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Published in:
Populism in Higher Education Curriculum Development

DOI (link to publication from Publisher):
10.1007/978-3-030-47376-1_8

Publication date:
2020

Document Version
Publisher's PDF, also known as Version of record

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Is University Management Part of the Problem or Part of the Solution for Problem-Based Learning Development and Critical Thinking?

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Introduction

This chapter discusses opportunities and barriers for management to support and develop reflective Problem Based Learning (PBL) curricula as a response to the populist/political (read neoliberal) agendas that increasingly have influenced contemporary universities since the 1980s. At the university level these neoliberal agendas are reflected in:

- *Increasing marketization of education and science*. Public and private universities increasingly compete on a global scale for students and research funding. Study programmes that are not profitable in a narrow economic sense or supply graduates that are not in demand or directly employable in industry or public sector are closed down.

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R. V. Turcan, J. E. Reilly (eds.), *Populism and Higher Education Curriculum Development: Problem Based Learning as a Mitigating Response*,
https://doi.org/10.1007/978-3-030-47376-1_8

Funding of basic and free research at public universities is declining relatively to so-called competitive research funding. We see M&A involving universities and other higher education institutions (HEIs) in order to enhance scale and scope as a means to improve competition and climb the ranking lists. We see customer diversification in the form of specialization in mass education programmes on the one hand and niches targeting elite students and researches on the other. In other words, populist neoliberal notions of global economic competitiveness have entered the university sector (Beiter 2019; Kubler and Sayers 2010).

- *Increasing corporatism of universities and HEIs*. Corporatism is to a certain degree a logical consequence of the increasing marketization of universities and HEIs. It is manifested in governance methods blindly transferred from the private business world, including a business growth philosophy, hierarchical management systems, individual incentive mechanisms (for instance, Publish or Perish), quality audits (although mainly based on quantitative indicators), mainstreaming of administrative procedures, internal and external communication lingo, where students are customers, local businesses are partners, and other universities are competitors (Scott 2018).[1] There are not many signs supporting that corporatism and New Public Management systems have increased efficiency. On the contrary, these management regimes allocate more and more resources for administration and various layers of management at the expense of academic staff. The 'performative university' where more or less arbitrary ranking lists are used for publicity (if your university takes a step up), where promotion mainly relies on number of publications in a limited selection of top journals, where individual salary depends on ability to attract external funding, and where self-governance and collegiality is replaced by top-down management, in such a system there is a high risk that academic freedom, critical thinking, and scholarly integrity come under pressure.
- *Increasing demand for accountability and short-term impact of research.* Public funded university research should of course be relevant for soci-

[1] The 'entrepreneurial university' as a concept (Etzkowitz 2003; Clark 1998) could also be mentioned as an example of business lingo, although it has a much wider meaning.

ety and help in solving societal problems, but 'impact' and 'outcomes' have recently become buzz words that on the one hand may tempt researchers applying for external funding to oversell their potential results and on the other hand may induce risk-adverse funding agencies to give priority to short-term applied research instead of research driven by pure curiosity with no warranty of short-term societal impact. History is full of examples on how important discoveries simply emerged by accident, and there is certainly a risk that long-term innovation options will slow down due to a dry-out of the new knowledge and basic research pond, if funding is mainly allocated based on expectations of short-term usefulness and impact.[2]

There are important differences between national systems of higher education institutions to what extent these neoliberal trends of marketization, corporatism, and short-term funding are present. The UK started early and has come very far in implementing these trends (Middlehurst 2004). In the Danish setting, the neoliberal trends have started later than in, for instance, the UK, but especially during the latest five to ten years more and more corporatism and performance-based management has gained power in most Danish universities. In that sense, contemporary university management is part of the problem and not the solution for securing development of PBL and critical thinking. There is a clear need to make a U-turn—to use another populist management term. Three statements will structure the discussion:

1. Disciplinary silos in education and research need to be opened up to stimulate cross-disciplinary collaboration in order to practise PBL when solving important societal problems.
2. All three university missions—teaching, research, and external collaboration—need to be synchronized and integrated to develop a true-hearted PBL approach.

[2] The Danish-American Nobel Prize winner in physics (1975), Ben Roy Mottelson, has expressed that "if H.C. Ørsted – who discovered electromagnetism in 1820 – had lived under the regime of the current strategic research councils, he had invented an improvement of candlelight instead" (Information, January 4, 2008).

3. University governance and management structures need to be aligned with a PBL approach to allow for experiments and critical thinking.

Despite the fact that these three statements are interrelated, each is first treated separately before taking a closer look at the role of management.

Silo Thinking in Education and Research as Blocking Mechanism

Most real-world problems are complex and can seldom—if ever—be fully understood by drawing on a single scientific discipline. Take, for instance, any of the 17 UN SDGs. None of these can be accomplished without drawing on knowledge from a broad range of disciplines within science, engineering, the social sciences, and humanities. Policy makers, university directors, researchers, and funding bodies have for many years advocated collaboration across scientific disciplines and key partners in order to solve societal problems, but persistent factors block the bridge between good intentions and practice at most universities. Organizational and financial structures play a key role and so do the management and researcher's perceptions of how new scientific knowledge is generated and how to achieve a balance between specialization and interdisciplinarity. Let us start with the latter, scientific knowledge generation and interdisciplinarity.

Interdisciplinarity can be defined in a narrow or a broad way, but the terms narrow and broad are relative depending on the perspective. Narrow could, for instance, be perceived as different sub-disciplines within business economics like marketing, finance, or accounting, but it could also be seen as sub-disciplines within a sub-discipline—for instance, specializations within marketing (consumer behaviour, B2B marketing, quantitative market analysis). Similarly, interdisciplinarity in the broad sense depends on the point of departure. Combining programming, AI, and social science in a Social Data Science curriculum opens up for many new ventures but it can at the same time be regarded as a relatively narrow approach compared to, for instance, 'urban planning' or 'sustainable

development' as fields of study. In other words, we need first to agree on a problem definition in order to be able to determine how a narrow or broad scope of academic disciplines is relevant in order to analyse and solve the problem.

For years, two parallel perceptions of how interdisciplinarity and creative performance are best applied in research, learning, and problem-solving have dominated the discussion of how to organize study programmes and university departments. One view is that students first need to master a specific discipline, so that they possess what is defined as relevant specialized knowledge on a well-defined level to bring to the table as the basis for collaboration with other specialists. Another view is that too early specialization makes students scientifically narrow-minded and unable to see limitations in the theories and methods of their own discipline with less interest and capability to study problems defined outside standard curriculum later in their study or after graduation. To find the right balance in this trade-off between specialist and generalists is context dependent and has changed over time.

Most of the problem-based universities established in the 1970s started from a philosophy based on consecutive programme specialization and a relatively broad view on interdisciplinarity. As an example, when Aalborg University, Denmark, was established in 1974, several departments were established as cross-faculty departments bringing engineering together with business administration in the Department of Production; parts of engineering, humanities, and social sciences were together in the Department of Development and Planning. All students within social sciences, independent of discipline, followed the same first year study programme (a basic year) before they gradually specialized in economics, political science, sociology. The same progressive specialization structure was mirrored within engineering and humanities. However, over time this interdisciplinary organization of study programmes and departments has changed towards more specialized departments and study programmes. At Aalborg University the last cross-faculty department between humanities and social sciences was reorganized and the staff was split into existing monodisciplinary departments by August 2019. Today,

Aalborg University is mainly organized in disciplinary silos just like a traditional university; however, see note 3.[3]

Interlinked factors have urged this development towards a silo organization of research and study programmes. Clearly, a certain specialization is necessary in order to make scientific progress, and expensive research labs and equipment foster pooling of resources and knowledge in specific scientific disciplines. Without doubt, the unlimited growth of scientific knowledge is closely related to paradigmatic specialization and genuine search for understanding complex phenomena. Mutual and reinforcing development of research, new technologies and scientific methods, industrialization, economic development, social and cultural changes, urbanization, climate change have all spurred an increase of new disciplines during the twentieth century. As Scott (2017) formulates it: "disciplines are in a state of perpetual flux, subject to permanent revolution" (Scott 2017, p. 12).

Related factors with a tendency to reinforce a silo specialization approach are academic career paths based on publications in high-ranked specialized journals, university ranking systems based on disciplines, and public and private research funding systems structured on the basis of disciplines in combination with risk-averse performance allocation mechanisms. Furthermore, it may be noted that senior academics also support the disciplinary silos because these have helped to establish their reputations. We return to these elements later in the discussion of the role of management.

The silo thinking and specialization trend is further propelled by the Danish funding structure and activity-based allocation of budgets for basic research and teaching from the ministry level to the university, and from the university to the faculties before it finally trickles down to the individual department. At each of these governance levels it is in principle a policy decision (and thus a power game) about how funds are allocated to and between faculties, departments, and disciplines, but in reality, it is difficult to change the current basic budget model radically at

[3] It might seem paradoxical that during the same period many of the most recognized international universities have taken initiatives to overcome silo organization and silo thinking by establishing new cross-faculty departments and centres.

the single university level as long as quantitative performance measures drive inter-organizational competition and resource allocation. In that way, New Public Management seems to have reinforced silo organizations in the Danish university sector through hierarchical governance structures and quality control system building on hard (quantitative/economic) short-term performance measures. What is the relevance of this for PBL? Part of the answer is related to a much-needed integration of the three missions of universities: teaching, research, and external collaboration (third mission activities).

Engaged Scholarship: Synchronizing and Integrating the University Three Missions—Teaching, Research, and External Collaboration

PBL is often explained as a specific learning approach for *students*. It provides students with an active role in the acquisition and creation of knowledge—it is student-driven more than teacher-driven—and it redefines the role of the teacher in the learning process. On top of the interactive knowledge creation the PBL approach brings various additional skills that improve student' employability in the broader sense, including capability to work in teams; capability to combine theory and practice; capability to define, describe, analyse, present and solve problems; capability to reflect, receive, and give constructive critique; intercultural understanding; and project management skills. These clear benefits of PBL as a learning approach for students are all well-documented through more than 45 years of experience.

However, PBL is not only relevant for the university's first mission—learning and teaching. The second mission (research) carries PBL in its DNA. Van de Ven's concept of 'engaged scholarship' has many similarities to PBL in its ideal form applied to research:

"Engaged Scholarship is defined as a participative form of research for obtaining the different perspectives of key stakeholders (researchers, users, clients, sponsors, and practitioners) in studying complex problems. By involving others and leveraging their different kinds of knowledge, engaged scholarship can produce knowledge that is more penetrating and

insightful than when scholars or practitioners work on the problems alone" (Van de Ven 2007, p. 9). Vignette 8.1 provides two examples of how engaged scholarship can be linked to PBL in relation to student projects.

Vignette 8.1: Engaged Scholarship and PBL in Student Projects

Example 1: The Nursing Home of the Future

In 2009 Aalborg Municipality initiated a project called 'the nursing home of the future'. It should apply the newest knowledge within elderly care, architecture, design, and new technologies. Aalborg Municipality formulated different challenges for solutions and students from different disciplines—architects, sociologists, nurses, economists, accountants, planners, software engineers, and so on—worked together. Ideas and models were created, and workshops and solution camps with elderly organizations, municipality, nurses, and handicap organizations were established. Many students' ideas were implemented, and the first residents moved in primary 2014. Experiments and student groups are still involved in developing welfare technologies for elderly care applicable at nursing homes and private homes.

Example 2: Collaboration with Local Companies

At fifth semester at the bachelor programme in Business Administration all students make a semester project together with a local company. Together with the companies the students identify what problems (or challenges) they find most relevant to solve or study. For many of the small- and medium-sized companies in the region, such student projects are the first collaboration with the university—often leading to further collaboration in the form of new student projects, guest lectures, or research projects involving university staff.

Source: Gregersen (2017, pp. 376–377)

Collaboration with external partners is an integral part of a PBL approach for students and for engaged scholars in the Van de Ven sense, but from a university management perspective external collaboration is defined as a third mission, which includes all activities that fall outside the two first missions (teaching and research). Molas-Gallart et al. (2002) defined third mission activities as activities "concerned with the generation, use, application and exploitation of knowledge and other university capabilities outside academic environments. In other words, the Third Stream [Mission] is about the interaction between universities and the

rest of society" (Molas-Gallart et al. 2002 pp. iii–iv). In that way the term is rather fuzzy, and often it is difficult to make a clear distinction between the three missions. For instance, when students collaborate with and find solutions for local firms' problems, the target is both education of the students and at the same time providing solutions for non-academic communities (society). Third mission activities first became mandatory for the Danish universities in 2003. As stated in the Danish University Act (Danish University Act no. 403, May 28, 2003, section 2:3):

> The university shall collaborate with society and contribute to the development of international collaboration. The university's scientific and educational findings should contribute to the further growth, welfare and development of society. As a central knowledge-based body and cultural repository, the university shall exchange knowledge and competencies with society and encourage its employees to take part in the public debate.

Of course, universities' and other higher education institutions' direct and indirect contributions to the wider society date back longer than 2003. However, the focus, demand, and expectations from external and internal university stakeholders on universities' capability and obligations to collaborate and perform third mission activities have been escalating during the latest 10–20 years—not only in Denmark but worldwide. Several interrelated factors are driving the development. One has to do with the increasing importance of higher education and research as a precondition for competitiveness and economic growth in the knowledge economy. Universities and other HEIs have become key actors in the national innovation systems (Gregersen and Rasmussen 2011; Lundvall 2002). Another driving factor is the growing importance of the so-called 'new modes of knowledge production' or 'Mode-2 knowledge production' emphasizing that new knowledge production often requires close interaction between science, technology, and society—between theory and practice (Gibbons et al. 1994; Nowotny et al. 2001; Etzkowitz 2003). Finally, both national politicians and university management hope to see external collaboration and other third mission activities providing new

external funding opportunities supplementing resources for teaching and research.[4]

However, as the existing financial model allocates resources only for teaching and research, it has been a strategic challenge for the universities on how to prioritize the type of external collaboration that the universities should engage in. Should 'strong' partners that can pay the full costs be prioritized? What then about SMEs and other less resource-strong groups and communities?

It is important to note that there are considerable differences between universities with regard to third mission activities and how they are organized (Benneworth et al. 2016). In a comparative study of two middle-sized Danish regional universities (Aalborg University [AAU] and Southern Danish University [SDU]), Gregersen, Linde, and Rasmussen (2009) found clear differences in the way third mission activities were actually approached; see Table 8.1.

Adjustments to the overall general picture may be the case for both universities (AAU and SDU) during the last ten years, but Table 8.1 still reflects quite different regional contexts—especially in relation to industrial specialization and characteristics of firms in the two regions. But not only are the external factors important, so are the internal university factors, especially differences in scientific disciplines and prevailing teaching models. In other words, despite overall general development trends impacting on contemporary universities, there is still room for manoeuvre at the single university level. How university management at different levels administer this room for manoeuvre determines the degree to which PBL can flourish and contribute within each of the three missions. This discussion is the focus of the next section.

[4] As an example, a former liberal Danish Minister of Research (2001–2010) launched the policy doctrine for Danish universities: "From research to invoice".

Table 8.1 Illustration of third mission approaches at AAU and SDU

	AAU	SDU
External context		
Demand or supply driven	High degree of supply driven (from the university to the region)	High degree of demand driven (from large private companies to the university)
Relative importance of university R&D share in the region	High	Medium
Internal context		
The mission as part of the inherent culture, especially the prevailing teaching model	Integrated from the very beginning (1974) Part of the founding 'university culture', especially related to PBL	Relatively new focus stimulated by the integration of the Business and Engineering school
Range of mission activities	A broad palette of activities	Concentrated in a relatively small number of areas
Dominating scientific disciplines in relation to third mission	Engineering and to lesser extent business administration and communication	Mainly Engineering
Specific third mission and organizations and institutions	Gradual evolution of supportive organizations and institutions Internalization of specific organizations as part of university administration	Relatively new phenomenon Externalization of specific supportive organizations and institutions
Allocation of resources	No explicit allocation model for third mission activities	Explicit allocation model for third mission activities in specific departments

Source: Gregersen et al. (2009, p. 155)

Aligning University Governance Structures to a PBL Approach to Foster Experiment and Critical Thinking

A part of the management literature argues that management is a general profession in the sense that there are no important differences between the management of a knowledge institution like a university and a shoe factory. The few differences have mainly to do with understanding the specific terminology for different types of organizations. According to this perspective, such small differences can easily be learned after a quick introduction and a walk through the facilities. Although contemporary universities (like any organization) include standard routine tasks, universities are quite specific entities in their societal purpose/mission and organization (Bento 2011; Shattock 2002; Churchman and King 2008). PBL in all three missions comes under pressure when the layers of management forget that the real success of a university depends on highly skilled professionals able to take responsibility for their own work, and instead imposes hierarchical top-down management in a silo-dominated structure.

That private universities have become big business and have introduced management principles borrowed from large private corporations may not come as a surprise. However, recently public funded universities all over the world have jumped on the same train. The flag of worries has been raised by several scholars that these forms of New Public Management (NPM) might be contra-productive to the main role of universities. Nonetheless, only peers seem to share the concern, and the NPM train continues at even higher speed in many public universities while at the same time similar management principles are becoming obsolete in most private sectors.

One very visual effect of the NPM governance structure in Danish universities is the increased focus on more and more quantitative performance criteria, for instance, students' efficiency measured as number of students that graduate without delay, number of publications in high-ranked journals, number of external collaborations, number of PhDs, number of Nobel Prize winners, amount of external funding, numbers of

centres of excellence, and many more. It seems that all that can be counted is counted and benchmarked regardless of relevance. It also means that more administrative resources are allocated to control and report to an increasing number of management layers with no or little knowledge and experience of teaching, research, and external collaboration. Paradoxically, NPM often goes together with so-called soft HR management principles colonized with concepts such as team-based organizations and value-based management and leadership. Introducing these 'hard and soft' management principles in Danish universities has not only increased the administrative costs and bureaucracy relative to and at the expense of resources for teaching and research. It has also extended the cognitive and power distance from the single teacher and researcher 'on the ground' to the management at the top. If this continues, there is a risk that a top-down-driven hierarchy will destroy collective commitment and responsibility at the bottom. John Child (2019) in his latest book on hierarchy convincingly raises this concern in relation to hierarchy as a governance principle providing examples from various types of organizations.

Independent of the level of governance, management often finds itself in a cross-pressure situation. The Dean may experience pressure on the one side from the Director of the University to keep the allocated budget at the Faculty level and on the other side pressure from the Heads of Departments to allocate more resources to their departments to secure quality teaching and research. At the department level the cross-pressure is similar. The Head of Department has to keep expenditures within the allocated budget and deliver the required performance outcomes to the Dean and on the other side manage the demand for more resources and better work-life balance from administrative and academic staff, students, and other interest groups. However, despite NPM and the general pressure on HEIs, there is still (some) room for manoeuvre for management and staff at the department level on how teaching, research, and external collaboration are organized, if the will and interest are present.

The room for manoeuvre for management (and staff) at the department level concerns both the institutional setting supporting PBL as a learning approach and the content and focus of curricula and research activities. First, we emphasize specific management issues related to maintaining and nurturing a PBL approach. An essential—but not

always easy—prerequisite is that PBL has to be an integrated part of the strategy and resource allocation at all levels from teaching committees, research groups, and management. To have PBL as an integrated part of the curriculum requires (i) PBL qualifications for all teaching staff, (ii) external collaboration and legitimization, (iii) allocation of resources and facilities, and not least, (iv) management understanding of their management task.

PBL Qualifications for All Teaching Staff

With mass education increasingly focusing on teaching qualifications, pedagogy courses are normal requirements for university teachers. As mentioned earlier, PBL redefines the role of the teacher in the learning process. To let the acquisition and creation of knowledge be more student- than teacher-driven may be difficult to accept and handle, especially for teachers or supervisors educated in a more traditional university setting with a fixed and detailed curriculum conveyed in the lecture hall. Several management-related aspects influence how PBL is implemented and developed over time:

- *Commitment from research and teaching groups to apply and develop PBL in teaching and supervision*. If we look at the 45 years of PBL experience at Aalborg University, it is clear that there are differences in the way PBL is implemented in different study programmes and faculties. Concurrently with the growing silo organization along disciplines, allocated time for students (measured in European Credit Transfer System (ECTS)) and staff (measured in supervision hours) to PBL in the form of project-organized group work has come under pressure to squeeze more organized course work and individual exams into the curriculum. Of course, PBL can be implemented in course work, but in practice it often appears as exercises within a finite sample space. Adopting the 'engaged scholarship' approach at the research and teaching group level may be one way to safeguard PBL.

- *PBL as an explicit requirement in staff recruitment.* Although teaching and supervision play a dominant role for most university professors, it is often the research merits measured in number of papers and citations in high-ranked journals that determine the academic career path. Giving more weight to teaching experience and explicitly underlining PBL qualifications in job announcement are obvious procedures that management can use.
- *Introduction to PBL in context for new staff.* Unfortunately, it is not unusual that a new member of staff is expected to just blend in and take on supervision responsibilities from the first working day. Learning by doing might be an OK approach in some circumstances, but not at least in the case of young staff; it would benefit the students and the staff member if an introduction to PBL in the specific context is institutionalized.
- *Life-long learning in PBL approaches for teaching staff.* That PBL is an integrated element in compulsory pedagogical training for assistant professors at PBL universities is clear. However, ideally, pedagogical training, learning, and renewal of pedagogical qualifications in the digital age should be high on the agenda for teaching staff at all levels. To realize that requires allocation of time and resources.

Collaboration, Recognition, and Support from External Partners and Employers

When Aalborg University was established as a new PBL university, scepticism among established universities and employers was high towards the teaching and learning approach based on project-organized group work and group exams. It took several years—and admittedly some adjustments—before graduates from Aalborg University were recognized in the same way as graduates from the old and well-established Danish universities. Support from regional stakeholders and not least local firms' and public and private organizations' willingness to engage with students by providing internships, case material, and project ideas for all kinds of study programmes has been vital for surviving and further development of the PBL approach during the 45 years of the university.

Allocation of Resources and Facilities

From a management perspective, PBL in education and research requires specific types of resources and facilities to support students, supervisors, researchers, and external collaboration partners.

- *Allocation of resources for experiments with new ideas and different approaches*. When students and researchers start the research journey, the end result is not known. Students may start with an idea and find that what they first defined as a problem turned out not to be a real or relevant problem. Or they may realize that they did not manage to solve the problem within the given timeframe. This risk may make students (and their supervisors) insecure, and if there is no room for experiments, students and their supervisors may limit their problem formulation, methods, and analysis to take a more secure and confident road. Competition for high marks and jobs, pressure to finish 'in time' may push students in that direction. The same risk applies to researchers due to the prevailing 'publish or perish' doctrine and the current external funding system, where more and more funding is allocated to established researchers that can document that they have a long track record in the relevant topic. There are good reasons for not wasting tax-payers' money, but the long-term risk is that the stream of genuine new knowledge and solutions to societal challenges dries up if the source spring of basic research dries out. Management at all levels of the university has a responsibility to restrain the populist trend that research should be able to demonstrate impact and relevance for the industry or other external stakeholders even if it is only short term. A PBL approach with room for experiments can be a way to balance the various interests. In the study programmes, it can be (or should be) done by making sure that each curriculum contains enough freedom for students to go beyond their main discipline. Learning outcomes and assessment criteria might need to be revised to stimulate creativity and students' courage to follow new roads.
- *Physical facilities and IT infrastructure (group rooms, meeting places, IT)* does not need many comments, just that despite Google docs, emails,

Skype, and online libraries student groups still meet on campus to coordinate and discuss their project work and hence there must be an appropriate, adequate, attractive, and networked space for them.

- *Dedicated and integrated administrative support*. Above the focus has been on teaching, research, and third mission activities, but from a management perspective it is important to have integrated and accessible administrative support functions for students and teachers/supervisors. This applies not least to student projects carried out in collaboration with external partners. These types of collaboration require persistent coordination and effective communication before, during, and after each project semester to maintain, develop, and expand collaboration year after year. Aalborg University's central 'third mission' department once estimated that every semester around 2000 student projects are carried out in collaboration with companies and other external partners.

Management Understanding of Their Management Task

Using the terminology of Mintzberg (1993), a university can be expected to possess many characteristics in common with a professional bureaucracy in the sense that key actors (university staff) have wide-ranging decision powers and the freedom to organize their work (be it teaching, research, external collaboration, administration). It implies that key decisions are decentralized to the operative core consisting of highly educated specialists with the highest level of knowledge and competences available. Due to the extreme specialization of staff according to academic disciplines, the structure is characterized as horizontally complex. If, on the other hand, hierarchical management structures originally designed for a simple machine bureaucracy are implemented in such a horizontally complex organization, you will expect that a clash of civilizations is approaching. However, such a clash has not materialized—at least not in the Danish context. Critique has been raised, but mainly internally among academics in academic journals. Using a combination of sticks and carrots, it seems as though the current governance structure

characterized by hierarchy and centralization of decisions will survive several years ahead.

As in all hierarchies with rigid top-down decisions there is a risk that engaged scholars become less engaged and leave initiatives and responsibility to the formal management. On the other hand, if the various layers of university management decide to scale down the NPM tendencies, it could give better room for PBL approaches based on critical thinking and experimentation.

However, it seems to be difficult to break out of the NPM doctrine and hierarchical organizational forms once they have been introduced. The drawbacks of not 'breaking out' have direct consequences for curricula and research. One way this is reflected is by mainstreaming existing study programmes, so students' influence on the focus and methods used in their semester projects are limited by curricula. Another consequence is budget allocation at the single programme level, so that study programmes with few students are closed and only programmes that are 'profitable' (in the narrow sense) are maintained. As more and more restrictions are implemented directly in curricula or indirectly by lack of resource allocation, it becomes more difficult for students and researchers to organize and participate in cross-disciplinary activities. One promising exception from this trend is that most universities have started initiatives to deal with the 17 UN SDGs. With reference to the SDGs most universities now organize activities within all three missions.[5] Some of these SDG-related activities may turn out to be 'green-washing' or 'window-dressing', but many activities do have a potential to be more than that. Whether it will generate a 'new 1968 student revolt', it is far too early to say.

[5] An example from Aalborg University is problem-solving organized around 'mega-projects', where students from all disciplines are offered a possibility to work together in cross-disciplinary groups with various SDG-related projects. An example of one of these mega-projects runs under the heading 'the circular region'; another is about 'sustainable living'.

Conclusion

Three interrelated statements have been put forward in an attempt to discuss how PBL implementation and development can be stimulated in contemporary universities:

- Disciplinary silos in teaching and research need to be opened up to stimulate cross-disciplinary collaboration in order to practise PBL for solving important societal problems.
- All three university missions—teaching, research, and external collaboration—need to be synchronized and integrated in order to develop a true-hearted PBL approach.
- University governance structures need to be aligned with a PBL approach in order to allow for experiments and critical thinking.

These are important tasks, if PBL and engaged scholarship are to flourish. The first step is to reassess the hierarchical structure that currently characterizes university management. This could give room for reintroducing self-governance and collegiality.

As has been indicated above, even in the current management regime there is room for manoeuvre, but management and staff seem unaware or reluctant to exploit these options to stimulate PBL and critical thinking. Comparative studies at the department level of how decision-making on curricula development takes place, how research priorities are made, how university-industry collaboration is organized, and not least how PBL is implemented and modified across disciplines could provide interesting insights for guiding management and policy makers in order to stimulate PBL and engaged scholarship.

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