Learning between projects: More than sending messages in bottles

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Abstract

Although learning from projects has gained much importance in research and practice, progress in understanding and improving inter-project learning appears to be slight. We argue that the adoption of a sender/receiver approach limits the learning effectiveness in project-based organisations. Drawing upon the notion of learning as a social activity embedded in an organisational context, we develop the argument that learning from projects takes place within projects rooted in the historical, organisational and cultural context of previous and current projects. We underpin our argument with results from a multiple-case study on learning in construction organisations. We show that learning cannot be segregated from immediate practice and occurs when individuals engage in project work. Particularly the orientation towards project goals and project-overarching ambitions or trajectories can serve as contextual binder for learning in and between projects.

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1. Introduction

For more than a decade, learning from projects has received much attention in practice and research. Driven by the intention to improve the performance of project-based organisations (e.g. in construction, aerospace, motion pictures) numerous studies have been conducted to identify barriers and enablers for learning from projects (e.g. Holzmann, 2013; Kumaraswamy and Thorpe, 1996; Shokri-Ghasabeh and Chileshe, 2014; Swan et al., 2010). Yet despite the efforts made, progress in improving the learning from projects appears to be slight. Project-based organisations seem to be caught in the learning paradox of projects (cf. Bakker et al., 2011). Due to their fluid, temporary and interdisciplinary nature, projects are seen as suitable organisational units for stimulating learning and creating knowledge (Ayas and Zenuik, 2001; Edmondson and Nembhard, 2009; Schindler and Eppler, 2003). However, it is also argued that the ephemeral nature and discontinuities of projects restrict the assimilation of the created knowledge by other organisational units and its enhancement over time (Bresnen et al., 2003; Swan et al., 2010).

Besides identifying problems and difficulties in cross-project learning, previous studies investigated a number of tools for extracting and disseminating lessons learned such as post-project reviews, company intranet or face-to-face meetings (e.g. Maqsood et al., 2006; Koners and Goffin, 2007; Newell and Edelman, 2008; Paranagamage et al., 2012). The majority of these studies, often implicitly, adopt a sender/receiver perspective on learning which assumes the possibility of engineering communication channels for transferring knowledge between projects and “lubricating their operation with the proper tools and motivated context” (Kasper et al., 2013, p.334). We argue that particularly this core assumption that knowledge is a transferrable commodity accounts for the little observable progress in understanding and enhancing project learning activities. To be clear, we do not reject the sender/receiver approach, but we argue that within the contextual boundaries of project-based industries the sender/receiver conceptualisation of learning has its limitations and calls for alternative approaches.

Drawing upon the notion of learning as a contextually embedded social activity, we propose such an alternative approach.
Although the social and situated nature of learning has received much attention in research on knowledge creation in organisations and projects, its role for the learning between projects is less understood. Clearly, many previous studies revealed the importance of social interaction and processes for the knowledge transfer in project environments (e.g. Paranagamage et al., 2012; Roth, 2003; Wiewiora et al., 2013). However, from the perspective of these studies, social interactions are still channels or tools for the transmission of knowledge between one individual/project (sender) and another individual/project (receiver) (Noorderhaven and Harzing, 2009). Contrary to the sender/receiver perspective, we regard social interactions as contextually embedded and collaborative efforts in projects from which learning occurs. From our point of view, learning across projects takes place within projects as a social activity rooted in the historical, organisational and cultural context of previous and current projects (the imperative of continuity). We specifically argue that the goal orientation of project-based activities can and should serve as a contextual binder between projects, giving the social interaction within projects focus and orientation for the learning from projects.

In the following we develop our argument based on the project-based and situated learning literature. By referring to the results of five case studies on learning from projects in construction organisations, we then intend to juxtapose the effectiveness of the sender/receiver approach and social learning approach for learning from and between projects. Based on that, we discuss the limitations of transferring lessons learned and the goal-oriented learning from projects in projects. We also address practical implications and the limitations of our research.

2. Conceptual background

2.1. The sender/receiver approach of learning

The sender/receiver approach of learning is based on cognitive learning theory that describes learning as an individual’s acquisition of abstract and general knowledge delivered by knowledgeable sources (e.g. books, experts) and changing the mental models of the individual (Elkjaer, 2003). It is much connected with the view of knowledge as an “objectified transferrable commodity” (Gherardi, 2000, p.213) which can be extracted from individuals, exists independently from context, can be stored in repositories and transferred to other individuals. Knowledge production, transfer and consumption become autonomous activities with the transfer of knowledge as central activity for learning to occur.

The transfer of knowledge implies the existence of source, channel, message, recipient and context (Liyanage et al., 2009; Noorderhaven and Harzing, 2009). It is argued that it depends on the characteristic of the sender unit, receiving unit, relationship between sender and receiver, and the knowledge transferred (Joshi et al., 2007). Given certain conditions, knowledge will flow from one unit (individual/project) to another unit (individual/project). These conditions are (Lin et al., 2005): (1) the sender unit is knowledgeable and willing to share its knowledge, (2) the receiving unit possesses the capacity to absorb the knowledge, and (3) the appropriate transmission channels between sender and receiver for the flow of knowledge exist. Transmission channels are appropriate if they allow the development of a common lexicon between sender and receiver that “sufficiently specifies the differences and dependencies of consequences at the boundaries” (Carlile, 2004, p.558).

The sender/receiver approach relies to a great extent on the storage, retrieval and transfer of explicit knowledge that can be codified and reverts to transmission channels such as electronic and document-based repositories. It also acknowledges the existence of tacit knowledge that is intuitive and unarticulated (Lam, 2000), but can be converted into explicit forms to make it transferrable (Nonaka and Takeuchi, 1995). For example, social interactions in meetings or face-to-face conversations are seen as channels for the externalisation of tacit knowledge and the transfer of this knowledge from an organisational unit that has the knowledge to another unit that does not have it (Kasper et al., 2013).

The notion of transferring knowledge appears to be appealing, since many studies on learning from projects adopted the sender/receiver approach and investigated the effectiveness of channels for the transfer of knowledge and lessons learned between projects (e.g. Koners and Goffin, 2007; Koskinen et al., 2003; Schindler and Eppler, 2003). At the same time, barriers of knowledge transfer are well documented. Reported problems include lack of time and resources to capture lessons learned (Keegan and Turner, 2001; Shokri-Ghasabeh and Chileshe, 2014), lack of usefulness of captured knowledge (Chua and Lam, 2005; Newell et al., 2006), focus on failures (Carrillo, 2004), lack of purpose (Storey and Barnett, 2000; Ruikar et al., 2007), and commitment of staff and management to knowledge sharing initiatives (Bishop et al., 2008; Williams, 2008). We argue that these barriers represent major limitations rather than unresolved problems for the learning from projects. The prevalent production structure, business paradigm and management style in project-based industries evoke these limitations. For example, lack of time can be traced back to the very limited ability of project-based firms to balance demand fluctuations (through e.g. stock-keeping or creating markets for their services). Since it is the demand that directly determines the utilisation of resources, people are often involved in several projects with their own milestones and deadlines and, consequently, face time pressure (Sydow et al., 2004; Swan et al., 2010). As a response to a changing demand rate, services, technologies and equipment are often outsourced and subcontracted per project. Many project-based firms follow a business paradigm of trade rather than production and are technology-wise empty firms, which makes it difficult for them to define a clear purpose for learning from projects (Dorée and Holmen, 2004). In addition, many projects not only entail a variety of components and equipment, but also have to process a wide range of technical, legal, environmental and organisational information that, to some extent, varies within and between projects. This makes it questionable whether a sender project is able to articulate the knowledge that might be of value to a future, but yet unknown receiving project and to generalise lessons learned to an extent that makes them digestible but still useful for several receiving projects (Bresnen et al., 2003; Swan et al., 2010).
2.2. The social learning approach

The social learning approach recognises the social and contextual nature of learning and has its origin in social learning theory (Bandura, 1977). The notion of social learning is covered by a number of related concepts such as community of practice (Brown and Duguid, 1991), situated learning (Lave and Wenger, 1991), and knowing in practice (Cook and Brown, 1999) that suggest that learning is not something that solely takes place in the human mind but occurs through the interaction of people during their day-to-day activities and as an ongoing social accomplishment (Easterby-Smith et al., 2000; Orlikowski, 2006). That is, learning emerges from collective actions and knowledge that is enacted through the participation of individuals in social processes (Gherardi, 2000). The social learning approach rests on the understanding of knowledge as socially constructed and manifest in and through practice.

The relationship between knowledge and practice is central to this understanding, and three streams of conceptualising the relationship have emerged (Gherardi, 2006; Nicolini, 2011): social containment, mutual constitution and equivalence. From the social containment point of view, knowledge is located in the relationship of practitioners who engage in specific practices. It is the social context of these practices that informally bind people together in communities (Brown and Duguid, 1991). Learning takes place as a form of socialising through which normative rules and ways of doing things in these communities of practice are shared with newcomers. The mutual constitution view sees the relationship between knowledge and practice as the interaction of two distinct, but inextricably tied ontological entities. Knowledge is possessed by individuals and groups and is used as a tool in knowing the actual engagement of individuals and groups in practice (Cook and Brown, 1999). Knowledge and knowing are mutually constituted and it is this ‘generative dance’ (Cook and Brown, 1999) that is needed for learning to occur. From the equivalence perspective, knowledge and practice cannot be separated with knowledge as an entity existing outside practice (Gherardi, 2006). Knowledge becomes the active process of knowing rather than being an object that can be transferred between organisational units (Plaskoff, 2003). It is tied to the engagement of people in interconnected practices (compared to single practice from the containment perspective) through which it is constituted (Nicolini, 2011). Knowledge and practice are ontologically equivalent and always emergent (Marabelli and Newell, 2012). Consequently, learning is regarded as part of practice which cannot be separated from any of its activities. It is bound to situations which posit ‘certain possibilities for some action and not for others depending on individuals’ former experiences and power in a specific context. Individuals are at one and the same time to be regarded as ‘products’ of their social and cultural history and ‘producing’ situations mirroring that. The individuals interact with selves, others, artefacts and contexts as just that, ‘products’ and ‘producers’ of situations” (Elkjaer, 2003, p.43). Here, the conditions of the situation are produced through reflexivity which “enables both cybernetic self-monitoring, the institutionalisation of knowledge and hence change as the result of a learning process” (Gherardi and Nicolini, 2001, p.52). Through reflexivity the knowing subject and the object of its knowledge become separated, leading to the translation of practical knowledge into theoretical knowledge that is further transformed into normative knowledge representing the operating conditions of practical knowledge (Gherardi and Nicolini, 2001).

Based on the extant learning literature, we argue that the social learning approach has the potential for enhancing our understanding of learning from projects and providing insights that the sender/receiver approach cannot provide. Our argument seems to be supported insofar as previous studies emphasise the important role of social interaction and processes for learning within and from projects (e.g. Bakker et al., 2011). However, in many studies, social interaction remains a channel in the tradition of the sender/receiver approach that accommodates the flow of knowledge “produced at one location and consumed at another” (Noorderhaven and Harzing, 2009, p.720). From the social learning point of view, social interaction is learning, i.e. the emergence and constitution of knowledge through practice. In project-based industries, practices are mainly related to the individual, social and organisational context which forms projects. This context is dynamic, history-dependent and part of a wider institutional environment. In other words, projects cannot be seen as ‘islands’ (Engwall, 2003); project-based practices emerge through the context they are producing. That also implies that learning from projects takes place within projects through practices that include organisational procedures and tools, symbolic artefacts, organisational rules and norms, experience and competence of individuals and that are connected to other projects. For the learning across projects the contextual setting of projects seems essential (Boyd, 2013; Elkjaer, 2003), since the learning will emerge from and manifest in project-based practice. It is the complex and dynamic nature of context that determines whether and how learning between projects will play out (Bresnen et al., 2004). This paper explores the contextual setting of projects for the effectiveness of learning between projects. It intends to contribute to the project-based learning literature by viewing learning between projects from both the predominating sender/receiver perspective and from the neglected lens of the social learning approach.

3. Research method

We follow a qualitative approach in order to better understand the specific circumstances of learning within project-based organisations. A multiple case study approach is adopted. Case studies are a suitable research method if deeper and more detailed insights are sought and the research is of an explorative nature (Eisenhardt, 1989). Although the learning between projects and particularly the transfer of lessons learned have received much attention in previous research, the social learning approach has been less addressed. It is particularly the overemphasized sender/receiver approach and the underexplored potential of the social learning approach in project-based learning which suggests case studies. The cases allow us both testing and developing the argument that the effectiveness of the sender/receiver approach in project environments is limited and that the social learning approach has the potential to better address the contextual setting of projects
(cf. Flyvbjerg, 2006). In line with Yin (2009), we chose multiple cases to allow for replication of results but also contrasting findings. We focused on one project-based industry, namely construction, but covered different organisations as cases within this industry. Although the focus on one industry restricts generalisation, it eases the case comparison in terms of contextual similarities and differences; the identification of the contextual nature of learning between projects.

Five cases in the Netherlands were investigated (Table 1). The first case is a medium-sized Dutch contractor in the building sector including offices, hospitals and residential houses. The second case study was conducted at the regional business unit of a large Dutch contractor active in the infrastructure sector with a main focus on road construction. The third case is the engineering corps of the Dutch army responsible for the design, building and operating of out-of-area bases. The fourth case is a functional business unit of a large Dutch public agency responsible for operating, managing and improving the national road. In addition, the unit of analysis also differs between the cases. We studied the learning process between projects (Cases I and III), the knowledge sharing between project phases (Case II) and the use of project evaluations for learning between projects (Cases IV and V). The variation of cases and units of analysis offers the possibility to reveal differences as well as similarities in the effectiveness of the sender/receiver approach and the social learning approach, both of which can strengthen our argumentation.

In each case semi-structured interviews were conducted with persons involved in project activities. The interviews were meant to put employees of the organisations in a position to reflexively reconstruct the conditions under which knowledge is generated and shared. The selection of interviewees took place on the basis of the role they play in project activities of the organisations and thus their expected contribution to and benefit from inter-project learning. Interviews were held with employees from different layers (general, project, technical management) of the investigated organisations and included unit managers, project managers, planning engineers, and foremen (Table 1). Persons with the same organisational position were selected to avoid subjectivity and reduce inconsistencies (Eisenhardt and Graebner, 2007). The interviews were recorded and transcribed. In order to overcome common method bias and improve internal and external validity and case study rigour, the data were triangulated (Gibbert et al., 2008). Organisational documents such as project reports, project evaluations, and strategy reports supplemented the interviews by providing additional insights into the way the context of learning between projects is shaped. In three cases group discussions were used as an additional means to further validate findings from the interviews. At the same time they were used as catalyst for creating conditions for inter-project learning. The participants of the group discussions (5–10 persons) also took part in the interviews.

In all cases the analysis was driven by the aim to understand the contextual nature of learning between projects and, consequently, the effectiveness of both the sender/receiver approach and the social learning approach. On the one hand, the aim was to identify the channels used in the organisations for the transfer of knowledge and the extent to which project-specific conditions were effective in supporting knowledge flow. Tools (e.g. intranet), measures (e.g. project evaluations) or organisational structures (e.g. project meetings) were characterised as channels to determine if they are able to connect organisational units and transfer knowledge between these units. On the other hand, the case material was explored to determine indicators for social learning and conditions conducive to it. Here, the focus was on interactive and social mechanisms through which knowledge is enacted and thus exchanged and developed in projects.

Table 1

<table>
<thead>
<tr>
<th>Type of organisation</th>
<th>Project activities</th>
<th>Organisational unit</th>
<th>Number of employees</th>
<th>Data collection</th>
<th>Unit of analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contractor</td>
<td>Design, building and maintenance of office, hospital and residential facilities</td>
<td>Regional business unit</td>
<td>280 (120)</td>
<td>Learning process between projects</td>
<td>15 interviews (2 unit manager 1 HRM manager 1 marketing manager 1 procurement manager 3 project managers 3 estimators 4 foremen)</td>
</tr>
<tr>
<td>Contractor</td>
<td>Building and maintenance of roads, sewer systems, runways</td>
<td>Regional business unit</td>
<td>2200 (120)</td>
<td>Knowledge sharing between project phases</td>
<td>12 interviews (2 project managers, 3 estimators, 3 planning engineers 4 foremen)</td>
</tr>
<tr>
<td>Engineering corps</td>
<td>Engineering and building of military bases</td>
<td>Support unit</td>
<td>800 (70)</td>
<td>Learning process between out-of-area projects</td>
<td>19 interviews (11 engineers, 8 supporting staff)</td>
</tr>
<tr>
<td>Contractor</td>
<td>Engineering and construction of civil, infrastructure and industrial facilities</td>
<td>Functional business unit</td>
<td>2800 (200)</td>
<td>Project evaluations</td>
<td>12 interviews (5 project managers 7 tender manager)</td>
</tr>
<tr>
<td>Public agency</td>
<td>Preparation, tendering and managing of road and waterway projects</td>
<td>Regional business unit</td>
<td>9000 (250)</td>
<td>4 project evaluations (2 tender processes, 2 project completions)</td>
<td>11 interviews (1 unit manager, 1 internal consultant, 9 project managers)</td>
</tr>
</tbody>
</table>

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4. Findings

The findings of the five case studies are summarised in Table 2. We elaborate more on them in the next sections.

4.1. Case I

4.1.1. Effectiveness of the sender/receiver approach

Within the contractor organisation, two main channels were established to support the exchange of knowledge and lessons learned between employees and projects: project documents and electronic repositories. Project documents include standardised work procedures, and general documents about procurement, quality management and information technologies. They represent accumulated knowledge with normative character and are accessible to all employees via the intranet. Documents related to specific projects such as procurement, planning and evaluation documents are stored in an ERP software and database. Here, employees can also find checklists for purchasing, work preparation and execution and can make recommendations and give tips related to checklist items. In addition, the employees have the possibility to make improvement suggestions. While interviewees indicate that the availability of standardised documents is supportive for project work, they also stress that the dissemination of lessons learned through the EPR system remains limited. The system is rarely used for suggestions or tips; project evaluations are incomplete or not stored. The interviews revealed that one reason for the ineffectiveness is the time pressure employees face. Although employees are encouraged to evaluate projects after completion, they often need to start working on the next project before the ongoing project is finished. Due to resource allocation problems of this kind, any activity such as evaluations and improvement suggestions that does not contribute to the immediate success of the current projects is given less priority. Another reason for the limited use of the EPR system is that employees perceive knowledge obtained in projects as not relevant for their colleagues and thus do not share it. They either believe that their colleagues already possess the knowledge or they think project peculiarities make the knowledge less relevant for other projects.

4.1.2. Effectiveness of the social learning approach

In this case study, meetings on different levels and with different communities are arenas for social interaction of people active in different projects and organisations. This includes weekly meetings of construction foremen who discuss cross-project related issues and problems such as resource allocation and planning bottlenecks. Since the meetings address immediate questions of ongoing projects, they are regarded as an integral part of the working process. From the perspective of the interviewees the clear focus of the meetings on planning coordination between projects stimulates the integration of knowledge from different employees and projects for the benefit and progress of the specific project. For the foremen, the meetings provide the possibility to reflexively think about their own projects, which is seen as particularly beneficial for new colleagues and novices. Pull-planning meetings of the contractor with subcontractors are another example that was reported. In these meetings all parties involved in a specific project work on a joint planning and provide input to the time and cost scheduling from their own disciplinary and organisational perspective. Again, the interviews indicate that the willingness to engage and the perceived effectiveness stem from the immediate benefit of the discussions for the project. Joint planning is the basis for the weekly work coordination on the construction site between those parties that are active in this work.

4.2. Case II

4.2.1. Effectiveness of the sender/receiver approach

From the sender/receiver perspective the case study revealed two channels for the transfer of knowledge between project phases: working documents and transfer meetings. Working documents include tender documents, calculations, work preparation, and drawings which are accumulated during a project and handed over to the next project phase. These working documents are required for the progress of the project and are seen as an effective way of providing necessary information for the task accomplishment in project phases. However, although the information from previous phases is necessary, interviews revealed that it is not always sufficient if the reasoning behind a specific calculation or drawing is not traceable from the documents. For example, for a foreman it will remain difficult to determine the risk of cost overruns if he does not know the rationale of the estimator for allocating costs to activities. The knowledge of the estimator is embodied in the cost figures but is not immediately accessible to the foreman.

Transfer meetings were introduced to give the possibility to understand the outcomes of previous project phases. They are especially established for the time after winning a tender when the entire project team is expected to meet and transfer the knowledge from the tender and calculation phase to the work preparation and execution phase. However, it was reported that the transfer meetings are ineffective. Employees do not participate; meetings are cursory affairs or are completely cancelled. The interviews revealed that time pressure decreases the effectiveness of transfer meetings for knowledge transfer. The meetings are regarded as extra workload with little added value for the ongoing work. In addition, the geographical separation of project team members and projects is regarded as an additional barrier for the meetings.

4.2.2. Effectiveness of the social learning approach

In this case organisation social learning mechanisms became manifest in the estimator/planner interaction during the work preparation phase. For the planners and foremen, as mentioned before, assumptions made during the tender and calculation phase are not always comprehensible. From tender and calculation documents alone the chain of thought of the estimator is not visible to them. The case interviews indicate that the underlying reason becomes clear to the planning engineer through discussion with the estimator preferably supported by the close proximity of both. This discussion is guided by the immediate questions the planning engineer is dealing with in his work and the required
4.3. Case III

4.3.1. Effectiveness of the sender/receiver approach

At this military engineering organisation there are several channels established and used for the knowledge transfer between employees and projects, such as team building sessions, project evaluations and design drawings. Team building sessions are annual meetings at which specific engineering topics and new developments are presented. These sessions are regarded as beneficial, since they stimulate reflection and discussion among peers. However, they are seen as insufficient to regularly update the knowledge base. For this reason project evaluations were introduced, but their effectiveness appears to be small. According to interviewees evaluations are done on an irregular basis, since they are not seen as necessary; task and time constraints regularly prompt employees to neglect them. Evaluation outcomes are centrally stored, but although interviewed employees know that evaluation results are available, they have difficulties finding them and rarely make use of them. Reasons that are mentioned include the outdated knowledge of evaluations, which is directly related to the irregular implementation of evaluations. In addition, interviewed employees criticise the unstructured storage of evaluation results, which makes it difficult for them to extract and transfer the knowledge in a new project context. Another channel are design drawings of military bases which capture design knowledge from previous projects and are used as a starting point for the base design in new projects. They are insofar effective as they become tools in the design activity enabling the reuse and adjustment of design elements for the new project.
4.3.2. Effectiveness of the social learning approach

Social learning is much connected with team interaction due to changes in team composition between projects and continuous involvement within projects. For every project a new team is constituted with team members from different disciplines such as civil engineering and electrical engineering. The team members are partly based at the overseas base and partly at the home base. Depending on the project phase and the work to be done, team members alternate between home and the overseas base. For the necessary transfer of responsibilities and tasks, a certain period of time is granted which due to the close proximity of team members in the overseas base support interaction and learning. This regular exchange of personnel in out-of-area projects becomes part of the working process, and the needed transfer periods are regarded as conducive for enacting knowledge around the specific circumstances of the out-of-area project. Although the main task is the design of military bases, staff of the engineering corps is also involved as internal consultant in subsequent phases of a base project. Engineers become responsible for the quality of base construction based on their design, which is seen as supportive for the knowledge development within a project. It is this combination of change and continuation which leads to work-related interactions crossing different projects and thus facilitating cross-project learning. Additional support comes from the policy that military personnel must change its position every few years. Despite the risk of losing person-bound experiences, this is also perceived as a chance of new perspectives and different experiences which can be unfolded in project work.

4.4. Case IV

4.4.1. Effectiveness of the sender/receiver approach

This case organisation, a functional business unit of a contractor, follows a very structured and standardised evaluation process of tenders and projects in order to use evaluation documents and workshops as channels for the exchange of knowledge and lessons learned. Steps are described and topics to be evaluated are mentioned. An evaluation form is provided, but its use is not mandatory. Despite the existence of a detailed evaluation procedure with a number of guiding protocols and forms and the open atmosphere during evaluation workshops, evaluation reports of only a third of the annual projects could be found in the central quality management system. From the perspective of interviewees one reason for this is the unclear responsibility for initiating and coordinating evaluations. Some interviewed employees see the responsibility with the management team of the business unit whereas other employees place the responsibility on the central quality management team. The reported effectiveness of the evaluations conducted is mixed. Interviews indicate that there is willingness of project members to participate in and contribute to evaluation workshops that are regarded as useful, since they allow tender and project teams to reflect on the process and outcomes and are occasions for the learning within the teams. On the other hand, evaluation documents are rarely studied to extract lessons learned for a current project. The interviews revealed that three related factors account for this: the low relevance of generally described lessons for future projects, the difficulties in accessing very detailed evaluations of previous projects, and the insufficient time for accessing these evaluations. It appears that the dilemma of evaluation documents lies in the necessity of providing contextual project information to allow for relevance judgement of lessons learned while the extended description of project context increases effort and time to transfer lessons learned for the current project.

4.4.2. Effectiveness of the social learning approach

The case study showed that social learning in project evaluations is connected to the application of evaluation results which are not stored in reports but which are made available during regular project meetings. Interviewees reported that discussions of current project issues are supported with results from evaluations of previous projects. The benefit and thus willingness to use evaluations emerged in the direct working process through their confrontation with context specific problems and challenges. However, evaluation results are bound to certain employees rather than linked to specific documents. It was stressed in the interviews that it is important to localise employees who are able to contribute to a project with disciplinary expertise stemming from previous projects. In this sense, evaluations are regarded beneficial if they focus on specific functional disciplines or topics (e.g. contract issues, stakeholder management, cost estimation) and if evaluation results are outlined in presentations. Although the latter can also be seen as a channel for the transfer of lessons learned, presentations are rather perceived as an efficient way of getting to know problems and their solutions of a specific project and affiliating staff members to the project, who then can be more easily approached for discussions on similar problems in other projects.

4.5. Case V

4.5.1. Effectiveness of the sender/receiver approach

Project evaluations are very prominent within the agency which can be traced back to the accountability as public organisation. They are regarded as tools to check the efficiency of the agency’s work processes and the effectiveness of change programmes. This has become an important aspect in recent years, since the agency has been in a transition towards a network operator placing more emphasis on the needs of infrastructure users and outsourcing core activities to private parties. Evaluations of regular infrastructure projects aim at facilitating this transition by having a closer look at different elements of the agency’s new role (e.g. contract and performance management) and informing policy making. However, although many projects are evaluated, there is no clear evaluation procedure, evaluation goals are rather general or cloudy, and concrete outcomes are often missing. Evaluations become goals of their own and thus less relevant. Not surprisingly, there is the perception among the interviewees that results of evaluations rarely find their way into new projects. Employees find it difficult and time-consuming to search for evaluation results from other agency units, but also to make their results available to these units. Evaluation results are disseminated first of all within the own business unit and channels used to transfer these results are reports and workshops. Reports are seen as less effective and are rather project documentations used to inform higher
management levels than starting points for learning in other projects or policy development. Workshops conducted after larger projects are perceived to be more effective, since higher management is not only informed about project results but also involved in discussions about implications for further projects and policy.

4.5.2. Effectiveness of the social learning approach

The discussions held during the workshops are already indicators for the existence of social learning. Lessons learned are not purely transferred to higher management levels but in an interactive way translated into consequences for the agency’s work processes. Social learning also emerges in the application of evaluation results. Evaluations become relevant at the start-up of new projects or if problems are encountered during projects. It was reported that employees then revert to evaluations of previous projects to make lessons learned available for the new project or the solution of the problems through the discussion with colleagues. What this distinguishes from the sender/receiver approach is the point that these employees were often involved in the project evaluations which are referred to. Learning does not occur through the extraction of knowledge from an evaluation report but rather through socially unfolding individual experiences from an evaluated project in the context of a new project. Interviewees report that the value of evaluations stems from the reflection among project team members that is triggered. Lessons learned are embedded in the interactions of the project team about which awareness is created through the evaluation task and to which team members revert in other projects.

5. Cross case comparison and discussion

We investigated the effectiveness of the sender/receiver approach and the social learning approach of project-based learning in five case studies from the Dutch construction industry. Being from one industry but having different units of analysis, the five cases allow for comparative generalisation with a finely nuanced discussion of empirical differences in the learning approach.

5.1. The limitations of transferring lessons learned

The five cases are very much in line with previous studies in terms of limitations of the sender/receiver approach in learning from projects. It became apparent that the transfer of knowledge from one project to another project via several channels is impeded by characteristics that seem inherent to the contextual nature of project-based organisations. Two of these characteristics are particularly prevalent and appear to be interlinked: time constraints and obscured relevance or unclear purpose. In all cases, employees lacked time to either adequately capture, store and transfer lessons learned (Case I, II, III) or search and extract useful lessons from project and evaluation documents (Case IV, V). Even in organisations that are more forced to conduct evaluations due to their public accountability (Hall et al., 2012), the actual provision and access of lessons learned are also vulnerable to time constraints (Case V). The sender needs time to capture and store lessons learned in a way that they can become relevant for the receiver, who needs time to determine whether the provided knowledge is relevant for his/her project. The inherent uncertainties and fluctuations in resource demand of project-based organisations particularly prompt employees in periods of high work load to neglect or omit activities which do not directly contribute to the progress of a project (Swan et al., 2010). Besides the time that is needed to formulate (sender) and understand (receiver) the essence of project learning, it generally remains difficult for employees to determine the relevance and purpose of particular knowledge for subsequent projects. To some extent this may be attributed to the lack of guidance and responsibility (Cases III, IV, V), but is additionally rooted in the delicate balance between generalisation and specification (Cases I, IV). Through generalisation information is lost and lessons learned are marginalised, but the potential application to future projects is increased. On the other hand, specification enriches lessons learned, but decreases their accessibility and their potential value for other projects (Bresnen et al., 2003).

From our perspective, the limitations of the sender/receiver approach emerge from the attempt to remove or at least to reduce constraints inherent to projects. The managerial fallacy of the approach lies in the assumption that the transfer of knowledge can be easily improved by making more time available and providing adequate tools for collecting and disseminating lessons learned. Based on our cases, we suggest that time constraints and unclear relevance will remain typical characteristics of project-based industries limited in their ability to balance changing demand rates. Of course, approaches to enhance the learning between projects need to address these characteristics, but they should be careful in trying to overcome and deny production structures inherent to project industries and conceptually and practically separating the learning from its context (Bresnen et al., 2004). In all five cases the ineffectiveness of learning from projects can be related to the separation of the learning from the immediate project work. Activities of capturing, disseminating and determining lessons learned were not part of the working process. As a consequence, the willingness to conduct them was very low; they received low priority or were completely dismissed. As soon as learning is understood as separate activity and detached from actual project tasks, its relevance for projects is concealed and it is perceived as an additional workload rather than as a contribution to current and future projects.

5.2. Goal-oriented learning from projects in projects

The social learning approach regards learning as a contextual emerging practice, and the five case studies could provide evidence for its theoretical and practical potential that is still underestimated. Learning from projects occurred when employees were engaged in project work. From the social learning perspective that is not surprising, since learning is seen as something that is “ubiquitous and part of human activity as such” (Elkjaer, 2003, p.43). It was the project work that triggered learning through posing problems and questions, and offering opportunities and challenges. Employees needed to coordinate project resources (Cases I, IV), understand the outcomes of previous project phases (Cases II, III), and prepare
project start-ups (Case V). In order to accomplish their tasks, they reverted to and engaged with project documentations (Cases I, II, III), evaluation results (Cases IV, V), and knowledgeable colleagues (all Cases). Particularly the orientation towards the goals of a project or single project tasks guided the integration of documents and persons in the ongoing work and, by doing so, made use of the knowledge generated in previous projects. By incorporating the knowledge generated in previous projects, documents and persons represented mediating elements in the project work rather than knowledge transfer channels between projects. Instead of purely transferring knowledge, it was unfolded through the interaction of project team members with these mediating elements directed by the goals of the specific project or task. Based on these findings, we see our initial argument supported that learning from projects takes place within projects and that, given the contextual nature of learning, it seems essential to give the learning in projects more focus and orientation so that the learning between projects is further facilitated. In this regard, reflexivity becomes an important ingredient in project work which allows employees to make their experiences explicit in project meetings with peers (Case I), bilateral discussions with project team members (Cases II, III, V), and workshops with higher management (Case IV). As such, it also becomes part of the project-related interactions of employees and should not be decoupled from the immediate working practice. Although distance from daily affairs can be supportive for scrutinizing taken-for-granted presuppositions of project work, reflexive practices organisationally separated from projects (e.g. thematic workshops) should connect to reflexive practices within projects (Høyrup, 2004). Employees not only acquire meaning and understanding from project practice through reflexivity, but also create this practice by institutionalising knowledge which is translated into design principles, organisational structures and processes, or task responsibilities (Gherardi and Nicolini, 2001). Individual experiences and knowledge gained in past projects then emerge and are integrated in current project work (Cases III, IV, V), drawings and guidelines act as tools in the interaction of employees (Cases I, III), and involvement in and commitment to projects are constituted (Cases II, III). The learning in previous projects is contextually bound to the learning in ongoing projects.

5.3. Practical implications

Our research has three main practical implications for the learning between projects.

First, managers in project-based organisations should put less effort in capturing knowledge from projects through imposing additional activities in projects, and they should rely less on transferring lessons learned via documents or electronic platforms to other projects. That is not to say the sender/receiver approach is completely ineffective in project environments. It can be effective if, first of all, it is regarded as a way of informing about project results and pointing to knowledgeable persons rather than an instrument for stimulating learning. Learning will be only facilitated if managers do not treat projects as isolated sender and receiver entities and what is regarded as learning transfer channels become part of the actual project work (Noorderhaven and Harzing, 2009). Learning needs to be regarded as an evolving process embedded in project-based practice and should be facilitated through organising the context of this practice. Here, a possible contribution of the sender/receiver approach might be the organisation of repositories by “practice” and the appointment of practitioners as moderator or ambassador per practice. These practitioners are responsible for the progress of the practice and the provision of guidance on what information should be kept per project.

Second, our research suggests that managers of project-based organisations can support cross-project learning by linking projects through strategic goals, which are translated to the specific project. They should be more explicit about the guiding goals of a single project and should relate them to the overarching goals of the organisation. Goals then become important contextual elements that can act as binders between projects. That such deliberate coupling of sequential projects may improve the learning between projects is indicated by Dorée and Holmen (2004). In their study on technology innovation they showed that a construction contractor followed a path-dependent process for developing a bridge technology through a number of sequential projects, but without having an explicit technology development strategy and being more backward-looking rather than future-oriented. They suggest a more proactive stance of contractors to become aware of their project-crossing trajectories and arrange couplings between projects.

Third, our research also shows that people and documents (e.g. drawings, contracts, manuals) embody knowledge gained in projects and that this knowledge is enacted through interaction. For managers of project-based organisation this means that they should pay more attention to the inflow and accessibility of knowledgeable employees and documents in projects (Holzmann, 2013; Swan et al., 2010). The composition of project teams, the creation of commitment and responsibility for projects, and the integration of disciplinary and cross-disciplinary meetings in projects can be suitable means to facilitate goal-oriented interaction of employees within projects. The latter should also provide the opportunity for reflexive discourses which direct attention to critical aspects of project practice in the light of the project-specific goals (Boyd, 2013). These discourses can support the identification and understanding of lessons learned but at the same time can stimulate the adjustment and modification of documents but also organisational structures (e.g. task distribution, responsibilities) and technologies (e.g. software, machinery) within a project and the assessment of their implications for other projects and an organisation’s strategy.

5.4. Research limitations

This research has some limitations because learning was not investigated as part of the evolvement of project practice. It relied on the ability of practitioners to reflect on their practice and the occurrence of learning. In their accounts the sender/receiver approach got more attention, which may be explained with the appealing promise of the approach to engineer and control the learning process. The social and contextual aspects of learning became primarily apparent through narratives around project work.
Although narratives are suitable vehicles for grasping complexity and alternative views of practice in a reflective manner (Heylighen et al., 2007; Koners and Goffin, 2007), they remain ex-post representations of practice that may miss part of this practice through which learning occurs. Possible alternatives are ethnographic-based studies that are able to address the evolving and transformative nature of project practices and thus the contextual emergence of learning. They can provide more intimate insights into the historical-infused interplay of individual, organisational and institutional factors in projects and their interrelatedness with learning. Of particular interest could be how cross-project trajectories are formulated and translated into activity-guiding objectives within projects and which role individuals and tools play in connecting different projects. A further worthwhile direction for research is the extent to which characteristics of project work are relaxed in organisations that are not completely structured around projects. Thus, the effectiveness of learning approaches may play out differently. Compared to our five cases from the construction industry, other organisations may use projects along other organisational forms and are less vulnerable to uncertainties and fluctuations in resource demand. Single projects may receive other priorities for knowledge development (e.g. R&D projects) and in the institutionalisation of knowledge (e.g. change projects). The learning may then oscillate between the project and the organisational level, and organisations may embark on different learning trajectories (Hartmann et al., 2010). Nonetheless, the learning will remain part of the immediate project practices, and the challenges for learning from projects lie in transcending these practices by identifying and establishing mechanisms that are able to contextually connect projects.

6. Conclusion

The sender/receiver approach of learning appears to be very attractive for the learning between projects, since projects seem to form distinctive entities of temporary nature and with organisational boundaries, which make the transfer of lessons learned between them necessary and plausible. Although from the sender/receiver perspective the difficulties of cross-project learning are well recognised, both research and practice continue to predominately rely on the approach. However, as our five case studies from the construction industry revealed, if projects are perceived as sender/receiver islands, then lessons learned remain “messages in bottles” — freely afloat on the ocean of knowledge, arriving at new shores by chance. Our case findings suggest that an approach of learning between projects should consider the individual, social and organisational context through which projects are formed and which is constantly produced by project activities. Projects are not sender/receiver islands. They are connected through their organisational setting, tools and norms, and the experiences of project team members. Our research clearly indicates that particularly the orientation towards project goals, project-overarching ambitions or developmental trajectories helps in facilitating the learning. Learning between projects then becomes more than sending and receiving lessons learned. It is a social accomplishment taking place within projects and through goal-oriented activities that enact knowledge embedded in the interlinking project context.

References

Hall, M., Kutsch, E., Partington, D., 2012. REMOVING THE CULTURAL AND MANAGERIAL BARRIERS IN PROJECT-TO-PROJECT LEARNING: A
CASE FROM THE UK PUBLIC SECTOR. Public Administration 90 (3), 664–684.


