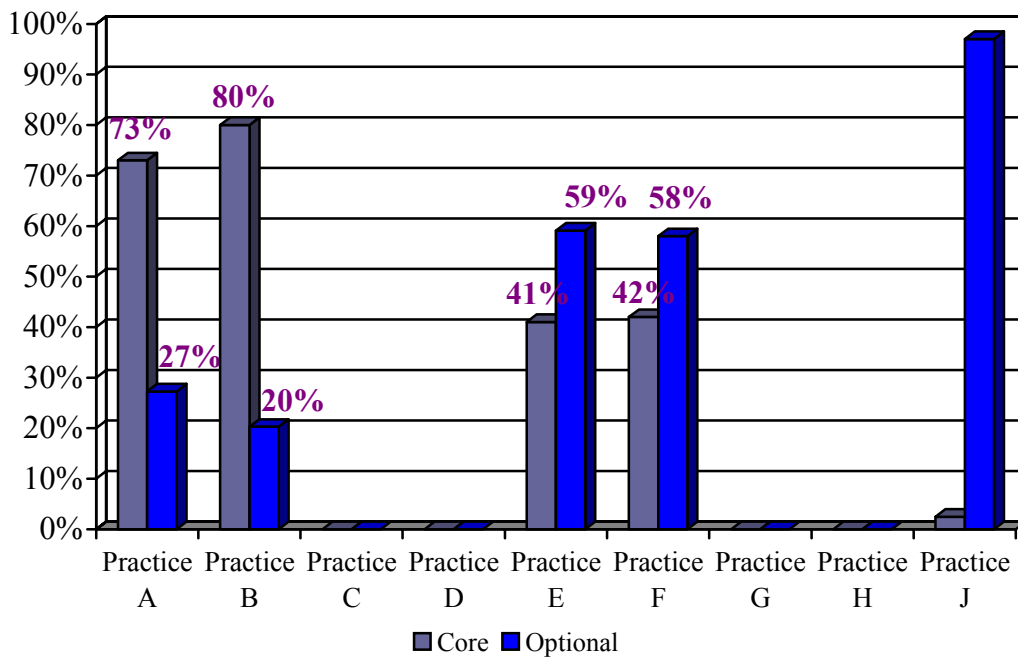


Practices F, G, H & I, i.e., consultancy projects, sponsored competitions/prizes, alumni association and industry mentoring were the least applied.

In terms of particular patterns it appears that the use of work-based learning with the sense of student industrial placement (supervised work experience), of industry guest-speakers and of access for student-driven projects is equally spread between all partners. Enrico Tossi (IT) appears to use more than the rest industrial partnerships to provide to both students and faculty facilities for teaching in a real- world environment and to create a “lived experience” to its students. Mannheim (DE) and Enrico Tossi (ITA) students also benefit the most from industry sponsorships. Mannheim (DE) and Savonia (FIN) make the best use of their industrial partnerships for their students to be invited to conduct research within the organisation and offer solutions or recommendations to particular problems that the partners face. The most positive responses in terms of sponsored events came from Gdansk (PL) and Savonia (FIN) although this was the second least used practice. Häme (FIN) and Savonia (FIN) appear to make more use of their alumni from the rest of the partners since they cumulatively had 60% of the 55 positive answers in this question. Finally Mannheim (DE) and Savonia (FIN) were the institutions from which the most positive answers with regards to the use of industry mentorship originated.

Out of all practices only the ones related with work-based learning and industry projects were core parts of the curriculum, whereas the rest of the practices were either extra-curricular or electives (Fig.3).

Fig. 3 – Core elements of the Curriculum

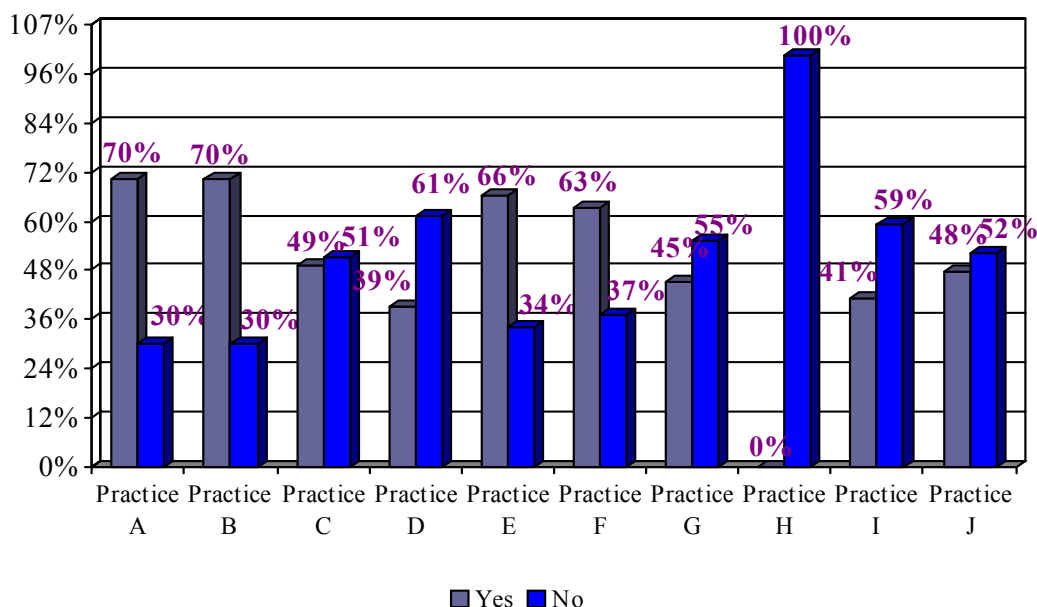


(Percentages are calculated on responses stating that the practice is applied in their institution)

In Fig. 3, it was also interesting to see that Practices E and F (student-driven research projects such as dissertations and industry-driven ones) formed core part of the curriculum in less than half of the respondents. The most common practice for industry speakers is a one-off lecture whereas 7.2% of the respondents indicated that industry experts are used as part-time teachers in their institution (predominantly in Mannheim –DE). A small amount of respondents also indicated that there are some optional networking events in their curricula, such as networking dinners or events co-organized with professional associations (Practice J).

All the practices (with the exception of alumni related events) are assessed to a sufficient degree regardless if they form a core or an elective part of the curriculum (Fig.4).

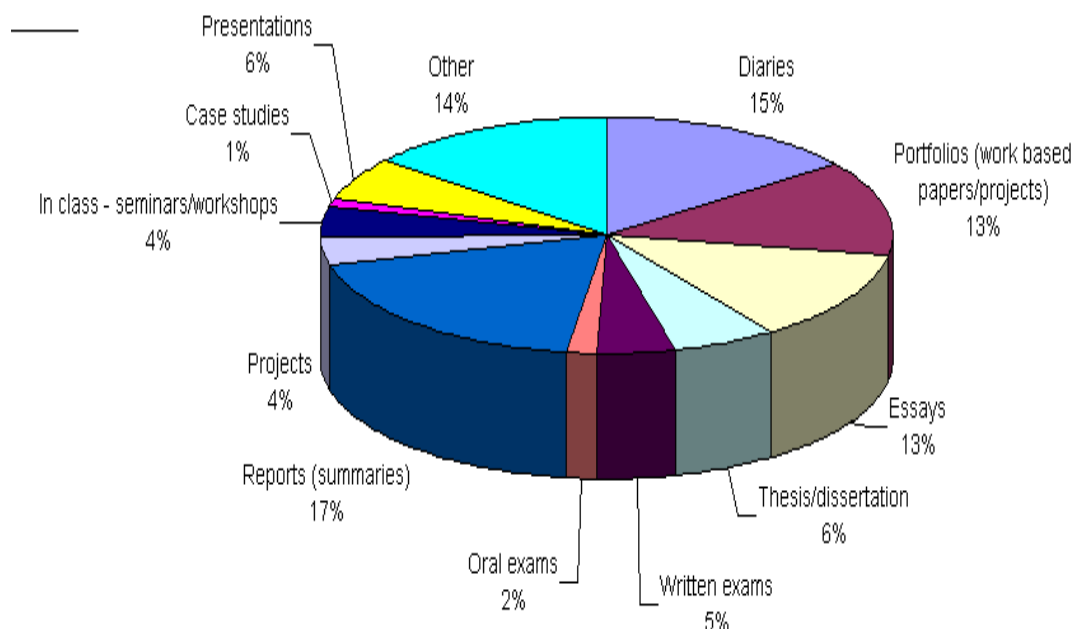
Fig.4 – Assessment of the Practice



There were some surprising results here. For example, it was expected that projects (E and F) would be more assessed (only 65 of the 98 respondents and 39 of the 62 respectively have indicated that these were assessed) whereas “other” practices (reported in J), although overwhelmingly not part of the core curriculum, showed a high percentage of assessment (19 out of 40 respondents said that these are assessed). In terms of patterns in this question it appears that all institutions have a similar tendency to assess the industry-related practices with Mannheim (DE) and Enrico Tossi (ITA) being slightly ahead of Rezenkes (LV), Oxford Brookes (UK) and Savonia (FIN) with almost 6 in every 10 responses being positive in terms of the assessment. Häme (FIN) and Gdansk (PL) take a more relaxed approach with 4.5 and 2.5 respondents respectively (in every 10).

As far as the methods of assessment are concerned the most popular ones across the sample appear to be the reports about the “lived experience” summarizing the main points upon which the student needs to reflect and demonstrate the construction of knowledge. Very close in to this assessment practice come the diaries and the project portfolios, with essays having equal importance (Fig. 5).

Fig. 5 – Assessment Methods Used

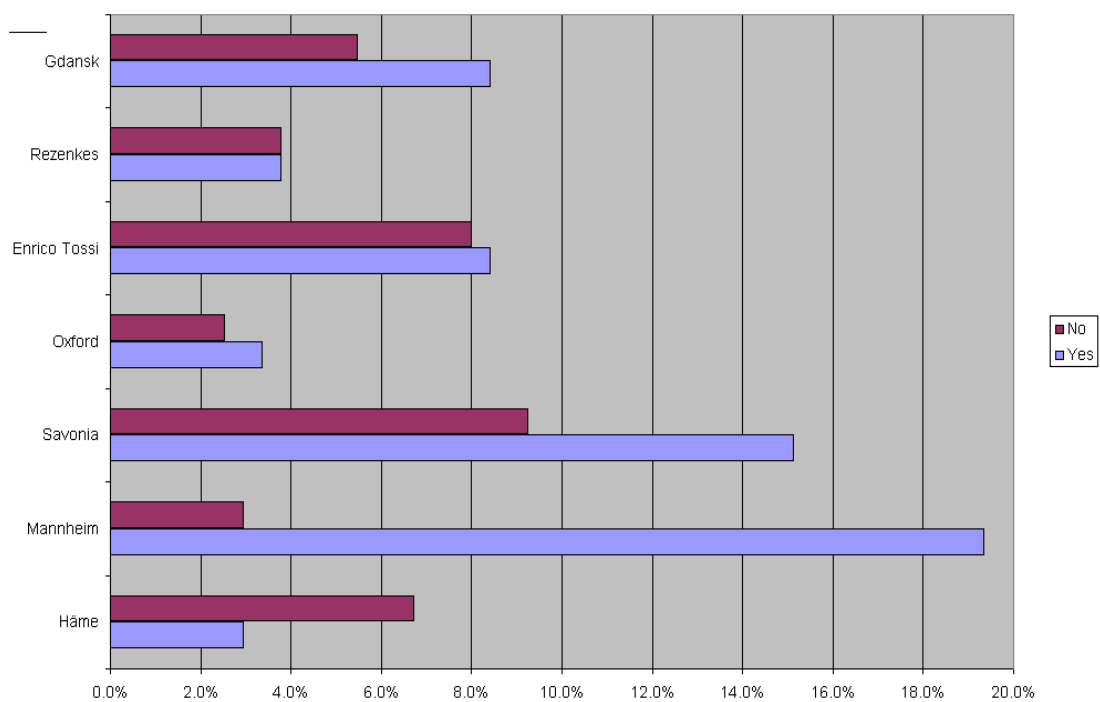


These findings are not surprising two reasons; (1) given that work-based learning appears to be a popular practice it not unusual that diaries, portfolios and reports are predominant methods assessment (2) the findings reflect the perennial problem of academia’s limited creativity in the assessment practices associated with student’s learning (Lambert & Lines, 2000). An equally interesting for the specific project is that Case Studies are only used by 1% of

the respondents showing that the development of the case studies will be quite challenging for all partner institutions. However it should also be noted that these results represent under 20% of the responses where over 80% of respondents gave no answer or indicated non applicable.

Industry involvement is also another issue that the present study attempted to explore. The research findings indicate that Mannheim (DE) is clearly leading the way here in trusting the judgment of its industrial partners, with Savonia (FIN) being quite close. Gdansk (PL) and Enrico Tossi (ITA) follow suit whereas the rest of the partners appear reluctant in involving their industrial partners in students assessment (Fig. 6)

Fig.6 – Involvement of Industry Partners in the Assessment



Finally, the study sought to determine how effective are these practices in facilitating and enabling student-centred learning, as perceived by the students, the faculty and the industry partners. Apart from the rating the respondents were asked to indicate the main reasoning behind the rating they have given.

With very few exceptions all respondents agreed that most of the current practices have the ability to enhance student-centred learning (Fig. 7). The most effective practices in the eyes of the students are the industrial placement and the projects (surprisingly the company-driven consultancy projects are slightly ahead from the student-driven ones). The members of faculty also consider consultancy projects as the most effective practice. One explanation that was given from both clusters was that these are based in real-life problems of the company and the experience acquired at the end of

the project is greater. Academics also seem to value a lot the opportunities given to them by the industry to teach in a realistic work environment as well as the studentships offered by their industrial partners. On the other hand, industry respondents appear to value their contribution as guest-speakers the most (!) as well as internship programmes. At the other end of effectiveness, although no practice was rated in overall as ineffective, students consider the Alumni offering little scope for student-centred learning, in total agreement with the faculty. The industry respondents find that competitions and allowing the academia to teach in their facilities are not quite effective practices.

Fig. 7 – Perceived Effectiveness of Practices
(4= Highly Effective, 3=Quite Effective, 2=Not Very Effective, 1=Ineffective)

Practice	Student Evaluation	Faculty Evaluation	Industry Evaluation
Supervised Work Experience/ Internship	3.3	3.3	3.5
Realistic Work Environment for teaching	3.2	3.5	2.4
Guest Speakers	2.9	3.1	3.6
Industry Sponsorship	3.1	3.4	3.4
Research Projects	3.2	3.3	3.5
Consultancy Projects	3.3	3.7	3.3
Sponsored Competitions/Prizes	2.8	3.1	2.5
Alumni Association	2.4	2.7	3.4
Industry Mentoring	3.4	3.3	3.2

Looking at each practice across the board and considering the qualitative data collected, work based learning in total appears to be the most effective practice towards student-centred learning. When it comes to SWE both faculty and students agree that this is a solid way to link theory with practice. But then views deviate as although faculty looks at SWE primarily as a means for students to better learn what was taught in the classroom, students themselves look at it more as a way to become independent and more responsible, as a “fun” escape and an additional strength for their CV. Negative ratings here were more associated to individual bad experiences

rather than the practice itself. The industry agrees and the ratings given show how highly they value this practice.

Having an industry partner to provide facilities for teaching in “real life conditions” is a practice that quite a few institutions apply. Faculty –as stated above – rate this practice as highly effective (3.5) in linking theory to practice and students agree to a great extent but state that more often than not these “visits” are not as many as they would want or they are too short in duration. The industry does not seem to agree a lot with these views and rates the practice quite low, stating that its effectiveness largely depends on the structure provided by the institutions and the students’ interest on the job.

All the industry partners rated as effective the practice of Industry guest-speakers (not surprisingly) with the highest rating. The industry believes that this way students are exposed to up-to-date, cutting edge developments and that the interaction with “real business experts” (as opposed to academics?) is highly beneficial for them. Faculty also rates this practice highly stating that students learn about current business issues and practices, enables them to link theory with practice and to see different perspectives on their prospective careers as well as other people’s achievements in their areas of interest. Students are slightly more critical here, rating the practice slightly lower than “quite effective” and stating that its effectiveness depends on the quality of the speaker. They add that in not few cases industry speakers turn-up only to advertise their company and praise themselves. Students also feel that sometimes the speakers are not so professional, they may be boring or difficult to understand.

Industry sponsorship is found as effective across the board with the students rating slightly lower than the academia and the industry. The faculty respondents had virtually no negative comments on the practice and rated it quite highly for a host of reasons, mainly because it offers financial security and motivation to the student who can concentrate on the study. They also feel that this sponsorship is an “asset” for the student future in terms of developing “links” with the industry and a positive point in their CV. Students agree with the faculty to an extent, putting however more emphasis (twice as much) on the motivational factor of the sponsorship. Still their overall rating is quite lower because, in their eyes, this practice does not offer real benefits towards student-centred learning and in some cases the learning is “dictated” by the terms of the sponsorship. Another interesting finding here was that 47% of the industry respondents stated that they are not involved in any form of sponsorship. The benefits they saw for the students are motivation and even “obligation” to study as well as the forging of a lasting relationship with the sponsor.

Granting access for student-driven research is highly rated by all parties involved with the industry giving a higher rating and stating that this allows students to get a taste of the real world. Impressively 43% of the industry respondents admitted that they are not actually involved in such a practice indicating that perhaps our institutions do not use them as effectively as they could towards this direction. The faculty respondents believe that this practice offers a practical/real life challenge for students to compare and contrast

theory with practice. They also feel that the visits to the company for data collection forge the relationship and increase the learning opportunities for the students. Students are in agreement with the above, putting however double as much emphasis on the relationship forging (future employment opportunity) and less on the learning (hence the slightly lower rating).

Consultancy company-driven projects are seen as the most effective student-centred learning practice by the faculty respondents for the same reasons as above with the addition that success/failure in the real world teaches more than books and that it is in the hands of the student to drive the project toward the one or the other direction. Either way they will learn. Students agree again but rate lower the practice as they feel that in some cases they are manipulated and that their learning is not completely a result of their choice. Again, although more than 40% of the industry respondents are not offering consulting opportunities (another gap that needs to be managed by the institutions), they stated that this is a highly effective method because students learn and develop ideas from real situations. They expressed however some concerns, which were more related with the abilities of the students and the nature of the problems to be investigated and less with the practice itself.

One of the less practiced activities is the one related with sponsored prizes and competitions. Faculty believes that it is more than just “quite effective” because it allows students show their full potential and develop their learning in they direction they wish. Students do not actually agree with that and the industry too with only 18% of industry respondents being involved in such kinds of activities.

As already mentioned, students consider the Alumni offering little scope for student-centred learning, in total agreement with the faculty, both giving quite low ratings. If, however, one looked in the industry rating, one would identify a significant gap in perceptions (student rating 2.4, faculty 2.7, industry 3.4). The obvious conclusion here is that the industry is willing to contribute but the institutions have not yet managed to get full advantage of the potential that alumni have for the development of student-centred learning.

Finally with regards to industry mentoring, the study showed that it is highly valued by all parties, with students putting some extra value on this practice. Both students and faculty feel that it offers unique insights of the business to the students whereas the faculty respondents add that this increases the student career prospects as it shows the company interest on them. More than 4 in every 10 industry respondents are actually practicing mentoring, something that the researchers find really surprising and at the same time exciting. The fact that students spend time with experienced future colleagues is highly beneficial for them.

Conclusions

Overall it would appear that practices that can enhance student-centred learning are skewed towards specifically work-based learning, guest speakers and industry sponsorship, which are predominantly driven by academic institutions. Given that Academic institutions have significant support in these

practices, there is significant scope to use this influence and extend it foster more effective use of the other practices such as student-driven projects or alumni associations which industry seem to rate as effective. This would also provide the added benefit of encouraging industry involvement in curriculum design and teaching assessment (Mergen, Grant & Widrick, 2000; McLoughlin & Luca, 2002). However it is important to identify who assumes responsibility of fostering further collaborative practices as each group (Faculty, Student and Industry) have their own demands in terms of time, allocated resources and benefits sought. On a practical level the findings have revealed that there is scope to share experiences of how to develop and maintain industrial partnerships particularly from Mannheim (DE) and Savonia (FIN).

Although the research has revealed the scope to support student-centred learning through these identified practices, question remain unanswered about the extent to which students themselves are ready to assume a higher responsibility in terms of autonomous learning (Gibbs, 1992). Equally the mixed view of assessment of practices which are core and optional provides an opportunity to explore the effectiveness of different assessment methods being applied.

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Education and Culture

Leonardo da Vinci

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