Why don't we all just do the same? Understanding variation in PBL implementation from the perspective of Translation Theory

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ABSTRACT

Variations in PBL implementation need to be seen as the norm rather than the exception, since local PBL practice will always diverge from the "original model". In order to understand this phenomenon, this conceptional paper first systematizes variations in PBL implementation at the inter-institutional, intra-institutional, and individual level. Then, variation in PBL implementation is discussed through the lens of translation theory as part of the research tradition of Scandinavian Intuitionalism. Resulting insights are applied to develop guiding questions designed to help leaders and PBL researchers to reflect on PBL implementation processes. Uncharted territories in PBL implementation research are identified, and it is argued that researching PBL implementation can serve as a blueprint to understand educational change dynamics in institutions of higher education.

Keywords: problem-based learning, variation, implementation, translation theory, Scandinavian Institutionalism, educational change

Introduction

Problem-based learning (PBL) conceptualizes learning as an active, social, embedded, and scaffolded process, in which the identification of knowledge gaps and lack in understanding leads to the integration of new knowledge in existing cognitive structures (Capon & Kuhn, 2004; Hmelo-Silver, 2004) and promotes conceptual change (Loyens et al., 2015). These claims are substantiated by a broad variety of accounts about the implementation of PBL in academic disciplines and contexts as diverse as medical education (e.g., Fyrenius, Silén, & Wirell, 2007), psychology (e.g., de Koning, Loyens, Rikers, Smeets, & van der Molen, 2012), teacher training (e.g., Hemker, Prescher, & Narciss, 2017), law (e.g., Kiiver, 2012; Wijnen, Loyens, Smeets, Kroeze, & Van der Molen, 2017), physics (e.g., Hemmerich, Stark, Pape, & Scholkmann, 2016; Pease & Kuhn, 2011), engineering education (e.g., Abrandt Dahlgren, 2003; Guerra, 2017), and interdisciplinary courses (e.g., Brassler & Dettmers, 2016), amongst others.

However, as the observation of practices around the world shows, the PBL idea has been interpreted and enacted in many different forms, often as blend between some shade of the "original" PBL model and other instructional elements. For many, this "original" model is the PBL practice established at McMaster University, Canada, in the 1970s and 1980s as a new approach to medical education (e.g., Barrows & Tamblyn, 1980). Indeed, there is no doubt that the educators and researchers at McMaster were the pioneers in developing and systematizing the use of signifying features of the PBL approach—such as the authentic problem as the starting point of learning or the self-directedness of the learning process—into a coherent instructional model. However, as Barrows (1996) mentions, even in the early days at McMaster, PBL practices started to vary across the different academic fields. Also, while the originality of the PBL model (as the combination of its distinctive features) is not in doubt, a couple of other instructional approaches became fashionable during the same time period in which

the McMaster PBL was conceived, and these approaches share overlap with some of the PBL features; examples include the German version of research-integrated teaching ("Forschendes Lernen," e.g., Huber et al., 2009), forms of case-based learning (Katsikitis et al., 2002), or project studies (for an overview, see Thomas, 2000).

Today, looking at current PBL practices around the globe, we can see that the "original" model has been adapted across all academic disciplines and in multiple forms (e.g., Savery, 2006). These variations in PBL implementation have, on the one hand, triggered a lively scientific debate on which of them might be the most efficient, effective, or suited for learning in different contexts (e.g., Lloyd-Jones et al., 1998; Schmidt et al., 1994; Schuwirth et al., 1999; Srinivasan et al., 2007) and what specific elements of the PBL setup should look like to be most effective (Barrows, 1986; Walker, Leary, & Lefler, 2015). On the other hand, as I have been able to observe in my practice as an educational developer, the presence of a multitude of PBL "hybridizations" (Hendry et al., 2017, p. 1) has held the potential to create confusion amongst teachers, researchers, and higher education leaders implementing PBL over what "true" PBL might be, and how variation in PBL implementation should be interpreted in relation to the "original" model.

So, while academic discussions about effectiveness and efficacy of various PBL implementations are valid and should be pursued with scientific rigor, in the present paper I will approach the phenomenon of variation in PBL implementation from a different angle, which is to understand why these variations occur in the first place, and how they can be treated as a resource rather than a problem. I will argue that each PBL variation needs to be seen as an inevitable and thus resourceful further development of the PBL idea under specific temporal, local, cultural, and individual circumstances. For that, I will build a theoretical argument based on one specific theoretical approach, which is translation theory (e.g., Czarniawska-Joerges & Sevón, 1996) as part of the research tradition of Scandinavian Institutionalism (e.g., Boxenbaum & Pedersen, 2009).

Translation theory, which to my knowledge has not been used to explain variation in PBL implementation before, is a powerful lens through which to interpret variations in enacted practices when implementing theoretical and abstract concepts, since it assumes that these abstract concepts (such as the defining elements of the PBL approach, for this article) undergo unique interpretations and translations when being implemented in a local context. Translation theory has been mainly used to explain the diffusion of managerial concepts such as new public management and new public governance (Boxenbaum & Pedersen, 2009). However, at least two studies do exist which applied translation theory to

the phenomenon of educational change in business education. One of them explores the migration of the managerial concept of rankings into the field (Wedlin, 2006); the other provides a narrative about the establishment of the London School of Economics as the result of dynamics between new ideas about the nature of economy and a group of influential stakeholders who promoted them (Czarniawska, 2009).

Whilst the present paper is not, like these writings, intended as a study about the migration of the PBL idea into various or one specific institutions of higher education, it does aim to provide an argument for the use of translation theory as a template to understand variations in PBL implementation. For that, I will underpin my arguments with elaborations and examples on implementations from the PBL literature, and here specifically from two resources, namely the recent Wiley Handbook of Problem-Based Learning (Moallem et al., 2019) and the Essential Readings in Problem-Based Learning (Walker, Leary, & Hmelo-Silver, 2015). However, other conceptual and empirical writings will be used as supplementary material, such as the "voices from the field" section of this journal, together with my own experience gathered over many years as a PBL expert, practitioner, and educational developer involved in PBL implementations (especially in the German and wider European context).

With higher education being the central institution that prepares students to become competent in answering the burning challenges of a complex and fragile world, PBL in all its variety might provide a valuable solution (cf. also Thomassen & Steentoft, in this issue). Hence, the uptake of some form of problem-based instructional approach is of vital interest for many institutions of higher education, as well as for individual teachers. So, besides addressing a scholarly interest in using a management-related theory such as translation theory to interpret educational change towards PBL, this paper also aims to provide inspiration and guidance for higher education leaders and PBL practitioners alike to better understand the phenomenon of the PBL idea transforming and evolving throughout its implementation, and how this can be used as a resource when implementing PBL at an institution of higher education.

Variations of PBL implementation – an overview

As mentioned before, the original PBL was developed during the 1960s and 1970s at McMaster University, Canada; early adoptions could be seen by some institutions, including the most prominent examples of Maastricht University, Netherlands, and Aalborg University, Denmark (de Graaff &

Kolmos, 2006; Servant-Miklos et al., 2019). These early (and prominent) adoptions of the PBL idea preceded more recent institution-wide implementations of PBL in institutions and schools of higher education and K-12 education alike (e.g., Hendry et al., 2017; Wijnen et al., 2017).

Both the early, prominent as well as the later institution-wide PBL implementations demonstrate a broad variety of inter-organizational variation regarding the PBL idea and principles. The Maastricht model, which has been described as a refinement based on the original McMaster template (Servant-Miklos et al., 2019), steers the PBL process rather closely, with pre-defined cases, a short-time sequence of case work (several cases per semester), close tutorial group supervision, and the distinguished "seven steps" or "seven jumps" method to scaffold the process (Wijnia et al., 2019). Aalborg, on the contrary, runs a model in which students work on self-selected problems in semester-long projects, which challenges them to attain a high level of self-organization due to a more loosely scaffolded process (Kolmos et al., 2019). Newer institution-wide PBL variations have, for example, experimented with short-timing of the Maastricht model to the "One Day-One Problem" approach (O'Grady et al., 2012) or with implementing a "Flipped PBL" model in an Australian high school (Hendry et al., 2017).

The causes for inter-institutional variation on the PBL approach can be manifold. However, the PBL literature has been discussing a few, such as for example cultural-educational influences, which can affect the degree of readiness to engage in and with self-directed constructivist pedagogy, both on the institution's and on the learners' side (cf. Frambach et al., 2012; Jippes & Majoor, 2008). Also, from the analysis of Servant-Miklos et al. (2019), it becomes clear that external political, strategic, and ideological factors certainly played an important role in the variation created at both Maastricht and Aalborg University on the institutional level.

The inter-organizational differences of PBL are only one side of the coin. They are complemented by intra-organizational variations, which emerge across programs, faculties, or even amongst individual groups of teachers. These variations have been attributed to epistemological underpinnings of different academic fields (Savin-Baden, 2000), and to resulting learning and assessment goals and practices for various disciplines (Walker, Leary, & Lefler, 2015). And these claims are in fact clearly supported by empirical evidence (e.g., Abrandt Dahlgren, 2003; Abrandt Dahlgren & Dahlgren, 2002).

What stands out when looking at inter-institutional variations, though, is that often not the core elements of PBL (such as a cased-based vs. a project-based approach) varied across disciplines, but more the interpretation of these core elements. This means that while an institution might follow a more or less coherent idea about what "their" PBL should look like, what tends to cause variation is the adaption of these elements to suit the paradigm of the respective discipline or program. However, an alternative explanation for inter-organizational variations in PBL implementation has been provided by those who argued that the intra-institutional variations observed throughout Maastricht University indicated a lack or loss of understanding of the pedagogical principles underlying PBL (Dolmans et al., 2005), such as the idea of self-study, learning in a relevant context, and the integration of new knowledge into one's own existing knowledge base (Hmelo-Silver, 2004). With that, at least two somewhat competing accounts of variation in PBL implementation at the intra-organizational level exist, the first one treating the phenomenon more positively, as an expression of differences in academic epistemologies, the second being more critical, treating it as a derailment and potential flaw.

A third perspective on variations of PBL implementation comes from a different angle, where individual teachers have designed and taught in initiatives implementing PBL in a single course or module on various occasions, thus creating PBL variations, which iterated the PBL idea widely under specific local and cultural conditions. These individual variations normally emerged without an official institutional PBL strategy and were influenced by colleagues and individual or small-group interest and belief in the PBL idea as a tool for educational change. Examples here are the integration of PBL problems in a writing course to foster critical thinking (Kumar & Refaei, 2017), the use of multimedia material to foster historical and social study inquiry (Brush & Saye, 2014; Saye & Brush, 2002), or my own iterations merging "classical" PBL casework into traditional lecture series (e.g., Scholkmann, 2017; Scholkmann & Küng, 2016), to mention only a few. Interestingly, many reported that individual PBL variations, including some very innovative and far-stretching ones, are of an interdisciplinary nature and attempt to bring together competences from varying academic fields (e.g., Braßler, 2016; Doubleday et al., 2015; Warr & West, 2020).

As experiences such as my own have shown, individual-level PBL variations often occur when the PBL idea is submitted to the expectations toward teaching under a non-PBL institutional policy, leading to highly hybridized forms of PBL practice. This may mean that the way they appear will likely be influenced by curricular demands, such as assessment practices (Norman et al., 2008) or specific pedagogical or institutional requirements (O'Grady, Yew, Goh, & Schmidt, 2012; Scholkmann, 2018). With that, individual variations often do not fulfill the demand for a "completely integrated PBL" (Saarinen-Rahiika & Binkley, 1998, p. 195) curriculum.

And while this stands contrary to Savery's (2019) claim that "PBL must be the pedagogical base in the curriculum and not part of a didactic curriculum" (p. 85) in order to signify as such, I want to argue that they add to the full picture of PBL implementations since they often provide highly innovative and forward-oriented developments of the PBL idea.

Besides the systematization of PBL variations into the inter- and intra-organizational and individual dimension as proposed here, variations in PBL implementation are also discussed regarding the integration of online and blended PBL solutions (e.g., Ravitz & Blazevski, 2014), which, as Savin-Baden & Bhakta (2019) point out, can be extremely "broad and varied" (p. 645). Also, Ertmer & Glazewski (2019) have noted that the approach to and practice of scaffolding in PBL can vary widely, presumably on a continuum between a "hard," i.e., learning-goal-oriented, and a "softer," i.e., open-ended process-oriented pole; this variation can be observed both across disciplines/programs and different education levels, from K-12 to higher education.

An overview of the proposed systematization of PBL implementations together with examples, dimensions of, and (alleged) causes for variations discussed in the PBL literature can be found in Table 1.

Understanding variation in PBL implementation through the lens of translation theory

Within translation theory, "translation" is understood not in a linguistic sense, but as a metaphor to describe the transformative processes that concepts and ideas undergo when they travel from one institution to another (Waeraas & Nielsen, 2016). Therefore, this theory describes the prerequisites and processes by which an idea transfers across time, space, and institutional environments. Its roots can be found in the works of, amongst others, French sociologist Bruno Latour (Latour, 2003; Latour, 1984). In its current applications, translation theory is closely connected to the research tradition of Scandinavian New Institutionalism, a sociological school that studies organizations through the lens of social-constructionist and systemic perspectives (Boxenbaum & Pedersen, 2009; Czarniawska, 2008). Within this research strand the theory is primarily used to study the implementation of management ideas in public institutions. However, as will be argued below, it can be used to provide a fruitful dispositive basis to understand also the enactment of educational change, as witnessed in variations of PBL implementation.

Adoption of the PBL idea—but why and how?

That PBL is a concept that was and is being adopted in educational environments stands without doubt. But why do certain institutions, educational teams, or even individual teachers adopt the concept, while others do not? What makes those institutions and actors more "adoption-ready" and the PBL idea "adoptable" in the first place?

An overall argument of translation theory is that the diffusion and adoption of an idea is not a rational decision, but happens based on a complex interplay of motives, interest, and socially constructed interdependencies. Two general processes are those of imitation—one institution imitating a practice observed in other institutions—and identification—the fact that "one imitates those one relates to and those with whom one identifies" (Sahlin & Wedlin, 2008, p. 222). It has also been stressed that institutions and individuals will adopt an idea because this idea will distinguish them from other institutions, but at the same time make them more similar to those they deem relevant (Czarniawska-Joerges & Sevón, 1996).

According to translation theory, the imitation of ideas can be described by the metaphors of "fashion" (Czarniawska, 1996) or—most significantly at the time of writing—"virus" (Røvik, 2011). While the fashion metaphor helps to interpret the observation that certain concepts and ideas have clearly come in waves (and sometimes perished afterwards), the virus metaphor points to the fact that an idea can remain dormant before being subsequently re-activated. Both metaphors stress the fact that ideas do not diffuse mechanically from one place to another, but undergo active transformative or translational processes in migrating from one context to another (Sahlin & Wedlin, 2008).

With respect to the understanding of PBL implementations, both of these metaphors can be useful: PBL has seen times when it was more fashionable—for example in the global tumult of the 1960-70s (Servant-Miklos et al., 2019) or in the wake of implementing the Bologna process and the resulting educational changes in Europe. However, just like in the virus metaphor, it has also re-emerged several times once conditions (for example, funding lines, educational change agendas, or external pressures) were favorable. An example here is the massive funding initiative "Quality Pact for Teaching" (org. Qualitätspakt Lehre[1]) by the German government, which in its first period between 2012-2016 alone had funded 11 institutions with projects that qualified as "problem-oriented" (Scholkmann, 2016).

However, an idea does not simply find its way as a fashion or as a virus because it is the most powerful or convincing compared to others (although some of us as PBL experts

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[1] https://www.qualitaetspakt-lehre.de

PBL variations		
Inter-organizational	*Intra-organizational*	*Individual*

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Examples	Maastricht PBL vs. Aalborg Project Studies "One-day-One-Problem" approach "Flipped PBL" approaches	Different interpretations of PBL principles in various academic disciplines Variations in self-study time, PBL steps, supervision of the tutorial group, handling of references, tutor preparation and lecture-tutorial ratio	Merging of PBL casework into a lecture series Use of PBL cases to foster specific competences (e.g. writing/ argumentative skills, critical thinking) Presentation of cases in multimedia-form
Differences (variations)	Use of pre-defined cases vs. student self-selected casework Presentation of learning materials through lectures vs. in a flipped format Intensity of the casework	Focus on problem-solving vs. problem-exploration Less vs. more self-study time Shortened vs. prolonged brainstorm and problem-discussion phases Tutors who supervise only one/ more than one group(s) Student tutors vs. staff tutors Pre-defined references vs. open literature search Content-wise vs. pedagogical tutor preparation Increased number of lectures	Highly divers and locally adapted Often "under the radar" within a non-PBL curriculum Often interdisciplinary and innovative/future-oriented
(Alleged) causes	Cultural/national differences in conceptions of learning and education Political, strategic and or ideological influences	Epistemological underpinnings of different academic fields/ disciplines Lack/loss of understanding of the PBL pedagogical principles	Individual curiosity, conviction and passion for the PBL idea Use of "windows of opportunity", e.g. through innovation funding initiatives
Other dimensions of variations	Degree and type of technology integration and/or online/blended PBL Type of scaffolding		

Based on Abrandt Dahlgren, 2003; Abrandt Dahlgren & Dahlgren, 2002; Braßler, 2016; Brush & Saye, 2014; Doubleday et al., 2015; Ertmer & Glazewski, 2019; Frambach et al., 2012; Hendry et al., 2017; Jippes & Majoor, 2008; Kumar & Refaei, 2017; Moust et al., 2005; Müller & Henning, 2017; O'Grady et al., 2012; Savin-Baden, 2000; Savin-Baden & Bhakta, 2019; Saye & Brush, 2002; Scholkmann, 2017; Scholkmann & Küng, 2016; Servant-Miklos et al., 2019; Walker, Leary, & Lefler, 2015; Warr & West, 2020; Wijnia et al. 2019.

Table 1: Variations in PBL implementation, overview

might surely feel that this is so). Translation theory argues that a concept transfers and travels on the pathways of social relations and networks, and that it only becomes powerful as a result of the intensity and steadiness of those circulations (Sahlin & Wedlin, 2008). This notion can be traced back to Scandinavian Institutionalist theory in a broader sense, where a central assumption is that development and change do not take place based on rational decision-making, but through contingent processes which lead to the emergence of new solutions that will eventually be rationalized retrospectively (e.g., Cohen et al., 1972).

Applied to examples of PBL implementation, it can be argued that both the institution-wide implementations of the 1970s and 1980s and the smaller local variations were or are transported through social, often personal, channels. In Servant-Miklos et al.'s (2019) account of how Maastricht University adopted PBL from McMaster University, these social channels are clearly visible. The same mechanisms can be assumed to hold true, more from an anecdotical perspective, for small-scale individual PBL implementations, where collegial exchange or an encounter with an engaged educational developer has often led to adoption of this concept because it was deemed an appropriate solution (e.g., Hendry et al., 2017; Hemmerich et al., 2016).

In order to transfer an idea or concept throughout an institution, this idea or concept needs to be adopted by the individuals within this environment. Earlier works of Scandinavian Institutionalism assumed that concepts, especially when imposed from a top-down perspective, will lead to only "ceremonial adoption" (Meyer & Rowan, 1977), with no actual impact on practice or identities. According to translation theory, concepts and ideas are shown to be truly adopted once actors can relate them to their experiences and identities. This has been discussed under the term "appropriateness" (Sahlin & Wedlin, 2008, p. 221), which means that individuals as carriers of adoption will assess respective concepts in light of their practices, experiences, and identities—and adopt them only to the extent that it makes sense for them under local and personal circumstances. This resonates with accounts of PBL implementation where the active (and sometimes controversial) adoption of the PBL idea by faculty and teachers is discussed as one of the crucial points (e.g., Spronken-Smith & Harland, 2009; Wijnen et al., 2017). Additionally, a joint sense of necessity and urgency has been identified as a prerequisite for successful PBL implementation (e.g., Kolmos, 2010), and can eventually be transferred to issues of educational change in a broader sense as well (e.g., Goodyear & Casey, 2015).

Transferring an idea—but not the enacted practice

Given that the PBL idea transfers by way of socially negotiated processes, the question remains as to what it is that "travels" from one institution to another. Translation theory is very clear in arguing that what is transferred is not the concrete idea enacted in local practice, but the materialization of this idea or practice in various types of artifact (Sahlin & Wedlin, 2008). In order to travel, ideas have to be de-contextualized and de-coupled from the actual local practice and condensed in tangible artifacts, which can overcome space-time distance and materialize in new places. However, the ideas transferred by means of these artifacts inevitably will change in this new environment, because their contextualized interpretation in the new setting will be different from what they were in their original time and space (Czarniawska & Joerges, 1996).

I am arguing that we can see two different types of artifacts that are carriers of the PBL idea: The first type are the general how-to guides and templates of the different PBL models. These are communicated through textbooks and in the form of knowledge-transferring talks and workshops (for examples cf. Holgaard et al., 2014; Kolmos et al., 2008; Loyens et al., 2012; Moust et al., 1999; Weber, 2007, to mention only a few). Such guides and communication thereof provide the condensed essence of the respective local PBL practice; they de-contextualize the PBL practice, though, because they synthesize common points of this practice and bring it into a generic form. By doing so, they omit information about intra-institutional and individual variations. They should therefore not be confused with accounts about such variations, which should be treated as the result of (successful) re-contextualization of the generic templates (Sahlin & Wedlin, 2008). Here, the examples discussed above clearly show that once generic PBL principles get adapted to specific contexts, their re-conceptualization can take a broad variety of forms, some of which will resemble the template (for example the Maastricht or the Aalborg PBL model described above), whilst others will diverge from it, sometimes broadly and creatively.

What might help to further understand the function artifacts as carriers of the PBL-idea is a distinction made by translation theory between prototypes and templates (Sahlin & Wedlin, 2008, p. 228f). Both of them are de-contextualized artifacts. However, while prototypes are generic models (such as the Maastricht PBL or the Aalborg PBL model), templates will come in the form of general principles or "checklists" (Sahlin & Wedlin, 2008, p. 228f), which systematize general rules or the most important points. For PBL, a template could be one of the several variations of the formulation of PBL principles, such as the work on authentic cases,

the self-directed learning process, the tutorial guidance, etc. (e.g., Hung et al., 2019; Kolomos et al., 2004; Wijnia et al., 2019). Although empirical evidence is not overflowing on this topic, it seems that templates allow for a more contextualized adoption and shape a common identity among adopting institutions (Wedlin, 2006). Also, PBL templates might be more helpful to discern a well-developed PBL implementation from a "poor" one (Dolmans et al., 2005, p. 732), in the sense that both can be checked against the template containing a set of PBL principles on whether these principles are fulfilled.

A second category of artifacts that serve to spread the PBL idea can be seen in the programmatic underpinnings of PBL as an educational concept. These underpinnings, which have served as a rationale for PBL implementations all over the world and are communicated in academic writings and teachings, condense the broad and diverse pedagogical and psychological theories upon which PBL has been built. In the recent Wiley Handbook for Problem-Based Learning, they are divided into two big traditions, the cognitive constructivist foundations (Schmidt et al., 2019) and social foundations (Hung et al., 2019) of PBL. The former roots PBL in a cognitive constructivist theoretical model, framing it as a method to broaden knowledge structures through inquisitive scaffolded and connected learning practices (Hmelo-Silver, 2004; Schmidt et al., 2009); the latter takes a social-constructivist stance and argues for a broader understanding of the PBL learning process as a socially embedded practice that incorporates students' real-world experience and prepares them for professional action in a complex world.

What stands out when looking at these two research strands is that some of their most prominent writings were produced well before PBL found its initial form at McMaster University. Thus, it can be argued that the very PBL idea itself could already be the re-contextualized interpretation of much broader educational and psychological concepts. In the light of translation theory, this is a valid assumption, given that each idea has to have predecessors (Sahlin & Wedlin, 2008, p. 226 et seq.). However, given that PBL has at least two different (and sometimes competing) theoretical underpinnings, current variation in PBL implementation could also be read not as a translation of "the one" original model, but as re-contextualized hybrid or "conglomerate of interventions" (Schmidt et al., 2019, p. 25) based on different ideas brought together, including valid but not fully compatible educational ideas such as research-integrated or project-based learning (cf. the introduction to this paper).

Translation processes—finding local interpretations through editing

Based on the above-mentioned assumptions of translation theory—that an idea like PBL will be adopted based on social and contextual factors and that the carriers that allow the idea to travel are de-contextualized, generic artifacts—we can now look at what this means for PBL implementation, and how we can understand variation in PBL implementation based on this.

As has been stated in the introductory paragraphs, it is obvious that PBL implementation creates broad variety, both inter- and intra-organizationally as well as on the level of individual, small-scale PBL projects. This resonates clearly with translation theory, where it has been stated that "several studies indicate that local translation regularly leads to the emergence of new versions and significant variation in structures, routines and practices" (Røvik, 2016, p. 292). The process of finding local, contextualized adaptions for an idea through enacted practices in translation theory sometimes is labeled as "editing" (Sahlin & Wedlin, 2008, p. 223). It describes how, when imitating an idea, this idea undergoes changes and transformations in an active and performative process.

From the above citations it already becomes clear that what creates this variation is the enacted practice rather than the abstract idea (Czarniawska & Joerges, 1996). According to translation theory, enacted practices are shaped by all kinds of contextual influences. For PBL implementation we can isolate a few here, based on the current literature and observations in the field, as discussed above (cf. section 2). Under these influences, variations of PBL implementation have produced a fair amount of highly creative and innovative solutions over the years. However, as translation theory stresses, local variations of an idea will also be restricted by rules of social conformity and control, thus limiting the expectation of total open-endedness for innovative processes. These "editing-rules" "restrict and direct the translation—or editing—in each phase of circulation" (Sahlin & Wedlin, 2008, p. 224). Consequently, they do not need to be explicitly stated nor guided by clear and obvious agendas; often, they will be developed or co-constructed in the course of implementing the idea, and will depend on the specific contextual factors; however, they can be reconstructed retrospectively—and used as a means to learn about those contextual factors.

Practical implications of translation theory for PBL implementation

On the basis of the insights translation theory has to offer to understand variation in PBL implementation, it is tempting to ask whether and how this theory can also provide useful advice for PBL implementation on a pragmatic level. Authors before me have elaborated the question of successful PBL implementation through the lens of educational change management—both with a perspective on structures and on processes. For example, Müller (2011) has systematized "institutional requirements and conditions" for that; Chen et al. (2020) and Kolmos et al. (2016) have identified different levels of PBL implementation, and Kolmos and de Graaff (2006), much in line with the assumptions of translation theory, argue that we must understand the implementation of PBL as a process contingent to local and contextual factors.

As we can see from those examples, the context-specificity of the PBL idea is already present in conceptions of successful PBL implementation. However, many of the current models (for PBL, but also for educational change in general, e.g., Kezar, 2013), do no more than mention these generically, and do not specify them for a unique implementation process. Here, translation theory and the elaborations above can help us to go one step further. As a first attempt to do so, I am traversing the assumptions above in the context of open-ended questions. In doing so, I aim to create a reflective narrative of the PBL implementation process on the inter-institutional, intra-institutional, and individual level, which can and should be used by both researchers and higher education leaders to reflect upon their observations and experiences when implementing PBL or researching the implementation thereof. These questions are:

1. What are sources of inspiration for the PBL implementation? As elaborated above, the PBL idea will reach an institution, team, or even individual teachers through social channels, and travel in the form of a de-contextualized idea. Being aware of the type of pathways, networks, and artifacts that the idea "uses" to travel into its new context will help to reflect on the process of local translation in a conscientious way. Additionally, the distinction between PBL as a prototype and as a template should be clarified in order to reflect on the nature of the inspiration (being either a prototype or a template or a combination of both), as well as the pathways the specific artifacts have taken to reach their new environment.

2. How will the interpretation of a prototype or template be influenced by the specific conditions at an institution, department, or in individual teaching? This question comes as the counterpoint to the first, because as much as we must ask about the nature of the inspiration, we must also ask about the local adaption of a PBL idea being implemented. Creating this awareness about the specific translation will help to position the concrete PBL implementation in relation to the inspiration, to disentangle the pathways of this modification, and to relate them back to the "original" prototype or template. Also, the question about who the "institutional entrepreneurs" (Czarniawska, 2009, p. 424) are that help to promote the PBL idea must be raised here, and how they eventually influence the local interpretation.

3. How can it be ensured that the PBL idea is not adapted only ceremonially, i.e., under which conditions are feelings of relevance and of appropriateness created with the actors involved? As mentioned above, a joint feeling of relevance is essential for the translation of the PBL idea into enacted practice (e.g., Kolmos, 2010). This requires conscientious efforts, because "ideas do not flow automatically" (Sahlin & Wedlin, 2008, p. 225) but need to be transported to those enacting the idea. In order to achieve that Kolmos & de Graaff (2006; referring to Kotter, 1995) have pointed out that a sense of urgency for the implementation has to be created by higher education leaders. However, other strategies can also be elaborated, such as creating a community of practice amongst faculty (Spronken-Smith & Harland, 2009).

4. How is variation of the PBL idea throughout an institution handled? As explained, through the lens of translation theory, variation must be treated as the norm when an idea travels—from one institution to another, but also throughout an institution. In light of this, PBL implementation initiatives should adopt a conscientious approach towards the fact that this variation will occur. Actively providing ample space for variation and encouraging it could be a fruitful strategy, because variation in local practice can be seen as a necessary and welcome result of successful transfer. However, boundaries and rules on these variations also need to be discussed and researched; these can, for example, be found in the underlying notions about the nature of teaching and learning (e.g., Moust et al., 2005).

5. How is failure of PBL implementation to be interpreted? Last but not least, based on translation theory's assumptions, the question of what counts as failure in the wake of a PBL implementation can be raised. As mentioned before, some authors have stressed that poor PBL implementation can be seen when the PBL principles are executed poorly and non-consistently with current knowledge on learning processes (Dolmans et al., 2005; Moust et al., 2005). It certainly is true that every educational change should be well-aligned with its underlying pedagogical principles. However, as also pointed out by Wijnia et al. (2019), when implementing PBL "teachers need to ask themselves what type of knowledge they want their students to learn and what types of problems and learning activities are most suitable to obtain these objectives" (p. 290). A good pathway for leaders and faculty implementing PBL in their institutions, groups, or individual teaching therefore might be to develop their own program theory (e.g., Rogers et al., 2000) about the intended outcomes of the implementation. Within that, a discussion about criteria of success and failure of the implementation can be held, and boundaries of implementation variation can be defined.

Understanding PBL implementations: uncharted territories

In a final part of this article I want to point out some aspects of PBL implementation that remain uncharted when discussed through the lens of translation theory. Like every theory, this one is also a work in progress, and there are certainly territories not yet explored with this analytical framework.

First and foremost, there is no solution to the question of whether it is altogether valid to apply a theory targeted at understanding the implementation of management ideas to the phenomenon of educational change. Translation theory and Scandinavian Institutionalism have been conceived mostly in the study of public institutions, and empirical evidence has been created with a focus on the implementation of concepts such as new public management, lean management, total quality management, etc. (Boxenbaum & Pedersen, 2009).

Whether a pedagogical idea such as PBL qualifies for the same treatment as a managerial concept is a question for debate; more elaborate scholarly analysis of this subject is yet to be conducted. It can be argued that one distinctive feature of a management idea vs. a pedagogical idea is that the latter requires a strong intrinsic rooting to prevent ceremonial adoption. Teachers need to be familiar with a pedagogical idea on a cognitive level as well as based on beliefs and values to bring it to life (e.g., Bailey, 2013). Other pathways and efforts might thus be required to facilitate a pedagogical idea throughout an institution, while management ideas, at least to a certain degree, can be implemented with a somewhat stronger top-down approach. However, for the time being we must assume that PBL implementation certainly can and will also happen as a top-down process (e.g., de Graaff & Kolmos, 2006b). Therefore, at least to some degree this pedagogical approach can also travel to become a management idea, theoretically. However, this will still happen in an institutional environment with flat hierarchies and an inert self-understanding of individual freedom based on scientific expertise (Pellert, 1999) as well as more or less collegial steering mechanisms (Scholkmann, 2011). Against this background, questions of institutional entrepreneurship—i.e., about the specific drivers for the implementation (Czarniawska, 2009)—must be given special consideration when studying PBL implementation as a managerial concept.

In connection with this, a second uncharted territory is the sphere of power dynamics, which certainly will also be present in PBL implementation as well. Although the PBL literature almost ritually addresses leaders and policymakers when voting for its implementation and further development (Dolmans et al., 2002; Rossano et al., 2016), the phenomenon of actual political dynamics when implementing it has not, to my knowledge, yet been researched in detail. Waeraas & Nielsen (2016) have pointed out that power has not been a focus of the Scandinavian Institutionalist perspective. However, another strand of translation theory, rooted in actor-network theory and the sociology of translation (e.g., Callon, 1984), could be helpful to better understand how power dynamics and (micro-) political maneuvers contribute to the circulation and imitation of pedagogical ideas (Nicolini, 2011). With the proposed distinction between PBL implementation at the inter-organizational, intra-organizational, and individual level it can be assumed that these may take different forms. This can be seen, for example, when an entire institution is trying to shift towards the PBL paradigm—potentially resulting in micropolitical maneuvers of faculty who do not appreciate this transition—versus a single lecturer introducing PBL into their teaching "below the radar"—potentially causing dynamics with colleagues and superiors. In this perspective, researching power dynamics when implementing PBL can hold rich and informative value in order to understand the dynamics and politics of educational change in the broader sense.

A third uncharted part of the PBL implementation landscape is the question of rules and boundaries set by the specific institutional field in which it happens, i.e., institutions of higher education. It has been elaborated that institutions of higher education follow rules based on their positioning as a specific type of bureaucratic institution (Musselin, 2006). This means—as is also claimed in new writings on translation theory (e.g., Røvik, 2016)—that universities (and organizations in general) also will converge, applying shared norms and rules in order to constitute them as the organizations they are as a group. Existing examples of PBL implementation (and its variations) could provide a textbook-like case study to examine this further, and to disentangle the uniqueness of a local solution form the generic field-specific rules and restrictions when editing the PBL idea.

In sum, it can be said that, as elaborated in this article, variation in PBL implementation needs be understood not as a mistake but as the norm, and should be embraced, not condemned. Seen through the lens of translation theory, there is no need for feelings of frustration at the heterogenous and sometimes "messy" outlay of the PBL landscape. Instead, integrating translation theory's focal points as reflective questions into PBL implementation processes can help to shape awareness about the uniqueness of the local interpretation of the PBL idea and provide a tool for joint conversations of stakeholders during the implementation process. Moreover, studying PBL implementation (and its uncharted territories) through this lens may also hold the potential to gain deeper insights about educational innovation and change processes on a broader basis. However, the discussion in this paper can only be a starting point: more thorough analysis, both on the general assumptions of translation theory and on PBL implementation processes, is yet to follow.

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