A Learning-Based Approach to Performance Management: Drivers of Learning-Oriented Use of Performance Information

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Abstract
This article adds to the empirical knowledge of drivers of learning-oriented use of performance information, paying special interest to the creation of learning forums. On the basis of survey responses from public managers in Danish municipalities, we analyze learning forums together with already established key factors (support capacity, measurability of tasks, and innovative culture) impacting managers’ use of performance information. Furthermore, we examine whether the relationship between learning forums and public managers’ learning-oriented use of performance information is moderated and/or mediated by support capacity, measurability, and innovative culture. The analyses show that both the existence of learning forums and having adequate support capacity are significant and positively related to managers’ learning-oriented use of performance information. It also shows that support capacity significantly and positively mediates the effect of learning forums on managers’ learning-oriented information use. The analyses show no significant moderations. The article contributes to the discussion of learning forums and managers’ information use by connecting learning forums directly to managers’ learning-oriented use of performance information by comparing the effect of learning forums relative to effects of other established important drivers of information use and by advancing the understanding of possible moderating and mediating mechanisms between learning forums and the managers’ learning oriented use of performance information.
Introduction

Over the past three decades, performance measurement practices have been adopted in almost all aspects of contemporary governance (Kroll, 2015; Moynihan, 2008; Moynihan & Pandey, 2010; Moynihan, Pandey, & Wright, 2012, p. 141; Pollitt & Bouckaert, 2011; Radin, 2006), and they have become important and unavoidable elements in every public organization. While performance management would appear to be here to stay (Moynihan & Pandey, 2010), several studies have recently criticized performance management regimes and performance measurement practices in public organizations for not achieving their intended effects (Bischoff & Blaeschke, 2016; Gerrish, 2016; Hood & Dixon, 2015; Jakobsen, Baekgaard, Moynihan, & van Loon, 2017; Pollitt, 2013). Most research argues that an underlying premise for performance management systems to be successful is that public managers use performance information to learn and to develop their organization (Kroll, 2015, p. 460; Moynihan, 2005, p. 203; Moynihan & Landuyt, 2009; Van Dooren & Van de Walle, 2008). Problems in performance management systems often appear when there is a gap between the collection and dissemination of data versus the use of data (e.g., Moynihan 2005; Van Dooren, Bouckaert, & Halligan, 2010). While most systems are excellent at collecting and disseminating data, they often struggle to use it to learn and develop their organizations (Moynihan, 2005, p. 205). An important question therefore becomes which factors support public managers in the learning-oriented use of performance information.

Moynihan (2005, p. 205) points out that the gap between disseminating and using data often occurs “because of an absence of routines in which data are examined and interpreted.” An overall term for such routines is “learning forums.” If managers implement performance management systems without establishing learning forums whereby employees and managers can engage in dialogue about the data and consider its significance, they might be unable to determine why success or failure occurs and are therefore unable to learn from the gathered performance data (Moynihan, 2005). Thus, managers must take learning forums very seriously when implementing performance management in their organizations, as they are a fundamental premise for using performance information. On that background, this article adds to the empirical knowledge of the drivers of managers’ learning-oriented use of performance information by paying special attention to the role of learning forums.

Even though learning forums have been identified as one of the most promising factors in a systematic review of the literature on public managers’ use of performance data (Kroll, 2015), learning forums have not yet been sufficiently examined (Kroll, 2015, p. 473). Only three studies (Moynihan, 2005; Moynihan & Landuyt, 2009; Moynihan & Lavertu, 2012) have thus far examined the importance of learning forums. They all find that these forums are a highly influential variable on organizational learning (Moynihan, 2005; Moynihan & Landuyt, 2009, p. 1100) and how managers use information (Moynihan & Lavertu, 2012). Yet all of the studies call for more research on learning forums (Moynihan, 2005; Moynihan & Landuyt, 2009, p.
Thus, as Kroll points out, we are still in need of corroborating evidence of the relationship between learning forums and information use (Kroll, 2015, p. 473). Our first research question in this article is, therefore:

Do learning forums significantly correlate with public managers' learning-oriented use of performance information when considered together with well-known drivers of performance use?

To rigorously test the relationship between learning forums and the learning-oriented use of performance information among managers, we compare the relative importance of learning forums to the impact of already established key factors (support capacity, measurability of tasks, and innovative culture) behind their use of performance information. These factors were identified by Kroll (2015) in his systematic review of important drivers of data use, which have shown significant, positive effects in several studies. We analyze learning forums together with these factors to see if the relationship remains significant when such well-known factors are taken into account. Furthermore, Kroll argues that more research is needed on the contingency and indirect effects on managers' information use (Kroll, 2015, p. 477). To scrutinize this, our second research question becomes:

Is the relationship between learning forums and public managers' learning-oriented use of performance information moderated and/or mediated by support capacity, measurability, and innovative culture?

To answer our research questions, we analyze data from a survey sent to 1151 public managers in Danish municipalities (response rate 40.3%, N = 464). We use a normal OLS regression to test the direct and moderating effects of learning forums, support capacity, measurability, and innovative culture on public managers' self-reported learning-oriented use of performance information. To examine the mediating effects, we use conditional process analyses (Hayes, 2013). The analyses show that the existence of learning forums and having adequate support capacity are both significant and positively related to managers' learning-oriented use of performance information. Moreover, it shows that support capacity significant and positively mediates the effect of learning forums on managers' learning-oriented information use.

Thus, the article contributes in several ways to the discussion of learning forums and how managers use information. First, it strengthens the arguments concerning the importance of learning forums by connecting them directly to managers' learning-oriented use of performance information. To our knowledge, only one existing study has empirically analyzed the relationship between learning forums and managers' learning-oriented use of information (Moynihan & Lavertu, 2012). Second, we compare the effect of learning forums relative to effects of other important established drivers of information use,
thereby corroborating the findings in the previous literature that lead us to conclude that learning forums are not only a promising factor (Kroll, 2015, p. 473) but should actually be considered a highly important driver affecting how managers use performance information. Finally, we contribute by advancing the understanding of how learning forums may enhance managers’ performance information use. With an in-depth examination of possible moderating and mediating mechanisms, we consider the possibility of a more complex causal pathway between learning forums and managers’ learning-oriented use of performance information (Kroll, 2015, p. 481). We test if learning forums are contingent on or work through both structural and cultural dimensions in the organization, as suggested by Moynihan and Landuyt (2009, p. 1103), and we thereby try to provide a better empirical understanding of how different important drivers may intertwine to shape managers’ behavior (Moynihan, 2005). In so doing, we also answer Kroll’s call for future research in the area—to examine the interplay of several variables in order to be able to grasp the complex social phenomenon that is managers’ use of performance information (Kroll, 2015, p. 478).

The article is structured in five sections. The following section provides a review of the literature and outlines the hypotheses. Section 3 presents the research design, data, and methods. Section 4 presents the results of the analysis, and section 5 discusses the theoretical and practical implications of the results, draws conclusions, and assesses the limitations of our study.

Managers’ use of performance information and the role of learning forums

Performance management systems manage on the basis of the results of public organizations (Hatry, 2006; Kroll, 2015; Pollitt & Bouckaert, 2011), focusing on information about public service outputs and outcomes together with efficiency (a ratio of outputs and inputs) and effectiveness (a ratio of outcomes and outputs) (Kroll, 2015; Moynihan & Landuyt, 2009). Performance information is quantitative and presented in an aggregated format, and it should be systematically derived from a systematic process whereby 1) a measurement object is defined, 2) indicators are selected, 3) data is collected, 4) analyzed, and 5) reported to relevant decision-makers, where it is supposed to 6) be used for future decision-making (Van Dooren, Bouckaert, & Halligan, 2010, p. 25).

Several researchers have argued that a key assumption underpinning performance management system is that the organizational actors should engage in the entire process (by both collecting and using data) to succeed (Kroll, 2015, p. 460; Moynihan, 2005; 2008; Moynihan & Landuyt, 2009). Van Dooren, Bouckaert, and Halligan (2010, p. 30) define performance management as “a type of management that incorporates and uses performance information for decision making.” However, public organizations are often criticized and assessed as being unsuccessful because they fail to use this information (Moynihan & Landuyt, 2009, p. 1097). This causes a gap between the different parts of the process, especially between collecting or disseminating data and using data (Moynihan, 2005, p. 205). If data is not actively used, however, the
intended effects of the management system are unlikely to be realized (Moynihan, 2005; Moynihan & Landuyt, 2009; van Dooren, Bouckaert, & Halligan, 2010). The absence of the use of performance information is therefore problematic and might be a central explanation for many of the unintended consequences of performance management.

The literature discusses a range of different uses of performance information, indicating that it may serve many functions. Moynihan (2009) distinguishes between purposeful, passive, political, and perverse use. However, if the discussion concerns whether performance management succeeds in improving the public sector, we must focus on the purposeful, active use of performance information (Moynihan, 2009). Behn (2003) presents a categorization of eight purposes of using performance information: to evaluate, control, budget, motivate, promote, celebrate, learn, and improve. According to Behn (2003), the first seven purposes are means for achieving improvement. This article focuses on the managers’ learning-oriented use of performance information, since organizational learning is indispensable if managers want to improve and develop their organizations (Moynihan, 2005).

Organizational learning comes from the ability of organizational actors to relate experience and information to routines and problems (Argyris & Schön, 1996, p. 16). We see organizational learning as a processing of information that changes an entity’s range of potential behavior (Huber, 1991) and defines organizational learning as “the development of knowledge held by organizational members, that is being accepted as knowledge and is applicable in organizational activities, therewith implying a (potential) change in those activities” (Berends, Boersma, & Weggeman, 2003, p. 1042). Although many researchers define organizational learning as incorporating only changes that result from a learning process, similarly to Askim, Johnsen, and Christophersen (2008, p. 300), we argue that organizational learning should be viewed more broadly, both as the result of the use of performance information and as a decision to maintain the status quo. Following these definitions, we conceptualize the learning-oriented use of performance information as a processing of performance information that changes an entity’s range of potential behavior, therewith implying a (potential) change in the processes, methods, and approaches for the organizations’ activities.

Drivers behind learning-oriented use of performance information

Much research on the use of performance information has emerged in recent years, usually relying on self-reported survey data (e.g., Askim, Johnsen, & Christophersen, 2008; de Lancer Julnes & Holzer, 2001; Dull, 2009; Johansson & Siverbo, 2009; Melkers & Willoughby, 2005; Moynihan & Hawes, 2012; Moynihan & Ingraham, 2004; Moynihan & Pandey, 2010; Yang & Hsieh, 2007). These studies have increased our knowledge of the factors driving performance information use but have not resulted in an overarching theory (Moynihan & Pandey, 2010, p. 850). Kroll (2015) has, however, provided a systematic literature review of the factors influencing purposeful performance information use. Based on a study of 25 empirical
studies, Kroll distinguishes between important drivers of data use, which have shown significant positive effects in numerous studies, and promising factors requiring more attention in future research (Kroll, 2015). Most of the studies included in Kroll’s systematic literature review examine a broader approach to the purposeful use of performance information rather than learning-oriented use, as we do in this article.

Considering learning-oriented use more specifically, in line with several researchers (Kroll, 2015; Moynihan, 2005; Moynihan & Landuyt, 2009; Moynihan & Lavertu, 2012), we argue that learning forums are a basic premise for learning-oriented use of performance information. However, Kroll only classifies learning forums as a promising factor related to information use due to the sparse empirical evidence supporting the claim. To test whether this claim is actually valid, we will therefore also focus on some of the well-known important factors behind managers’ performance information use that are especially related to learning-oriented use. Based on the existing literature and with special attention to the studies focusing on learning-oriented use (e.g., Askim, Johnsen, & Christophersen, 2008; Moynihan & Landuyt, 2009), we will therefore propose four main hypotheses about the drivers behind managers’ learning-oriented use of performance information. Furthermore, answering Kroll’s call for more research on contingency and indirect effects on how managers use performance information (Kroll, 2015, p. 477), we will scrutinize how the examined drivers might moderate and/or mediate the relationship between learning forums and how managers use learning-oriented information. A moderating effect occurs if the independent variable (X) combines with a third variable (Z) to produce different outputs of the dependent variable (Y) (X × Z → Y1, Y2, Y3); thus, a moderation is when a third variable Z interacts with the relationship between X and Y. The third variable Z is not part of the causal relationship, but it modifies this relationship. However, the moderator may also have an independent impact on the dependent variable (see, e.g., Preacher, Rucker, & Hayes, 2007). In such cases, it is called a quasi-moderator, unlike a real moderator, which does not in itself affect the dependent variable (MacKinnon, 2008, p. 277). A mediating effect is when the independent variable (X) affects the dependent variable (Y) through a third variable (M) (X → M → Y). The independent variable (X) might only affect the dependent variable (Y) if the third variable (M) is present; it is then called a fully mediated relationship. However, the independent variable very often affects the dependent variable both directly and indirectly, which makes it a partly mediated relationship (MacKinnon, 2008).

**Learning forums**

When focusing on learning-oriented use, learning forums stand out as a primary key factor. Moynihan (2005, p. 205) points out how the gap between disseminating and using data often occurs “because of an absence of routines in which data are examined and interpreted.” Such routines may be formally established through learning forums taking a variety of forms. Moynihan (2005, p. 205) defines learning forums as “routines that encourage actors to closely examine information, consider its significance, and decide how it will affect future action.” The purpose of such forums is to create a dialogue concerning
performance information, which is necessary if the organization should be able to learn from the data; “performance data highlight the relative success or failure of a unit or process [...] but only dialogue can help identify and disseminate the reasons why success occurs” (Moynihan, 2005, p. 212). Thus, a learning forum is an organizational mechanism that secures the missing link between data collection and data use in performance management. Learning forums enable organizational actors to identify the reasons why success or failure occurs, thereby enabling them to learn from the gathered performance data and develop the organization in more successful ways (Moynihan, 2005). Learning forums will ideally occur on a regular basis, are based on dialogue between key actors, and are focused on improving the organization. The argument is that in organizations with formal procedures for learning (i.e., learning forums), managers are more effective learners and will therefore use performance information in a more learning-oriented manner than managers in organizations without such forums. We therefore propose that:

H1: Learning forums are positively related to managers’ learning-oriented use of performance information.

Support capacity
The use of performance information is argued to be highly dependent on how the performance management systems are adopted and the support capacity available for performance management practices (e.g., De Lancer Julnes & Holzer, 2001; Moynihan & Hawes, 2012; Yang & Hsieh, 2007). Support capacity for performance management practices can be defined as the resources, capabilities, and technology available to make performance measurement work (Kroll, 2015, p. 472), and can be seen as the extent to which an organization has committed resources (time, training, people, money) for use in performance measurement and management (Kroll, 2015). Support capacity is critical for the learning-oriented use of performance information, since managers need time and must devote resources to the work with performance management, to initiate dialogues, and develop initiatives if they are to learn from the performance information and develop their organizations accordingly. Thus, we hypothesize that:

H2: Support capacity is positively related to managers’ learning-oriented use of performance information.

It is possible to argue that support capacity is both a moderating and mediating variable in the relationship between learning forums and the managers’ learning-oriented use of performance information.

A minimum degree of support capacity may be a premise for establishing learning forums, since they require performance data to be discussed. It is therefore reasonable to expect that the more an organization has invested in support capacity, the more effective its learning forums will function, and in turn they will affect the managers’ learning-oriented use to a higher degree. We propose that:
H2a: Support capacity will positively moderate the relationship between learning forums and managers’ learning-oriented use of performance information.

However, since we already argued for a direct relationship between support capacity and the managers’ learning-oriented use of performance information, support capacity will only be a quasi-moderator (MacKinnon, 2008, p. 277).

It is also reasonable to expect support capacity to mediate the relationship between learning forums and managers’ learning-oriented use of performance information. Learning forums as a structural routine have a positive impact on support capacity, as they are an organizational mechanism that boosts managers’ capabilities to understand and interpret performance information. Learning forums also increase the exchange of experience among the organizational actors, which may support the improvement of the technology to handle the performance information. Learning forums might thereby have an indirect impact on how managers use learning-oriented performance information by increasing the organizations’ support capacity. We therefore also propose that:

H2b: Learning forums will have an indirect effect on managers’ learning-oriented use of performance information through the organizations’ support capacity.

The relationship is expected to be partly mediated.

Measurability of tasks and data quality

Another factor that is expected to affect the learning-oriented use of performance information is the measurability of tasks. In the literature, it is often argued that differences in performance management practices may result from differences in tasks and their measurability. The nature of the tasks determines how easy it is to set up quantitative performance indicators, which are valid measures of the output or outcome of the effort. If the effort is difficult to measure and the quality of the data thereby distorted, it will reduce the relevance of the information for the decision-making process. Therefore, it is pointed out that some organizations have a harder time adopting performance measurement practices and using performance information because their tasks are more difficult to measure (Askim, 2015; de Bruijn 2007; Kristiansen, 2016; 2017; van Dooren, 2005; Wilson, 1989). If some tasks are easier to measure than others, the information derived from such measurement processes will be of better quality and easier to interpret and learn from. The learning-oriented use of performance information thus depends on the validity and quality of data, and measurability may therefore be an important driver behind managers’ learning-oriented use. Consequently, we hypothesize that:
H3: Learning-oriented use of performance information is positively related to the measurability of the organizations’ tasks.

When considering the role of measurability in the relationship between learning forums and how managers use information, learning forums should be expected to function better if the performance results discussed in the forums are easy to measure and the validity and quality of the information is high. The combination of learning forums and good measurability should therefore enhance the managers’ learning-oriented use of information. We therefore expect measurability to be a quasi-moderator:

H3a: Measurability positively moderates the relationship between learning forums and managers’ learning-oriented use of performance information.

Learning forums are organizational routines established to handle performance information. Even though learning forums may help develop better measurement methods, thereby improving the quality of the data, learning forums basically do not alter the nature of the tasks in an organization. They should therefore not be expected to influence the measurability of the tasks. We propose that:

H3b: Measurability does not significantly mediate the relationship between learning forums and managers’ learning-oriented use of performance information.

Innovative culture

Organizational culture has proven to be an important driver of performance information use (Kroll, 2015). An innovative culture “embrace[s] openness to change and values learning from mistakes” (Kroll, 2015, p. 472), which may also be the case when it comes to the learning-oriented use of performance information. Such cultural norms require that managers develop their organizations, making the search for and use of performance information natural management behavior. Having an organizational culture that is supportive of the learning-oriented use of performance information therefore seems to be an important aspect of enhancing managers’ learning-oriented use. As previous research has defined culture too narrowly in terms of its orientation toward performance information systems, Moynihan and Pandey (2010) encourage research examining the relation between the use of performance information and broader cultural concepts. We therefore apply a broad cultural concept, arguing that if managers are situated in an environment that rewards innovation and allows them to question existing routines, they are more likely to use performance data in a learning-oriented way. Conversely, if they are in an environment emphasizing procedural continuity and warning against risk-taking, they may not use performance data to the same extent (Henri, 2006; Moynihan & Pandey, 2010; Quinn & Rohrbaugh, 1981). We hypothesize that:
H4: An innovative culture correlates positively with managers’ learning-oriented use of performance information.

We also expect an innovative culture to moderate the relationship between learning forums and the managers’ learning-oriented use of performance information. Moynihan and Landuyt (2009) argue that establishing a learning forum will only have a positive effect if the appropriate cultural traits are in place. If learning forums are established in a culture that is purpose-driven, encourages the open sharing of information, supports the presentation of different perspectives, and examines errors to solve problems rather than to allocate blame, then the learning-oriented use of performance information is enabled (Moynihan, 2005). Should such a culture not exist, the dissemination of performance information may lead to defensive reactions rather than organizational learning, and learning forums will have no effect. Moreover, the more the organizational culture is characterized by innovative norms, the more managers might be expected to value learning forums in which dialogue about developing the organization takes place. This may increase the time and effort managers’ use on learning forums, thereby strengthening the impact on their learning-oriented use. We suggest that innovative culture is functioning as a quasi-moderator:

H4a: An innovative culture positively moderates the relationship between learning forums and managers’ learning-oriented use of performance information.

However, Moynihan and Landuyt also suggest that learning forums work through the structural and cultural dimensions in the organization (Moynihan & Landuyt, 2009, p. 1103). They emphasize how learning forums integrate both cultural and structural approaches to learning and that these approaches intertwine to form expectations in the organization. In this way, learning forums may affect the degree of innovative culture in the organization, thereby indirectly impacting the managers’ learning-oriented use. Following these arguments, our final hypothesis suggests a partly mediated relationship:

H4b: Learning forums will have an indirect effect on managers’ learning-oriented use of performance information through the organizations’ innovative culture.

Research Design and Methods
The study is based on survey responses from (level 3) public managers in Danish municipalities. Level-3 managers in Danish municipalities refer directly to the top management. The survey was sent to 1151 public managers in Danish municipalities in April 2015 (and followed up by two reminders). 464 respondents completed the survey (40.3% response rate, 44.4% female).
Below we describe the measurement of our main variables (additional detail on the survey items and indexes are presented in Appendix A).

**Learning-oriented use of performance information**

Focusing on the managers’ use of performance information, we examine their estimates of their own use as opposed to individual perceptions of wider group use. We measure the managers’ learning-oriented use of performance information using an index consisting of two questions inspired by Moynihan and Landuy (2009, p. 1105) and Moynihan and Lavertu (2012):

Within the last year, how much have you used performance information:
- to adjust professional methods, approaches, and perspectives for the activities in your entity?
- to adjust internal processes and professional work systems?

The survey items were based on a Likert scale from 1–5. The index had a Cronbach’s alpha of 0.878.

**Learning forums**

Following the arguments made by Moynihan and Lavertu (2012) and Moynihan (2005, p. 211) about learning forums, we measure learning forums using an index based on the following four questions:
- How often do you discuss the results of your entity’s efforts with your entity?
- How often do you discuss the results of your entity’s results with the managing directors?
To what extent has one or several of the employees in your entity participated in:
- network or partnership meetings between municipalities in which you focused on performance management?
- internal meetings focusing on performance management in our entity or across entities within the municipality?

The survey items were based on a Likert scale from 1–5. The index had a Cronbach’s alpha of 0.644.

**Support capacity**

Following Kroll’s (2015, p. 471) discussion of different dimensions of support capacity in the previous literature, we have developed an index to measure support capacity based on the questions below:

To what extent do you think your entity is sufficiently supported to collect, analyze, and distribute the results of your entity’s efforts related to:
- Financial resources (work hours devoted to performance management)?
- Human resources (employees with the knowledge and skills for the work with performance
management)?
- IT and technological resources?
The survey items were based on a Likert scale from 1–5. The index had a Cronbach’s alpha of 0.778.

**Measurability of tasks**

- Our indicators are measurable.
- There is a clear connection between the objective and the indicators in the performance management system.
- It is difficult to find countable measures that cover the results of our primary tasks.
- It is difficult to identify whether the results of our entity are produced by our activities or by other external factors.
- We miss relevant performance indicators for obtaining a more accurate sense of our objectives.

The survey items were based on a Likert scale from 1–5. The index had a Cronbach’s alpha of 0.678.

**Innovative culture**

Based on the discussions of innovative culture by Moynihan, Pandey, and Wright (2012, p. 18), Moynihan and Pandey (2010), and Kroll (2015), we measure innovative culture using the following index:
- Our entity is dynamic and entrepreneurial. The employees are willing to take chances and make mistakes in their work.
- Our commitment to work innovatively and create new solutions ties our entity together.

The survey items (inspired) were based on a Likert scale from 1–5. The index had a Cronbach’s alpha of 0.792.

**Controls**

There is evidence that political support and top-level management involvement and support for performance measurement practices foster performance information use. This type of support signals to mid-level managers that performance management practices are taken seriously in their organization and that it is necessary for them to make the effort to participate and devote their scarce resources accordingly (Kroll,
Similarly, a unified organizational culture is important for the learning-oriented use of performance information. A unified culture provides the organizational members with a common understanding of the mission and norms, which helps them understand the broader system of which they are a part, to place their actions in this broader context, and to learn in a manner that contributes to the whole (Moynihan & Hawes, 2012). Finally, experience with performance management practices may also foster the use of performance information and especially learning-oriented use of performance information. The longer you have worked with performance management, the more you may have learned how to design and use the system in a more sophisticated manner, and the more the system has become institutionalized as a natural part of the organization (Selznick, 1957). We include these variables as controls in our model to ensure that our model is properly specified.

Strategy for the analyses
A four-step multiple linear regression model (OLS) was used to test whether learning forums, support capacity, measurability, innovative culture, and the controls have an impact on the managers’ learning-oriented use of information. Prior to our analyses, we tested the data for violations of the key assumptions behind the regressions. The relations were found to be adequately linear. In addition, all of the measures were analyzed for outliers, and we tested for multicollinearity and heteroscedasticity, finding no problems in this regard. VIF scores were generally low (between 1.042–1.526). Missing data was excluded from the analyses. Many respondents did not answer all of the survey questions, so we carefully examined all of the indexes to see if there were any systematic imbalances in how the missing answer(s) were divided. This was not the case. All of the variables were mean-centered before entering the analyses.

To test for mediating relationships, we used conditional process analyses (Hayes, 2013). Conditional process analyses build on a regression approach using the bootstrap method. There are several different possible analytical methods to test process models with mediating effects. The most commonly used method is “the causal step analysis” (Baron & Kenny, 1986), because it is simple. However, this method has several significant limitations. Most importantly, the “causal step” approach does not provide a precise estimate of the mediating effect (Hayes, 2009; see also MacKinnon, 2008, pp. 342ff; Preacher, Rucker, & Hayes, 2007, p. 189). While other tests (e.g., Sobel’s test) are based on assumptions that the mediating variable is normally distributed, research has shown that this is often not the case (Hayes, 2009). Instead, standard errors are very often biased in mediation analyses, increasing the risk of committing a type-1 error (MacKinnon, Fairchild, & Fritz, 2007, p. 601). The bootstrap method is advantageous in that it does not rely on these assumptions of normally distributed standard errors. It is based on a re-sampling of the original data population, thereby generating an empirical representation of the distribution of the mediating effects. Hence, the bootstrap analysis provides the most accurate estimates of the mediation effect (Hayes, 2009; MacKinnon, 2008; MacKinnon et al., 2007). MacKinnon also points out that the bootstrap method is
especially advantageous if you want to test models containing more than one mediating variable, as is the case in the following analysis (MacKinnon, 2008, p. 344). It has been chosen to work with 10,000 re-samples as the basis for the analysis in this article.

**Results**

The descriptive statistics and correlations for the study variables are shown in Table 1 to highlight the pattern of relationships between the different antecedents of performance information use and the outcome variable: the managers’ learning-oriented use of performance information.

Table 1 illustrates the significant correlations between the dependent and key independent variables (learning forums, support capacity, measurability of tasks, and innovative culture). The direction of these relationships was as expected. While these results lend support to our theoretical expectations, we undertook a multiple regression to determine whether our hypotheses are supported. We estimated four models: Model 1 enters the controls; model 2 focuses on the impact of learning forums on the managers’ learning-oriented use of performance information; model 3 adds support capacity, measurability of tasks, and a measure for innovative culture in the organization; and the interactions are entered in model 4. In the models, we report both the unstandardized coefficients and model the standardized coefficients.

The results are presented in Table 2. When studying model 1, we see that two of the controls—the degree of top-level management attention and support (p ≤ 0.05) and experience with performance measurement in the organization (p ≤ 0.10)—are related to the managers’ learning-oriented use of performance information. The impact of the degree of top-level management attention and support disappears, however, when learning forums are introduced in the analyses. Model 2 shows that, as expected in Hypothesis 1, learning forums are positive and highly significant correlated (p ≤ 0.01) with the managers’ learning-oriented use of performance information. This positive and significant relationship is stable in model 3, when support capacity, measurability, and innovative culture are entered into the regression. As expected in Hypothesis 2, support capacity is positively and significantly correlated (p ≤ 0.01) to the learning-oriented use of performance information. No significant relationship is found regarding the measurability of tasks and innovative culture, and Hypotheses 3 and 4 are therefore not supported in this dataset. Together, the variables in model 3 only explain 16.7% of the variance in the index for learning-oriented use of performance information, which indicates that other factors are also important for managers’ learning-oriented use of performance information (King, 1986). Finally, none of the interaction
effects were significant in model 4, leading us to reject Hypotheses 2a, 3a, and 4a.

To determine whether the relationship between learning forums and managers' learning-oriented use of performance information are mediated by support capacity, measurability, and innovative culture, we also conducted a mediation analysis. Table 3 displays the analysis and shows that the overall model is highly significant, the total effect being 0.279. As in the multiple regression analysis, learning forums have a significant and positive direct effect on the learning-oriented use of performance information (in this model, the direct effect is 0.221***). The specific causal pathways on the right side of the models show us that learning forums are significant and positively related to support capacity and innovative culture, but not significantly related to measurability. Thus far, the results support our theoretical propositions. However, even though support capacity is highly significant and positively related to the learning-oriented use of performance information (the left side of the model), measurability and innovative culture are not significantly related to the learning-oriented use of performance information. This means that only support capacity has a mediating effect on the relationship between learning forums and the managers' learning-oriented use of performance information (as displayed by the two positive bootstrap results in the box in the middle of the model). Support capacity positively mediates the relationship, meaning that the effect of learning forums on the learning-oriented use of performance information is strengthened the higher the degree of support capacity in the organization. Thus, Hypothesis 2b is supported by the data, as is Hypothesis 3b (which expected no significant mediation effect between learning forums, the measurability of tasks, and managers' learning-oriented use). Hypothesis 4b was rejected based on this data, however, which showed a significant correlation between learning forums and innovative culture but no indirect effect of learning forums on the managers' learning-oriented use through innovative culture. However, the results from our mediation analyses still indicate that several of the independent factors in our first analysis (the multiple regression analysis) are correlated in different ways; hence, that it is reasonable to consider the more complicated causal mechanisms between learning forums, support capacity, measurability, innovative culture, and learning-oriented use of performance information. These findings are discussed further in the next section.

Discussion and Conclusions

This article focuses not only on the use of performance information but more specifically on public managers' learning-oriented use of performance information. We do so because a learning-oriented use of performance information is necessary if performance management systems are to succeed in public organizations (Moynihan, 2009). Similarly to Jakobsen, Baekgaard, Moynihan, & van Loon (2017), we argue that the design and adoption of a more learning-oriented approach to performance management that involves professionals in the development and interpretation of performance information may be a means to overcome some of the unintended consequences related to traditional external or accountability-
oriented performance management systems. The learning-oriented use of performance information may help develop the organization by improving the decision-making and thereby ultimately improving public performance (Moynihan, 2008, p. 7). Increased the learning-oriented use of performance information among public managers and employees may also prevent some of the unintended effects of performance management by reducing the sense of disempowerment and increased external control (Jakobsen, Baekgaard, Moynihan, & van Loon, 2017), by hindering the crowding out of public employees and reducing public service motivation (Andersen & Pedersen, 2016; Frey & Jegen, 2001), and by reducing the perverse use of performance information, such as goal displacement, tunnel vision, and gaming (Bevan & Hood, 2006; Hood, 2006; Smith, 1995). We hope that this article paves the way for better understanding of which mechanisms public managers should pay special attention to in order to strengthen their learning-oriented use of the relevant performance information in the organization. A highly promising factor in this regard is the use of learning forums. However, even though the literature points to learning forums as a key organizational mechanism for improving the learning-oriented use, we still need more knowledge of how learning forums may support managers’ learning-oriented use of performance information (Kroll, 2015). The purpose of this article was therefore to add to the empirical knowledge concerning the factors driving the learning-oriented use of performance information, with special attention to learning forums as a key antecedent.

Similar to Moynihan and Landuyt (2009), our findings show that organizational routines for examining and discussing information and considering its consequences for subsequent action through the creation of learning forums are positively related to the learning-oriented use of performance information. Learning forums thus seem to enable managers’ learning-oriented use of performance information. Further, in line with Berman and Wang (2000), de Lancer Julnes and Holzer (2001), Moynihan and Hawes (2012), and Yang and Hsieh (2007), we found that support capacity was positively related to the managers’ learning-oriented use of performance information. Thus, adequate resources, capabilities, and the technology for making performance management work seem to enable learning-oriented use of performance information.

Creating learning forums and providing the support capacity necessary to make performance management work are the only two variables that were positively and significantly related to the learning-oriented use of performance information. Although the descriptive statistics indicated several significant correlations in the expected direction between the dependent and independent variables, most of these correlations disappeared in the multiple regressions. Thus, contrary to previous studies by Johansson and Siverbo (2009), Moynihan and Pandey (2010), and Moynihan, Pandey, and Wright (2012), we did not find a significant relationship between an innovative culture that embraces openness to change and values learning from mistakes and managers’ learning-oriented use of performance information. Surprisingly, the analyses did not find a significant relation between the measurability of tasks and managers’ learning-
oriented use of performance information. This may indicate that, together with support capacity, learning forums outweigh the explanatory power of such variables when considered together in the same model. Thus, this finding corroborates the theoretical arguments about the importance of establishing learning forums in public organizations working with performance management systems (Moynihan, 2005; Moynihan & Landuyt, 2009). It also leads us to conclude that learning forums and support capacity claim superiority when public managers work with and strengthen the learning-oriented use of performance information in their organizations. Therefore, learning forums may not only be seen as a promising factor (Kroll, 2015, p. 473) in future research but should be considered a highly important driver behind managers’ use of learning-oriented performance information.

Furthermore, in his meta-study, Kroll (2015) argued that more evidence was generally required regarding the complex causal pathways between different antecedents and the use of performance information. To advance the understanding of how learning forums possibly affect public managers’ learning-oriented use of performance information, we also scrutinized how learning forums intertwined with some of the most well-established antecedents in the literature behind a learning-oriented use. We therefore examined whether the effect of learning forums was positively moderated and/or mediated by support capacity, the measurability of the tasks, and the innovative culture in the organization. The analyses showed no significant moderations. Thus, parallel to our conclusion above, it seems as though having created learning forums for examining and discussing information in itself is an important element in enabling learning-oriented use and that the effect of learning forums is not contingent on other organizational or cultural factors. However, the mediation analysis showed that the relationship between learning forums and learning-oriented use of performance information was significant and positively mediated by the degree of support capacity in the organization. This indicates that besides being an important antecedent in itself, learning forums also indirectly affect the learning-oriented use of performance information among managers, in this case by strengthening the organizations’ support capacity. While learning forums also seemed to strengthen the innovative culture in the organizations, no mediating effect of innovative culture was found between learning forums and the managers’ learning-oriented use. However, Moynihan and Landuyt (2009) argue that it is important to recognize both structural and cultural dimensions as broad and connected norms in an organization, which together shape behavior (Moynihan & Landuyt, 2009, p. 1102). Future research should therefore scrutinize how learning forums are entangled with the organizational culture and other important structural factors. It would be especially helpful with more case studies that could pinpoint the details in the complex relationships and longitudinal studies that could determine the causality in these relationships.

Like all research, our analyses also have limitations that should be addressed. As with most of the previous studies on the use of performance information, we rely on self-reported indicators. The survey approach
allows us to come closer to an understanding of which factors are associated with public managers’ perceptions of whether they use performance information in a learning-oriented manner. The survey approach has limitations, however, particularly in terms of the potential for an upward response bias (Fleenor et al., 2010). It can also be difficult to capture many of the processes related to the learning-oriented use of performance information when using a cross-sectional survey design like ours. Here, more qualitative designs are needed. Problems of endogeneity cannot be ruled out, either. We can therefore only speak of associations or relationships—not causal effects. Another limitation relates to the fact that all of our measures come from the same source, which creates risk of problems with common method bias (Favero & Bullock, 2015; George & Pandey, 2017; Meier & O’Toole, 2013). A survey-based approach may be required when testing such relationships, however, capturing a large number of comparable individual responses across organizational settings on items that are difficult to observe externally (e.g., organizational culture and public managers’ learning-oriented use of performance information). Moreover, common method bias is argued to be less problematic regarding interaction effects, since common method variance has been shown not to inflate interaction effects (Jacobsen & Jensen, 2015). Finally, this study points to broader implications, but it is important to be aware that the data used reflects a particular Danish setting. This might have an impact on possible relevant factors, such as the culture of the public organizations, the authoritative relationship between managers and employees, and so forth. The specific results should therefore only be directly generalized to other countries with great caution. To expand further on our understanding of how learning forums affect public managers’ use of performance information, it would be interesting to compare the results from this study to similar studies in other countries.

Despite these limitations, the findings still have important practical implications for public managers. If learning forums and support capacity claim superiority over other antecedents to learning-oriented use, they become very important to be aware of when public managers shall work with and strengthen the performance management systems in their organizations. First, public managers may benefit from establishing formal procedures centered within learning forums in the organization. Such procedures should secure that performance information is examined, discussed, and subsequent action is considered. The learning forums may be organized among managers across departments and organizations, but they might also be implemented as minor day-to-day dialogues involving managers and employees within a specific department. The managers should also pay attention to which communication channels should be used to disseminate information from the learning forums to the relevant actors in the organization, and they might specify more standardized plans for how to implement the knowledge obtained in daily practice. Second, public managers should invest in developing support capacity by training employees, devoting resources to the work with performance management and providing sufficient technological support. Our results suggest that establishing learning forums increases the support capacity, but future studies should look into which organizational factors and management tools can be used to strengthen the
support capacity and learning forums. Performance management is often criticized for not being appropriate for public sector tasks or the certain characteristics of the public sector (e.g., Radin, 2006), but our study indicates that public managers can do several things to enable the learning-oriented use of performance information. A positive message in this regard is that the most important drivers of the learning-oriented use of performance information seem to be factors (learning forums and support capacity) that public managers are actually able to affect.
## Appendix A: Variables and Survey Items

<table>
<thead>
<tr>
<th>Variables</th>
<th>Survey items</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent</strong></td>
<td></td>
</tr>
<tr>
<td>Learning-oriented use of performance information</td>
<td>Within the past year, to what extent have you used performance information:</td>
</tr>
<tr>
<td>Cronbach’s alpha: 0.909</td>
<td></td>
</tr>
<tr>
<td>- To adjust professional methods, approaches, and perspectives for the activities in our entity.</td>
<td></td>
</tr>
<tr>
<td>- To adjust internal processes and professional work systems? (1 = not at all, 2 = to a minor degree, 3 = to some degree, 4 = to a large degree, 5 = to a very large degree).</td>
<td></td>
</tr>
<tr>
<td><strong>Independent</strong></td>
<td></td>
</tr>
<tr>
<td>Learning forums</td>
<td>- How often do you discuss the results of your entity’s efforts with your entity? 1 = never, 2 = seldom (once or twice per year), 3 = once in a while (once every three months), 4 = Often (once a month), 5 = very often (once a week or more often).</td>
</tr>
<tr>
<td>Cronbach’s alpha: 0.644</td>
<td>- How often do you discuss the results of your entity’s results with the managing directors? 1 = never, 2 = seldom (once or twice per year), 3 = once in a while (once every three months), 4 = Often (once a month), 5 = very often (once a week or more often).</td>
</tr>
<tr>
<td></td>
<td>To what extent has one or several of the employees in your entity participated in:</td>
</tr>
<tr>
<td></td>
<td>- Network or partnership meetings between municipalities in which you focused on performance management.</td>
</tr>
<tr>
<td></td>
<td>- In-house meetings focused on performance management in your entity or across entities within the municipality (1 = not at all, 2 = to a minor degree, 3 = to some degree, 4 = to a large degree, 5 = to a very large degree).</td>
</tr>
<tr>
<td>Support capacity</td>
<td>To what extent do you think your entity is sufficiently supported in order to collect, analyze, and distribute the results of your entity’s efforts related to:</td>
</tr>
<tr>
<td>Cronbach’s alpha 0.778</td>
<td>- Financial resources (work hours devoted to performance management)?</td>
</tr>
<tr>
<td></td>
<td>- Human resources (employees with the knowledge and skills to work with performance management)?</td>
</tr>
<tr>
<td></td>
<td>- IT and technological resources (1 = not at all, 2 = to a minor degree, 3 = to some degree, 4 = to a large degree, 5 = to a very large degree).</td>
</tr>
<tr>
<td>Measurability of tasks</td>
<td>- Our indicators are measurable (1 = to a very low degree, 2 = to a minor degree, 3 = to some degree, 4 = to a large degree, 5 = to a very large degree).</td>
</tr>
<tr>
<td>Cronbach’s alpha: 0.678</td>
<td>- There is a clear connection between the objective and the indicators in the performance management system (1 = to a very low degree, 2 = to a minor degree, 3 = to some degree, 4 = to a large degree, 5 = to a very large degree).</td>
</tr>
<tr>
<td></td>
<td>- It is difficult to find countable measures that cover the results of our primary tasks (5 = not at all, 4 = to a minor degree, 3 = to some degree, 2 = to a large degree, 1 = to a very large degree) (reversed).</td>
</tr>
<tr>
<td></td>
<td>- It is difficult to determine whether our entity’s results are caused by our activities or by other external factors (5 = not at all, 4 = to a minor degree, 3 = to some degree, 2 = to a large degree, 1 = to a very large degree) (reversed).</td>
</tr>
<tr>
<td></td>
<td>- We miss relevant performance indicators to get a more accurate picture of our objectives (5 = to a very low degree, 4 = to a minor degree, 3 = to some degree, 2 = to a large degree, 1 = to a very large degree) (reversed).</td>
</tr>
<tr>
<td>Innovative culture</td>
<td>- Our entity is dynamic and entrepreneurial. The employees are willing to take chances and make mistakes in their work (1 = not at all, 2 = to a minor degree, 3 = to some degree, 4 = to a large degree, 5 = to a very large degree).</td>
</tr>
<tr>
<td>--------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Cronbach’s alpha</td>
<td>0.792</td>
</tr>
<tr>
<td></td>
<td>- It is our commitment to work innovatively and create new solutions that tie our entity together (1 = not at all, 2 = to a minor degree, 3 = to some degree, 4 = to a large degree, 5 = to a very large degree).</td>
</tr>
<tr>
<td>Control</td>
<td></td>
</tr>
<tr>
<td>Political support and involvement</td>
<td>- There is a political interest in information about our entity’s performance (1 = not at all, 2 = to a minor degree, 3 = to some degree, 4 = to a large degree, 5 = to a very large degree).</td>
</tr>
<tr>
<td>Cronbach’s alpha</td>
<td>0.799</td>
</tr>
<tr>
<td></td>
<td>- The politicians are involved in defining our entity’s performance objectives (1 = not at all, 2 = to a minor degree, 3 = to some degree, 4 = to a large degree, 5 = to a very large degree).</td>
</tr>
<tr>
<td>Top-level management attention and support</td>
<td>- Top-level management gives performance management managerial attention (1 = not at all, 2 = to a minor degree, 3 = to some degree, 4 = to a large degree, 5 = to a very large degree).</td>
</tr>
<tr>
<td>Cronbach’s alpha</td>
<td>0.905</td>
</tr>
<tr>
<td></td>
<td>- Top-level management promotes working with performance management (1 = not at all, 2 = to a minor degree, 3 = to some degree, 4 = to a large degree, 5 = to a very large degree).</td>
</tr>
<tr>
<td>Unified culture</td>
<td>- Our entity is characterized by a shared professional understanding and traditions shared by employees and managers (1 = not at all, 2 = to a minor degree, 3 = to some degree, 4 = to a large degree, 5 = to a very large degree).</td>
</tr>
<tr>
<td>Cronbach’s alpha</td>
<td>0.634</td>
</tr>
<tr>
<td></td>
<td>- We seldom experience disagreements about professional methods and processes in our entity (1 = not at all, 2 = to a minor degree, 3 = to some degree, 4 = to a large degree, 5 = to a very large degree).</td>
</tr>
<tr>
<td>Performance measurement experience</td>
<td>- How many years have you had a systematic performance management practice in your entity? (1 = 0 years, 2 = 1–2 years, 3 = 3–4 years, 4 = 5–6 years, 5 = &gt; 6 years).</td>
</tr>
<tr>
<td>Respondents can also choose “don’t know.” Such responses are excluded from the scale. All indexes are converted to a 1–5 scale.</td>
<td></td>
</tr>
</tbody>
</table>
References


<table>
<thead>
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</tr>
</thead>
<tbody>
<tr>
<td>Learning oriented Use of Information</td>
<td>3.373</td>
<td>0.965</td>
<td>(0.878)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Learning Forums</td>
<td>3.047</td>
<td>0.729</td>
<td>0.435**</td>
<td>(0.644)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Support capacity</td>
<td>3.024</td>
<td>0.802</td>
<td>0.295**</td>
<td>0.303**</td>
<td>(0.778)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measurability of tasks</td>
<td>3.529</td>
<td>0.563</td>
<td>0.247**</td>
<td>0.160**</td>
<td>0.381**</td>
<td>(0.678)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Innovative culture</td>
<td>3.363</td>
<td>0.814</td>
<td>0.198**</td>
<td>0.219**</td>
<td>0.126**</td>
<td>0.013</td>
<td>(0.792)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Unified culture</td>
<td>3.015</td>
<td>1.053</td>
<td>0.365**</td>
<td>0.318**</td>
<td>0.184**</td>
<td>0.121*</td>
<td>0.138**</td>
<td>(0.634)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Top-level management attention and support</td>
<td>3.435</td>
<td>1.053</td>
<td>0.346**</td>
<td>0.390**</td>
<td>0.327**</td>
<td>0.188**</td>
<td>0.135**</td>
<td>0.545**</td>
<td>(0.905)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Political support and involvement</td>
<td>3.564</td>
<td>0.656</td>
<td>0.005</td>
<td>0.035</td>
<td>0.184**</td>
<td>0.053</td>
<td>0.287**</td>
<td>0.017</td>
<td>0.109*</td>
<td>(0.799)</td>
<td></td>
</tr>
<tr>
<td>Performance measurement experience</td>
<td>2.900</td>
<td>1.387</td>
<td>0.308**</td>
<td>0.205**</td>
<td>0.269**</td>
<td>0.206**</td>
<td>0.090</td>
<td>0.242**</td>
<td>0.255**</td>
<td>0.101*</td>
<td></td>
</tr>
</tbody>
</table>

*p<0.1, **p<0.05, ***p<0.01, (Chronbachs alpha)
## Table 2: Multiple linear regression model (OLS)

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent variable: Learning oriented use of performance information</td>
<td>Beta</td>
<td>Beta</td>
<td>Beta</td>
<td>Beta</td>
</tr>
<tr>
<td>Unified culture</td>
<td>0.114</td>
<td>0.083</td>
<td>0.107</td>
<td>0.078</td>
</tr>
<tr>
<td>Top-level management attention and support</td>
<td>0.111**</td>
<td>0.136**</td>
<td>0.053</td>
<td>0.065</td>
</tr>
<tr>
<td>Political support and involvement</td>
<td>0.090</td>
<td>0.110</td>
<td>0.065</td>
<td>0.079</td>
</tr>
<tr>
<td>Performance measurement experience</td>
<td>0.074*</td>
<td>0.111*</td>
<td>0.068*</td>
<td>0.103*</td>
</tr>
<tr>
<td>Learning forums</td>
<td>0.279***</td>
<td>0.230***</td>
<td>0.221***</td>
<td>0.182***</td>
</tr>
<tr>
<td>Support capacity</td>
<td>0.207***</td>
<td>0.187***</td>
<td>0.196***</td>
<td>0.177***</td>
</tr>
<tr>
<td>Measurability of tasks</td>
<td>0.127</td>
<td>0.088</td>
<td>0.132</td>
<td>0.091</td>
</tr>
<tr>
<td>Innovative culture</td>
<td>0.056</td>
<td>0.053</td>
<td>0.055</td>
<td>0.053</td>
</tr>
<tr>
<td>Learning forums X Support capacity</td>
<td>0.026</td>
<td>0.023</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Learning forums X Measurability of tasks</td>
<td>0.090</td>
<td>0.054</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Learning forums X Innovative culture</td>
<td>-0.008</td>
<td>-0.008</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

n = 301

*p ≤ 0.10, **p ≤ 0.05, *** p ≤ 0.01

| p = 0.000 | p = 0.000 | p = 0.000 | p = 0.000 |
| R² = 0.077 | R² = 0.122 | R² = 0.167 | R² = 0.171 |
| R² change = 0.044*** | R² change = 0.045*** | R² change = 0.004 |
Table 3: Mediation analyses (Learning forums)

<table>
<thead>
<tr>
<th>Learning Forums</th>
<th>Support capacity</th>
<th>Measurability</th>
<th>Innovative Culture</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.162*** SE (0.062)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.062 SE (0.051)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.289*** SE (0.067)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Support capacity

Measurability

Innovative Culture

Learning Forums

Learning-oriented use of performance information

<table>
<thead>
<tr>
<th>Learning Forums</th>
<th>Support capacity</th>
<th>Measurability</th>
<th>Innovative Culture</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.207** SE (0.070)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.127 SE (0.084)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.056 SE (0.061)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Learning Forums

Learning-oriented use of performance information

<table>
<thead>
<tr>
<th>effect</th>
<th>Boot LCI</th>
<th>Boot ULCI</th>
</tr>
</thead>
<tbody>
<tr>
<td>direct</td>
<td>0.221 (0.074)</td>
<td>0.076</td>
</tr>
<tr>
<td>indirect</td>
<td>Support capacity</td>
<td>0.034 (0.020)</td>
</tr>
<tr>
<td>indirect</td>
<td>Measurability</td>
<td>0.008 (0.011)</td>
</tr>
<tr>
<td>indirect</td>
<td>Innovative Culture</td>
<td>0.016 (0.023)</td>
</tr>
</tbody>
</table>

Total model $P = 0.000$
$N = 301$
10,000 re-samples

*p ≤ 0.10, **p ≤ 0.05, ***p ≤ 0.01