Lack of Managerial Learning as a Potential Cause of Project Failure

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Abstract
This paper focuses on (1) lack of managerial learning within a project as a potential cause of failure and (2) methods to investigate managerial learning in projects. Three levels of learning are distinguished: operational learning, managerial learning and organizational learning through projects. Current research on these are briefly explored. Lack of learning rarely appears on any of the top-ten Failure-factor lists despite the fact that learning is increasingly recognized as an integral part of project management. Several reasons are mentioned to explain this discrepancy. One of these, namely limitations in the dominant methodology, is explored further. It is argued that other methods are needed to uncover the influence of learning on project performance. One particular method is described in more detail.

Keywords: Projects; Learning; Success & failure; Operational; Managerial

Introduction
Project failure is defined here as: abortion of a project or completion of a project in a state where (a) the schedule and the budget have been seriously overrun, (b) the product does not satisfy the previously agreed requirements and (c) the value of the project has decreased significantly between start and completion. Potential causes of project failure (and success) have been investigated extensively (see for instance Cooke-Davies, 2004, for a recent overview and analysis of these studies).
Almost all investigations in this area take a project as a temporary organization which is aimed at accomplishing a unique performance effect. The degree of uniqueness may differ among projects, but in every project there is at least one area of risk and uncertainty which may endanger the objectives of the project. Risk and uncertainty point at a lack of existing knowledge and experience. Hence, the uniqueness of a project implies that some learning effect must, of necessity, also be accomplished. From this perspective it is rather amazing that lack of learning within the project has rarely been indicated as a potential cause of

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failure in the above mentioned investigations. Of course failure factors have been identified that can somehow be related to learning at the conceptual level. In the historic study by Baker et. al (1974), these are “Inadequate control techniques” and “Abundance of bureaucracy”. In the often cited study by Pinto and Slevin (1988) these might be “(lack of) Client consultation”, “(lack of) Monitoring and feedback” and “(lack of) Troubleshooting”. Nevertheless, one might expect that lack of learning as such would appear somewhere on the top-ten Failure factor lists. For learning has often been mentioned as a an integral part of project management (Bredillet,2004; Cooper et.al., 2002). Also, in several established application areas of project management - such as in product innovation, information systems development and in building and construction- one can find many examples of dedicated methods and procedures to stimulate and improve learning within the project. These are, for instance, Prototyping, Field experimenting, Simultaneous Engineering, Learning Curve Analysis.

Hence, the importance of learning is certainly not ignored, in research or in practice. Why then does learning not appear in the top-ten Failure factor lists?

Several hypotheses can be suggested. First, it is possible that the empirical research to date proves us wrong: we might think lack of learning is a potential cause of failure, but it is actually not. Second, empirical research to date has in majority not included learning as an operational variable in its research design. Third, the whole concept of (organizational or project related) learning is insufficiently developed to allow researchers to systematically include learning into their studies. Fourth, the common methodology of empirical research looking for success and failure factors hampers the detection of differences in learning processes.

Something can be said in favour of each of these hypotheses.

(1)Many projects border on routine tasks. For instance, projects delivering small variations of semi-standardized products to customers in the same or similar markets; e.g. repetitions of training programs in different organizations, but delivered by the same contractor. Learning occurs everywhere and anytime, but in these projects learning is perhaps not essential to delivery on time, within budget and according to specification and to maintaining or increasing the value of the project. Routine and experience are, for that matter. In fact, one might even argue that too much learning (re-inventing the wheel) is more of a danger than a benefit in such projects.
(2) Scanning a number of empirical investigations into the causes of failure and success it appears that very few investigators have included learning (or lack thereof) as a separate variable in their study (Storm and Jansen, 2004). Also, as shown by Belout and Gauvreau (2004), it makes a difference how variables related to personal competence are included in the study.

(3) The concept of organizational learning is still being developed. When looking for instruments to measure this phenomenon it is striking how differently the concept is operationalized (Garvin, 2000). Researchers still debate with each other about the main dimensions of the construct and compete with each other in trying to show their particular measure is the most valid and reliable (Chan et. al., 2003; Friedman et. al, 2005)).

All three hypotheses merit further investigation. However, in this paper we will primarily explore the fourth hypothesis mentioned above.

Storm and Jansen (2004) and Partington et. al. (2005), among others, have made critical remarks about the common methodology applied in comparative field research on success and failure factors in project management. The methodology relies in majority on:

- One-shot comparisons using
- Surveys
- Exploiting one source only.

This method allows one to identify potentially important factors, but it is inadequate for identifying causal relationships. Also it limits the potential of these studies for including learning as an explanatory variable because surveys are, by definition, not suitable for identifying processes which lead to accumulation and distribution of tacit knowledge (Bredillet, 2005). And it does not fit the phase system nature of projects (Storm and Jansen, 2004).

Hence, there appears to be a gap in our empirical knowledge regarding the importance of learning (or lack thereof) to successful project management.

**Operational Learning in projects**

The topic of learning in projects has attracted the interest of researchers, particularly in three areas: (1) operational learning as expressed in a learning curve for repetitive tasks and a rework cycle for unique tasks (Eden et.al, 1998; Arditi et.al, 2001; Lam et. al., 2001; Cooper et.al., 2002), (2) post-project evaluation aimed at finding the “lessons learned” in a project to be applied in future projects (Busby, 1999; Cooper et. al., 2002; Schindler and...
Eppler, 2003); this stream of research we will place under the heading of managerial learning and (3) project-based learning, which has been presented as an effective tool for implementing objectives of organizational learning (Rhodes and Garrick, 2003).

Operational learning in projects is defined here as: learning which takes place during the execution of operational tasks by the people who execute these tasks. Operational performance can be measured in different ways. But in general, productivity is the most widely applied variable here. Research on productivity in projects is heavily based on Wright’s Law. This law states that “for any operation which is repeated, the mean time for operation will decrease by a fixed fraction as the number of repetitions double” (Eden et al., 1998). Repetition of operational activities occurs in any project. Invalid estimation of operational learning may lead to more or less serious deviations from expected performance of the project (Arditi et al., 2001). Validity of estimation is strongly influenced by such factors as: experience and availability of historic data for the particular type of project at hand, disruptions caused by changes, (Eden et al., 1998), activity complexity and job conditions (Arditi et al., 2001).

Another line of research on operational learning focuses on the Rework cycle. Cooper et al. (2002) have shown how learning about the causes and remedies of rework can significantly improve project performance.

It can be concluded that research, over many years, in this area has shown that lack of operational learning may have a strong influence on project performance.

Managerial learning in projects
Unfortunately, the same cannot be said of managerial learning in projects. It is assumed but largely unproven that managerial learning is of importance to project performance. Managerial learning in projects is defined here as: learning which takes place during the execution of management tasks in the project by the people who execute these tasks. These management tasks may take place at any level of the project: top-level, subproject level, systems level, subsystems level, etcetera.

Most research on managerial learning in projects, it seems, has focused on project evaluation.

Schindler and Eppler (2003) have reviewed different methods to improve the transition of knowledge gained during a project to subsequent projects. They distinguish Process-based
methods, such as post-project appraisals, from Documentation-based methods, such as learning histories consisting of the main events of a project arranged in chronological order. According to Schindler and Eppler project evaluation occurs scarcely in practice. Key success factors for improving project learning are:

- Going from single review to continuous project learning
- Establishing new project roles, such as that of the debriefer
- Institutionalising the lessons learned process, especially by integration of learning into project goals.

Busby (1999) investigated more precisely what goes on during post-project reviews. He observed that Dialectic argument, Event rehearsal and Mental simulation are often used. His conclusions from observing several review meetings, are that:

- Post-project reviews are effective in disseminating knowledge about good practices and correcting errors in individual’s knowledge.
- Diagnoses during reviews tend to be shallow, remedies are planned only at a very superficial level and explanations tend to be overly specific.

Although specific cases have been used to illustrate the value of project reviews (Cooper et. al., 2002; Schindler and Eppler, 2003) it has not been shown that, in general, project reviews lead to better project performance. Perhaps this is not amazing given the limited learning effect of project reviews (Busby, 1999).

**Organizational learning through projects**

Project-based learning is “the theory and practice of utilizing real-work assignments on time-limited projects to achieve mandated performance objectives and to facilitate individual and collective learning” (Rhodes and Garrick, 2003, p. 451). Project-based learning is based on such well-established methods as:

- Action research as associated with Lewin
- Action learning as promoted by Revans
- Action science as introduced by Argyris and Schon
- Communities of practice as developed from the work of Wenger.

Project-based learning is considered to be an effective way of implementing objectives of organizational learning if and when certain conditions are created and maintained (Ayas and Zeniuk, 2001; Arthur et. al, 2001). These conditions are:

- Psychological safety for all involved in project-based learning
• Leaders act as role models
• A common sense of purpose (what makes this learning process important?)
• Systemic and collective reflection
• A dedicated learning infrastructure
• Communities of practice in which a variety of competences and responsibilities are brought together.

In project-based learning the aim is to accomplish (a) a high degree of project performance and a high degree of learning and (b) a rapid deployment of learning results throughout the organization. The apparent success of project-based learning, in those cases where it has been applied under the appropriate conditions, is usually explained as follows:

• Projects often involve a large number of people with no or weak ties outside of the project. This promotes variety in competences and responsibilities during the project and a wide spreading of learning results after the project.
• Project often have focus and urgency. This promotes the intensity and speed of learning.
• Project often lead to the discovery of new or unexpected problems. This may stimulate creativity.
• Power differences are often smoothed or lowered during projects. This may lower anxiety and defensiveness and hence promote curiosity, reflection and exploration.
• Leadership in projects is often more visible and explicit. Hence, the role model function of the leader can be expressed more clearly.

It appears that there still is a wide gap between the ideal and the reality of project-based learning. Although many organizations acknowledge the need for conditions such as described above, most of them still struggle with the limitations of available time and resources to actually create and maintain those conditions. Also, most reports on the successes of project-based learning are based on a limited number of cases studies. There seems to be no proof of any wide-scale successful application.

So far, three areas of learning in projects have been briefly reviewed: operational learning, managerial learning and organizational learning. Of these, managerial learning is the least known. In the remainder of this paper we will focus on managerial learning.
When and where can lack of managerial learning lead to project failure?

Lacking clear empirical evidence we must resort to logic for the moment. In general, managerial learning is needed most when:

- External conditions, such as the local culture, deviate from those hitherto known by project management.
- Managerial and contractual arrangements are complex.
- Project size is larger than project management is accustomed to.
- Project goals are mutually conflicting.
- Project initiation is extremely short (emergency projects).
- Unproven technology is being applied or when proven technology is being applied in new fields.

This list is indicative, not exhaustive. In each of these cases established management procedures will not work as intended. Project management must learn what the positive and negative effects or their habitual management actions and reactions are. In many of these cases the management of a project is not put into one hand. Hence, managerial learning is often a collective effort. Also, for many of these kinds of projects time presses on. Therefore, managerial learning is needed most when it is least likely to occur naturally (Loosemore, 1998).

What hampers managerial learning?

Cooper et al. (2002) state “A number of conditions have contributed to and perpetuated the failure to systematically learn on projects. First, is the misguided prevalent belief that every project is different. . Second, the difficulty in determining the true causes of project performance hinders our learning…Third, projects are transient phenomena, and few companies have (sufficient resources) for the very purpose of gleaning and improving upon transferable lessons of project management…Fourth, while there are individuals who learn, their limited span and career path make systematic assessment and learning of transferable lessons that get incorporated in subsequent projects extremely difficult” (p.213-214).

These four factors heavily influence lack of learning between projects. However, learning between projects is only on side of the coin. The other, possibly much more important, side is learning within a project. Managerial learning within projects may be restricted by the following:
• Project management is more of a “loner’s” job as compared with many other management functions. Project managers have fewer opportunities for sharing their experiences with and transferring their knowledge to others. Transferring or sharing knowledge with colleagues will not benefit the project manager directly.

• Project managers work in unfamiliar or even hostile environments, more than most other managers. These environments are less “safe” and open. Projects managers must be more aware of the possible existence of hidden opponents. Free information sharing is not always really free.

• Project manager effectiveness is more difficult to assess on the basis of direct observation. Feedback on individual project manager effectiveness, whether positive or negative, tends to be subjective. Project managers have less reason to believe that those who evaluate them really know what is going on in the project.

• Projects are, by definition, short lived, performance oriented organizations. Established organizations with a capacity availability orientation (such as fire brigades, laboratories,...) have both the means and the tradition to learn between performances. Project managers have to learn “on the run”; there is no time for training sessions between matches.

Hence it is unlikely that managerial learning in projects is stimulated extensively and explicitly. Also it is not structured and systematized (Cooper et. al., 2002) To the extent that managerial learning in projects occurs, it will often be more or less hidden.

About knowledge and learning in organizations
Learning encompasses creating, acquiring, transmitting, applying and testing knowledge. But what is knowledge? As Bredillet (2004) notes, there are at least two rather different epistemological perspectives on the concept of knowledge. “The positivist perspective treats knowledge as something people have….it tends to promote explicit over tacit knowledge and individual knowledge over team or organizational knowledge” (Bredillet, p. 1114). The constructivist perspective “reflects the knowing found in individual or team practice, knowing as intelligent action” (Bredillet, p. 1114). This is knowledge hidden in what people do. Bredillet advocates an integrative epistemological approach suggesting that “organizations will be better understood if explicit, tacit, individual and
team/organizational knowledge are treated as four distinct forms of knowledge…Thus knowledge may be seen as an input of knowing (and vice versa)”(p. 1114).

Knowledge is acquired through learning. Different levels of learning have been distinguished in the literature. Senge (1990), for example, separates adaptive and generative learning. Adaptive learning is concerned with developing capabilities to manage new situations by making improvements and amendments. Generative learning focuses on developing new perspectives, options, possibilities and definitions. Argyris and Schon (1978) distinguish two levels of learning: single-loop learning (questioning how things are done) and double-loop learning (questioning underlying purposes or why things are done). Both adaptive and single-loop learning are generally viewed as natural, while generative and double-loop learning are considered desirable yet hard to create within organizations.

The organizational context may inhibit learning, especially generative learning. Argyris draws attention to the ways in which hierarchical structures often deny any potential for openness, questioning and confrontation by discounting alternative perspectives, by encouraging deference and defensiveness and discouraging debate which might be seen as challenges to authority. Salaman and Butler (1994) point at the influence of asymmetrical information flows and political conflicts on learning. Bredillet (2004) points at several other learning disturbances, such as role-constrained learning, superstitious learning and fragmented learning.

**How to investigate managerial learning in projects?**

In this paragraph we will specify requirements for effective investigation of managerial learning in projects. The purpose of such an investigation is to test hypotheses about the nature and degree of influence of managerial learning on the performance of projects. Taking the preceding review into account, we consider the following requirements as important:

1. Managerial learning should be distinguished from operational learning and organizational learning. Managers, workers and organizations are distinct entities. It should not be assumed that if learning takes place within one of these entities, similar learning will occur in the others.
2. Learning should be viewed as a process. In order to understand the causes and effects of managerial learning, we must first be able to somehow describe this process.

3. The process of learning should be investigated synchronously with developments in the context of learning. The context of learning changes repeatedly within projects. During project initiation the context is quite different from the context as present during project realization.

4. More than one ideal-type of the process of learning should be used as reference for interpreting observations and other data. Learning is a concept with different meanings. The process of learning is a complex phenomenon which can only be described with the aid of simplified or ideal-type models. It seems unlikely that any one of these models represents the reality of learning to a satisfying degree. Using two or more ideal-type models simultaneously may help us to understand which model has more explanatory value under which circumstances.

5. A multiple of projects should be included in the investigation. Research on the causes of project performance has been dominated, so far, by cross-sectional surveys including large numbers of projects. Research on learning in projects, particularly the Project Based Learning stream of research, has been dominated by non-comparable case studies. What we need now is a stream of longitudinal research in which a multiple of projects is included.

6. The comparability of the projects involved should be assessed or, preferably, controlled. It is quite likely that type of project has an influence on learning within the project. It has been shown, for instance, that learning is less likely in short-term project teams with a strong performance orientation (Druskat and Kayes, 2000).

With these requirements in mind, different research designs can be developed. In the following paragraph one particular design is described.

A proposal for investigating the nature and degree of influence of managerial learning in projects

Satisfying these requirements in actual field research will not be an easy thing. Several dilemmas emerge. Such as:
• If the integrative epistemological perspective (as proposed by Bredillet, 2004) is taken, then “knowledge in action” must be investigated as well as “knowledge in possession”. However, to investigate “knowledge in action” the researcher must be rather involved in, or at least very close to, that action. But, being involved may imply influencing the process of learning itself.

• Investigating the actions and corresponding learning behavior of project managers over the course of their projects requires heavy investments on the side of the researcher as well as on the side of the project managers. The risk that these investments will not pay off as expected are high. The dilemma is that the greater the length and depth of the study, the higher these risks will be.

• Selecting similar projects will increase comparability but reduce the chance of finding strong variances in learning.

The quintessence of these dilemma’s, it appears, is to design the investigation in such a way that it optimizes the usefulness to both the researcher and the practitioner. Mohrman et. al. (2002) have tested various hypotheses regarding ways to increase the perceived usefulness of research to practitioners. The results suggest that the following measures may help to increase the perceived usefulness:

• Action planning is related to the research effort
• The research enables dialogue within the organization
• The research uses joint interpretative forums
• The research promotes mutual perspective taking.

Taking these suggestions at heart the following research proposal is made.

A sample of organizations is approached with the request to participate in a research project to investigate managerial learning in projects. The proposal made to these organizations states that:

• It concerns a longitudinal investigation, covering the whole length of the projects involved.
• Project managers and their projects are the objects of investigation. Each organization participates through two project managers, each managing his or her own project.
• The managerial behavior and the learning behavior of the project managers are the aspects of investigation.
• Managerial behavior is investigated on the basis of a common model of project management, derived from previous research on success and failure factors of projects.

• Learning behavior is investigated on the basis of two different perspectives. In one perspective learning is defined as “observable changes in knowledge (about project management) following the explicit (re)interpretation of experience” (this represents more less the positivist perspective). In the other perspective learning is defined as “observable indications of single and double loop learning” (this represents more or less the constructivist perspective). In other words: *what* is learned is the crucial thing in the first perspective; *how* learning takes place is crucial in the second perspective.

• The investigation will be executed in such a way that it will benefit the participating project managers and their organizations. Specifically this means that: action planning is related to the research effort, the investigation will enable dialogue within the organization, the study will use joint interpretative forums and it will promote mutual perspective taking.

• The investigation will be executed as a joint effort between the researcher and the participating organizations as well as between the organizations.

To facilitate the decision making of the potential participants a series of workshops is held to explore purposes and methods of the study and, as least as important, to foster bonding among the representatives of the organizations.

After the Go-NoGo decision has been taken by the organizations, the following steps will be taken:

• Organizations select their projects and project managers
• Data collection instruments are developed on the basis of a model of project management
• A program schedule is developed
• Project managers are interviewed and briefed
• Physical and logistic arrangements are made
The model of project management which will be used in this investigation assumes that a project manager can influence the behavior of his project through three different general means:

1. *Project control systems*, such as schedule control, budget control, change control etcetera.
2. *Project leadership*, such as problem solving leadership, team leadership, coaching etcetera.
3. *Project governance*, such as business cases, steering committees, contract strategies etcetera.

The total number of imaginable managerial actions that can be taken by a project manager, through these different means, is very large. In order to keep the model comprehensible, both to the project managers and to the researcher, a maximum number of fifty different actions will be included in the model. These fifty actions will be derived from the literature on project management. Results of empirical research on success and failure factors will be used for guiding the selection of these actions.

A schematic representation of the model is presented in figure 1.

![A model of project management](image)

**FIGURE 1 A model of project management**

The straight lines in this model represent assumed causal relationships. The dotted lines represent feedback loops.
Project behavior is represented by three general categories:

1. Behavior that fosters alliance. which can be described as the degree to which all of those who are expected to contribute directly to the project (a) share a common goal, (b) acknowledge the necessity of the contributions by the others and (c) accept the risks of the project. Behavior that fosters alliance is essential to a project, as any project is a temporal alliance of parties with different interests.

2. Behavior that fosters focus. Focus means having a clear vision on the results, the scope and the strategy of the project. Behavior that fosters focus is equally important to a project as the parties involved in a project must adapt their vision to new knowledge that is gained during the project and to changing circumstances in the environment of the project.

3. Behavior that fosters momentum. Momentum means a positive increase in the speed with which a project is progressing. Progress refers to all the essential processes within the project. These are for instance, mobilisation of resources, defining core problems. Searching for potential solutions, deciding on preferred solutions. Behavior that fosters momentum is important because all projects follow, to some degree, a curvilinear path (the S-curve) in their progress from start to finish.

In the basic model project behavior is represented by twelve variables

Project performance will be represented by two categories:

1. Project management performance, as expressed by such well established variables as schedule performance and budget performance.

2. Project performance, as expressed by such variables as owner satisfaction, user satisfaction and contractor satisfaction with the results of the project.

In the basic model performance is measured through six variables.

The basic model will be presented to the participating project managers as a point of departure for designing their own models. Hence each project manager selects from the basic model those aspects and variables which represent his or her best working knowledge on project management. Deviations from the basic model will be allowed. However, each deviation should be motivated on the basis of concrete experience. Deviations and their corresponding motivations will be recorded by the researcher. Thus, a start is made with dialogue and mutual perspective taking.
From there on the following procedure will be followed:

1. Each of the projects will be diagnosed using the specific model (called a “cockpit”) chosen by the project manager.
2. These diagnoses will be analysed during a workshop (interpretative forum) with the project managers. The outcomes of this analysis will be recorded.
3. In the second part of the workshop project managers will be asked to select and describe the actions they will take, using their own “cockpits”. To facilitate this choice process a structured procedure for collegial exchange of experience will be used. The results of this decision making step will be recorded.

This procedure will be repeated between six and twelve times. The length of the period between these workshops depends on the average duration of the projects involved. For ICT projects this is probably one month, for complex building and construction projects it will be about two months.

In the second and subsequent workshops the actions taken by the project managers as well as their perceived effects will also be taken into account in the analysis. Project managers will also be asked to keep a log of incidents occurring in their projects.

This procedure will allow the researcher to make inferences about learning:

- Changes made by the project manager in his or her “cockpit” will indicate learning from a positivist perspective.
- Data derived from recordings of the exchange sessions and de the log will be used to establish if and when single loop learning and or double loop learning occurs, hence indicating learning from a constructivist perspective.

These inferences can be related to data about performance of the projects as these progress through time. This will allow the researcher to test the main hypothesis, namely that the occurrence of learning is related to project success or failure.

While this design satisfies the requirements specified before, it has some limitations too. The most serious of these, of course, is the extensive involvement of the researcher in determination of what the learning is all about and in the process of learning itself. Hence it will be desirable to design and execute a series of investigations in which this involvement is decreased in a systematic manner.
Literature


