

Fostering exploration and exploitation behavior in management teams to enhance organizational performance: the LearnOvation leadership development program

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Abstract

Purpose – The purpose of this paper is to assess the impact and effectiveness of the LearnOvation leadership development program in the welfare services sector in Sweden.

Design/methodology/approach – LearnOvation was based on ambidexterity theory for the program content and the research study design. A mixed-method design was applied, using questionnaires among staff ($n = 523$) and written evaluations with the management teams ($n = 60$).



Findings – Quantitative analysis of the questionnaires indicated little change in managers' and staffs' innovation behaviors, though employee exploration behaviors were strongly and positively correlated with their innovation behaviors. Qualitative leader-written evaluations reported increased understanding of innovation management and the use of exploration and exploitation activities to involve staff in the implementation of creative ideas within the organization.

Practical implications – The authors argue that innovating is about creating a fertile ground for exploration and exploitation processes of learning that support staff's willingness to meet goals, as well as their capability to explore new ideas and experiment in new ways of working. Leadership development activities that engage the entire management team can build the necessary capacity and power to lead innovation processes in highly structured welfare services and free the employees' innovativeness, potentially leading to improved services and employee satisfaction.

Originality/value – With the goal of enhancing the innovation capacity in daily practice, this study adds to the scarcity of research in welfare services on how to actually support management's work on leading successful implementation of creative ideas.

Keywords Leadership development, Innovation, Ambidexterity, Exploration and exploitation behavior, Welfare services

Paper type Research paper

Introduction

Innovation has been identified as imperative for improving the quality, productivity and efficiency of organizational performance (OECD, 2010). The ideas and actions of individual employees are of crucial importance for innovation (Rosing and Zacher, 2017; Van de Ven, 2017), which suggest that leaders can play an important role in creating a supportive context that can help employees attain high innovation performance (Ellström, 2010; Hughes *et al.*, 2018; March, 1991). Van de Ven (2017) suggests that managers can increase their chances of success by developing and practicing skills in learning, leading and maneuvering through the innovation journey. However, few leaders have formal skills in innovation (Osborne and Brown, 2005).

Innovation in welfare organizations is proposed to be particularly challenging, because services are often framed by rigorous safety regulations, which are recognized to hinder the risk-taking behavior often found in innovative environments (Anderson *et al.*, 2014; Brown and Osborne, 2013; Torfing, 2019). Also, resistance to innovation in the public sector tends to come from within the organization (Cinar *et al.*, 2019). However, there is limited knowledge on *how* specific programs should be designed to support management's work on leading innovation, and this paper examines this question of *how*. We suggest the potential for ambidexterity theory to enhance current understandings of leadership development programs and add new perspectives on how to equip managers with skills to lead innovation.

In the following section, the authors discuss ambidexterity theory in relation to leadership and innovation behaviors. A mixed-method approach is then described, including an outline of the setting for this study. The results are presented in both qualitative and quantitative sections. The discussion addresses theoretical contributions and some implications for enhancing the innovation capacity in daily practice. Finally, a conclusion on how to support management's innovation work is offered.

Theoretical framework

Ambidexterity theory of leadership and innovation

The literature on organizational ambidexterity implies that if managers and teams are good at managing both the operational functions of their work (exploitation activities) and development work (exploration activities), organizational performance can improve (Crossan *et al.*, 1999; Gibson and Birkinshaw, 2004; Gupta *et al.*, 2006; March, 1991; Rosing *et al.*, 2011). In an ambidextrous leadership practice, exploration involves increasing the complexity of responses by involving others through activities such as stimulating

group discussion and encouraging boundary spanning, whereas exploitation implies delimiting the complexity by redirecting efforts to deliver management expectations, enforce rules and minimize involvement and discussions (Havermans *et al.*, 2015). Thus, exploration is about leaders' opening behaviors, for example, exploring new ideas, experimenting and taking risks. Exploitation, on the other hand, focuses on leaders' closing behaviors, for example, achieving goals, effectiveness and following guidelines and routines, thereby reducing risks and errors (March, 1991; Rosing *et al.*, 2011). It is claimed that ambidexterity prompts innovation at an organizational level (Gibson and Birkinshaw, 2004), but ambidextrous behavior on a practice-based level is justified because managers and employees need to be both efficient and flexible in catering to the various needs of consumers and stakeholders (Mom *et al.*, 2015).

Current research on ambidexterity leadership and innovation

The actions of individual employees are also of crucial importance for innovation and improvement (Van de Ven, 2017). Previous studies have established that managers' exploration and exploitation behaviors have an impact on employees' exploration and exploitation behaviors (Gerlach *et al.*, 2020; Mom *et al.*, 2007), and employees tend to be more likely to engage in creative activities when leaders provide empowering leadership feedback (Kim *et al.*, 2018). Studies have proposed that employees who have a good balance between exploration and exploitation behaviors are very innovative, even more than when only exploration is high (Rosing and Zacher, 2017; Zacher and Rosing, 2015). However, follow-up research has modified and identified that organizational innovativeness may prosper when specialized in either exploration or exploitation activities/behaviors (Caniëls and Veld, 2016). Consequently, an organization may value having staff who are good at both exploration and exploitation, but also employees who are specialized in either/or, which requires a leader to focus on the quality of interactions and qualitative dialogue among employees.

Researchers have acknowledged the ambidextrous leadership approach to innovation (Anderson *et al.*, 2014; Duc *et al.*, 2020; Rosing *et al.*, 2011; Zacher and Wilden, 2014), but there is more to learn about ambidexterity in subsequent studies (Anderson *et al.*, 2014), particularly with regard to the complexity of innovation processes (Luu *et al.*, 2018). Also, the value of creating a partnership with patients, that is, co-production, is an emerging trend in both research and practice (Bason, 2018; Chen *et al.*, 2015; Kjellström *et al.*, 2019; Torfing, 2019). Bason (2018) argues that the courage to lead innovation at all levels and involve people in the innovation process is essential for future innovation, which involves the need to decentralize power and create collaboration across all levels of the organization, suggesting that collaboration can be valued within an organization, between different professional groups and with external stakeholders.

The aim of this study is to assess the impact and effectiveness of the LearnOvation leadership development program. Two research questions are addressed: (1) What kind of learning occurs with the program? (2) Do staff and leaders' innovation behaviors improve? The intervention that is the keystone of the study was theoretically based on current ambidexterity research and tailor-made to meet the learning needs and resources of the primary health care centers involved (details are provided in a study protocol, (Avby and Kjellström, 2019). Furthermore, the intervention was based on a needs analysis, which has been argued to result in greater learning and transference (Lacerenza *et al.*, 2018). The study contributes to knowledge on *how* to organize processes of innovation and support exploration and exploitation behaviors by co-producing and testing the LearnOvation program. This research is a response to the calls for longitudinal studies on ambidexterity (Alghamdi, 2018; Caniëls and Veld, 2016), as well as the need for longitudinal leadership programs (Vogel *et al.*, 2021).

Methods

Setting

The local setting for this study is primary health care in southern Sweden run by Bräcke diakoni (BD) and Region Jönköping County (RJC). The study focuses on a leadership development program that has its starting point in a framework developed in a previous study on innovation at successful primary health care centers in the region (Avby *et al.*, 2019; Kjellström *et al.*, 2017). Four seminars were held that combined theoretical teachings, practical exercises, reflections and followed exploration and exploitation behaviors (Table A1). The seminars were run by two researchers and two development leaders, who had slightly different roles and responsibilities. The researchers treated the themes as current research and supported meta-reflection, whereas the development leaders contributed with their experience and knowledge of working with systematic quality improvement work in the practice setting. For a full description of the development process and the main themes, see the study protocol (Avby and Kjellström, 2019).

Data collection and ethics

The research process used concurrent data collection and analysis of both qualitative and quantitative data to integrate the results and better provide an answer to the main research question (Ozawa and Pongpirul, 2014) and a deeper understanding of the interaction of variables in a complex setting (Miles and Huberman, 1994).

Through written and oral reflections, the qualitative data were collected from all participants in the program groups, and were collected after learning seminars 1 and 3 and through inter-participant dialogue within each care center after learning seminar 4 (Table 1). The purpose of the written evaluations was to obtain more in-depth insight on the issue. Importantly, the focus in this paper is not on a particular innovation or innovation process but on the innovation performance in daily practices to explore the effects on exploration and exploitation behaviors.

Learning Seminar	Method	Questions
Learning seminar 1	Individual, written evaluation ($n = 14$ / $n = 14$)	<ol style="list-style-type: none"> 1. What do you bring to your work? 2. Something new that you have not thought of before? 3. What do you want more of? 4. What do you want less of?
Learning seminar 3	Individual, written evaluation ($n = 10$ / $n = 15$)	<ol style="list-style-type: none"> 1. What benefit do you have from the program in your work? 2. What benefit do you think your management team has from the program so far? 3. What benefit do you think your health care unit has from the programme? 4. Would you recommend the program to others? Motivate! 5. If you were the program facilitator yourself, what would you do differently?
Learning seminar 4	Dialogue between the participants within the health care units. The research team (GA, AF, CF) made memory notes that were later approved by the participants ($n = 3$ / $n = 3$)	<ol style="list-style-type: none"> 1a. Can you give examples of something that you do differently in everyday work compared with a year ago (which you think depends on the program) 1b. Can you give examples of something that others at your health care centre do differently in everyday work compared with a year ago (which you think depends on the programme) 2. How do you value what happened? How do you interpret what happened? 3. Now then? What needs to be done next to improve the innovation power at our own unit?

Table 1.
Qualitative data
collection

In all participating health care centers, quantitative data were collected through questionnaires. We also asked two health care centers known to be well-functioning and innovative to be part of the control group (see [Table 2](#), primary care units F and J). An informed consent process was performed in two steps: (1) with the managers as they registered for participation, and (2) when the team was admitted to the program. As the questionnaires were distributed, each employee was informed of their rights and had the option to decline participation. The questionnaire was then distributed in paper format at a staff meeting. The staff were asked to fill out the questionnaire individually and then hand in the answers in a closed, pre-addressed envelope. A key person at each center was assigned to organize the distribution, collection and forwarding of the questionnaires to one of the researchers, who coded and registered the results. The procedure has been approved by the Regional Research Ethics Board in Linköping (reg nr 2018-465-31).

The questionnaire was originally planned to be distributed and filled out on three different occasions for the control group and by a cohort of managers and staff (in external well-functioning health care centers), and for the experimental group before the program to provide baseline data, after the program was completed and at a 6-month follow-up. However, the 6-month follow-up was completed only with the first program group. Considering that there were no significant changes between the measurement times, we decided that it was unethical to burden the health care centers with additional questionnaires. The procedure resulted in a sample of 523 participants ([Table 2](#)).

Measures and operationalization

To approach our aim of measuring the progression and impact of leadership in innovation, we used two established exploration and exploitation questionnaires ([Mom et al., 2009](#); [Zacher and Rosing, 2015](#)), and one questionnaire that had been used previously to measure staff's perceptions of innovation at their workplace ([Welbourne et al., 1998](#)). Studies showed that these questionnaires had been translated into different languages ([Alghamdi, 2018](#); [Luu et al., 2018](#); [Salas Vallina et al., 2019](#)) and proven effective in various contexts ([Duc et al., 2020](#)). Since cooperating with different stakeholders is of utmost importance when innovating ([Arenas et al., 2017](#); [Avby et al., 2019](#)), a new measure comprising items on internal and external collaboration was developed. The translation, adaption and development of the LearnOvation questionnaire (LOQ) was based on the guidelines of [Guillemín et al. \(1993\)](#) and [Beaton et al. \(2000\)](#) and is described in detail in [Figure A1](#).

The LOQ comprises four constructs covering the following themes: (1) assessment of your manager's behavior and actions (15 items; 8 on the theme of exploration, e.g. "encourages

Primary care unit	Intervention (1, 2, control)	No. of respondents per data collection		
		Feb 2019	Aug 2019	Feb 2020
A	Control	13	–	–
B	1	10	16	28
C	Control	3	11	9
D	Control	11	21	–
E	Control	12	–	–
F	Control	37	–	–
G	1	43	32	30
H	1	25	23	23
I	Control	5	–	–
J	Control	30	–	–
K	2	–	25	27
L	2	–	20	10
M	2	–	12	16
N	Control	–	23	20

Table 2.
Quantitative data
collection

experimentation with different ideas” and 7 on the theme of exploitation, e.g. “takes corrective action”); (2) assessment of your own behaviors and actions (11 items; 5 items on exploration, e.g. “have evaluated new ways of working, processes or services” and 6 items on exploitation, e.g. “can carry out my work duties with my current knowledge”); (3) assessment of your innovation behaviors (4 items, e.g. “change ways of doing things”); and (4) assessment of your primary care unit’s collaborative capacity (8 items; 4 items on internal collaboration and 4 items on external collaboration, e.g. “. . . with universities”).

All 38 items in the LOQ are Likert scales with five response options: disagree, partly disagree, partly agree, agree and strongly agree. The instruction was to assess experiences from the last 2 months when answering the LOQ. The questionnaire also included descriptive questions regarding profession, age and years in practice, but these were not used in the psychometric testing. The sample included participants in roles such as physicians, administrative staff, nurses, occupational therapists, dieticians, psychologists, physiotherapists and assistant nurses in the health care organization. The descriptive data for the subscales are shown in Table 3.

Ceiling effects were present in the LOQ, but there were no floor effects. The lowest value (disagree) was rarely used (not at all for 13 items). The ceiling effects show that the highest value (totally agree) was used by a high percentage of the respondents. The highest value (totally agree) was used for all items. There were strong ceiling effects for all items in construct 1 “the manager’s opening and closing behaviors,” ranging from 20% to 65%. In construct 2, “the employee’s exploration and exploitation behaviors,” all but two items had ceiling effects (range, 20–51%); item 19 mainly focused on achieving short-term goals (exploitation) and had a ceiling level of 12%; item 24, “. . . have invested in renewal of services or processes (exploration),” had a ceiling level of 14%. Construct 3, “self-reported innovation behaviors,” did not show any ceiling effects (range, 3–10%). Regarding construct 4, “the organization’s collaborative capacity,” all but two items had ceiling effects (range, 16–29%). The two items without ceiling effects (external collaboration) were item 36, “. . . with other primary care units” (6%), and item 37, “. . . with universities” (7%).

The internal consistency reliability of the subscales of the LOQ showed good reliability with a Cronbach’s alpha of 0.90 for the complete LOQ. For subscale 1, *manager’s opening and closing behaviors*, Cronbach’s alpha was 0.83 for explore and 0.86 for exploit. Subscale 2, *Employee’s exploration and exploitation behaviors*, had somewhat lower internal consistency reliability: 0.73 for explore and 0.65 for exploit. Subscales 3 (*self-reported Innovation Behaviors*) and 4 (*organization’s collaborative capacity*) had high levels of Cronbach’s alpha: 0.86 and 0.89, respectively. Thus, overall, there was acceptable internal reliability of the subscales and overall LOQ.

Measure time	N	Min	Max	Mean	Std. deviation	Std. error of mean
Spring 2019	164	22	40	34.42	4.15	0.32
Fall 2019	154	22	40	32.36	4.52	0.36
Spring 2019	169	18	35	30.18	4.00	0.31
Fall 2019	159	18	35	27.82	4.10	0.33
Spring 2019	173	13	30	24.92	2.50	0.19
Fall 2019	170	13	30	24.49	2.26	0.17
Spring 2019	183	9	25	18.44	3.23	0.24
Fall 2019	180	9	25	17.64	3.16	0.24
Spring 2019	182	4	20	13.51	2.70	0.20
Fall 2019	178	4	20	13.48	2.56	0.19
Spring 2019	180	8	20	15.83	2.64	0.20
Fall 2019	172	8	20	14.60	2.61	0.20
Spring 2019	139	4	20	11.99	3.65	0.31
Fall 2019	143	4	20	10.83	3.53	0.30
Spring 2019	138	13	40	27.77	5.74	0.49
Fall 2019	138	13	40	24.45	5.42	0.46

Table 3.
Descriptive statistics
for exploration and
exploitation measures
for supervisors and
employees, and
internal, external and
total collaboration
scores

Table 4 presents the correlations between each of the LOQ subscales. All of the correlations were statistically significant at $p < 0.001$, except for the correlation between employee innovation and supervisor closing behaviors. Correlations ranged from a low of 0.180 between supervisors' opening behaviors (exploration) and employee innovation behaviors, to a high of 0.634 between internal and external collaboration behaviors. Another strong positive correlation was between employee exploration behaviors and employee innovation ($r = 0.627$). Supervisors' opening and closing behaviors were moderately correlated ($r = 0.450$), while their opening behaviors were also moderately correlated with internal collaboration behaviors ($r = 0.403$). However, their opening behaviors were only minorly correlated with employee innovation behaviors ($r = 0.180$). Employee innovation behaviors also had a relatively small, though positive, correlation with internal and external collaboration behaviors ($r = 0.280$ and 0.285 , respectively).

The construct validity test was done with factor analysis and principal component analysis using the rotation method (varimax with Kaiser normalization) and an eigenvalue > 1 . The 0.5 limit in the factor analysis was set to understand whether there were any significant differences between the correlation of an item and its factor and the correlation between the same item and other factors. Face validity is high, but construct validity measured with exploratory factor analysis is less satisfactory for the LOQ (Table 5).

There were 9 factors that emerged from the factor analysis. Altogether, they explained 69.8% of the variance, with an average of 7.8% for the 9 factors. However, only 5 of the factors explained 7% or more of the variance, and were most reflective of the LOQ subscales as originally constructed. So, those 5 factors are presented in Table 4, with the variances explained included. The average variance extracted for each factor is also given. The factors were mainly grouped logically to the intended dimensions of the LOQ, with the exception of the items concerning the employees' explore, exploit and innovation behaviors. Most of the exploration and innovation behaviors loaded together on one factor, while most of the exploitation items loaded on various other factors (sometimes just 1-2 items).

Analysis of the questionnaire

Correlations were analyzed with Pearson's correlation. Statistical tests of correlation coefficients were conducted and the significance level was set at $p < 0.05$. Pre- and post-test analyses were done through ANOVA. All the analyses were performed using SPSS version 26 (IBM Corp., Armonk, NY).

Subscale	Supervisor Explore	Supervisor Exploit	Employee Exploit	Employee Explore	Employee Innovate	Internal Collaboration	External Collaboration	Sum Collaboration
Supervisor Explore	—							
Supervisor Exploit	0.450	—						
Employee Exploit	0.241	0.418	—					
Employee Explore	0.309	0.182	0.330	—				
Employee Innovate	0.180	-0.053 ^{ns}	0.293	0.627	—			
Internal Collaboration	0.403	0.454	0.379	0.329	0.280	—		
External Collaboration	0.293	0.326	0.301	0.357	0.285	0.634	—	
Sum Collaboration	0.373	0.424	0.372	0.387	0.324	0.867	0.935	—

Table 4. Correlation matrix of LOQ subscales

Note(s): All correlations are significant at $p < 0.001$, except for the -0.053

Component	Item	Loading	Variance Explained
Supervisor opening behavior (exploring) $\alpha = 0.83$ AVE = 0.436	Encourages experimentation with different ideas	0.779	10.7%
	Gives room for own ideas	0.718	
	Encourages daring to try new ways of work/methods	0.714	
	Allows different ways of accomplishing a task	0.704	
	Allows errors (not risk/mistakes concerning patient safety)	0.692	
	Encourages error learning	0.602	
	Encourages risk-taking (not risk/mistakes concerning patient safety)	0.542	
	Gives possibilities for independent thinking/acting	0.533	
Supervisor closing behaviors (exploiting) $\alpha = 0.86$ AVE = 0.485	Pays attention to accomplishing uniform tasks	0.822	12.0%
	Controls adherence to rules	0.789	
	Monitors and controls goal attainment	0.765	
	Established routines	0.757	
	Sticks to plans	0.724	
	Takes corrective action	0.663	
	Sanctions errors	0.506	
	Have performed tasks in accordance with current practice	0.502	
Employee innovation and exploring $\alpha = 0.90$ AVE = 0.558	Work to implement new ideas	0.886	13.4%
	Have invested in renewal of services or processes	0.861	
	Changed ways of doing things	0.840	
	Have explored the possibilities for new ways of working, processes, services and responsibilities	0.811	
	Create better services, processes, ways of working or work activities	0.780	
	Come up with new ideas	0.778	
	Have evaluated new ways of working, processes or services	0.668	
Internal collaboration $\alpha = 0.86$ AVE = 0.534	With other professional groups	0.800	8.1%
	Within my own profession	0.792	
	With co-workers and manager	0.721	
	With patients and users	0.597	
External collaboration $\alpha = 0.89$ AVE = 0.529	With other primary care units	0.809	7.0%
	With other actors	0.741	
	With universities	0.705	
	With students	0.586	

Note(s): **Other items, not loaded on any of the above factors

- Have had to learn new skills or knowledge
- Have been compliant and have had to adapt to a high extent
- Have acted in accordance with existing guidelines
- Can carry out my work duties with my current knowledge
- Mainly focused on achieving short-term goals

Table 5.
Exploratory factor analysis (varimax) calculated with principal component analysis and extraction based on an eigenvalue >1: rotated component matrix

Analysis of the written and oral evaluations

The qualitative data were analyzed by thematic content analysis according to Kirkpatrick's model (1996), which is based on four levels of criteria to evaluate the effectiveness of learning solutions: level 1 reaction measures how participants react to training and the experience of the benefit of the activity; level 2 learning analyzes if the experiences lead to changes, such as

an increase in knowledge, skills or experience; level 3 behavior looks at what the participants transfer into action, indicating knowledge to action; level 4 results determine if the changed behaviors had an impact on practice, such as increased patient or employee satisfaction, or lower cost (for a detailed description of the categories and quotes, see [Table A2](#)).

Results

Learnings at four levels – qualitative analysis

The analysis of the written and oral evaluation suggests that learning occurred on Kirkpatrick's learning levels. At level 1, participating in the LearnOvation program was described as meaningful in itself. The program was motivating and provided inspiration and energy for ongoing and new improvement work. Several participants appreciated the boundary-crossing experience of sharing experiences and ideas, which challenged their own ways of thinking and working. They valued the participation of the entire management team, because it provided mutual time for talking and reflecting on various practical issues but also because of its team-building quality. The opportunities to get to know each other better and increase consensus within the management team were factors understood to be motivating and promising for further work.

At level 2, participants described learning as acquiring new knowledge, new insights or deeper understanding. Furthermore, LearnOvation supported and verified their existing knowledge and working methods, because they simultaneously became aware of their own strengths and weaknesses by enabling these to be articulated and scrutinized. Participation in LearnOvation was understood to strengthen the ability to see an argument from a theoretical point of view, especially when balancing the space for both exploration and exploitation activities. New ways of thinking were provided, and concrete improvement ideas were created that were argued to be easily applicable in their own setting. Participants described the benefits of learning new tools for working, particularly related to supporting exploration and exploitation behaviors.

At level 3, accounts of no behavioral changes were described, which was due to the participant's nonuse of the tools or methods provided, whereas other accounts portrayed ways of improved working processes, especially with regard to new ways of working within the management team. Teams had applied various methods and working tools from the LearnOvation program to set goals and develop workable structures and follow-up techniques, but also to involve and engage employees instead of doing everything themselves. A common experience was behavioral changes related to aspects of exploration that aimed to involve employees, such as using the tools 1-2-3-all and TRIZ from Liberating Structures ([Text Box 1](#)), and the use of positive feedback to encourage employees.

At level 4, participants acknowledged that it was too soon to provide examples of how the program had affected practice results. However, there was a reasonable understanding of improvements in the workplace climate, especially as they believed that their ability to encourage and support teamwork was improved. The participants experienced a better workplace climate when using Liberating Structures, because this empowered the employees to engage and participate on a whole new level. Despite the lack of reports on innovations, participants expected and believed that the LearnOvation program had the potential to influence and improve health care, but only if the plans that were initiated were sustained and implemented.

Ambidextrous innovation behaviors – quantitative analysis

Before participation in the LearnOvation project, there were no statistically significant differences between the participating primary care centers or for the primary care centers

acting as controls. Analysis of the responses of the LOQ from each of the primary care units did not show any significant changes in either exploration or exploitation behaviors during the period of the project for participating primary care units or control groups. One primary care center had significantly lower mean values on leader explore (difference 0.28 points, $p < 0.004$) and leader exploit (difference 0.31 points, $p < 0.009$), which did not remain at the third measurement, that is, at the 6-month follow-up. All other primary care centers had no significant differences for any of the mean values of the measures. Thus, according to the results of LOQ, the LearnOvation program did not improve innovation skills and behaviors of staff or leaders. To further explore the potential effect of the LearnOvation intervention, four primary care centers were also measured a third time (6-month follow-up) in accordance with the project plan, without showing significant differences for any of the six subscales when measured with one-way ANOVA and post hoc Tukey-B. Thus, according to the results in LOQ, the LearnOvation program did not improve innovation skills and behaviors of staff or leaders.

Discussion

The current study aimed at accessing the impact and effectiveness of the LearnOvation leadership development program. The goal of the program was to increase management's innovation leadership skills in daily practice by introducing and practicing exploration and exploitation behaviors. Thus, our ambition was to contribute novel knowledge on *how* to organize processes of innovation and support exploration and exploitation behaviors in daily practice. The overall qualitative findings indicated that the management teams became better equipped to promote employee participation in daily work, using methods that support both exploration and exploitation behaviors. Participants experienced the program as meaningful, inspiring and providing new theoretical knowledge and applicable tools to create an engaging work environment. Behavioral changes were reported among those who actually made use of the new tools and knowledge, which, in turn, seemed to improve the teamwork and workplace climate at the participating primary health care centers. According to the participants, a larger number of people contributed to the discussions, and the number of ideas increased. An interesting finding was that professionals also proposed ideas for improvements later on, suggesting that their experience of being involved and the leadership's expectation and appreciation of suggestions were beneficial.

Change at the primary health care level through the LOQ showed that there was already a high level of innovation skills, but an improvement over time regarding ambidextrous innovation behaviors was not seen. The centers had a higher score for internal collaboration than for external collaboration, suggesting that potential for improvement lies in increased boundary-crossing activities and collaboration, which has been found in previous studies (Avby *et al.*, 2019; Kjellström *et al.*, 2017). The importance of team collaboration for the creation and implementation of ideas was mirrored in the participants' descriptions of the learning outcomes. Quantitative results suggest that leaders' opening (exploring behaviors) can positively impact internal collaborations. These same behaviors were surprisingly not correlated with employee innovation, though *employee* exploration behaviors were strongly correlated with their own innovation behaviors, so perhaps leaders can encourage employees to explore more, resulting, in the longer run, in greater employee innovation.

Theoretical contributions

Staff at all centers manifested high levels of exploration, exploitation and innovation behaviors, which contradicts previous studies that argue that there is internal resistance to

innovation in the public sector (Cinar *et al.*, 2019). Thus, this study contributes to the literature on innovation in organizations by showing that high levels of exploration and exploitation behaviors in an organization are imperative for encouraging innovation. These findings can partly be explained by the characteristics of the participating centers, such as a long track record and experience of continuous quality improvement, a strong valuebase focused on the needs of patients, low staff turnover, positive financial development and high scores in the regional quality comparison. One of the participating centers had been engaged in a previous study that focused on top-performing health care centers in the region, and two other centers, engaged in the same study, had been chosen deliberately for comparative purposes (Avby *et al.*, 2019). Thus, our study may confirm the literature on ambidexterity theory, which implies that if managers and teams are good at managing both exploitation and exploration activities, organizational performance can improve (Crossan *et al.*, 1999; Gibson and Birkinshaw, 2004; Gupta *et al.*, 2006; March, 1991; Rosing *et al.*, 2011).

A reasonable suggestion that follows the results of the study is that at an organizational level, exploitation practices need to be in place to allow time for exploration initiatives. The organizations had different possibilities for engagement. In RJC, self-selection and internal encouragement resulted in centers with management teams highly motivated to be part of the program (Lacerenza *et al.*, 2017). In BD, although participation was sanctioned at a strategic level, the time from commitment to implementation of the first program was lengthy, which involved unforeseen practice changes that pressured both managers and staff and that we believe may have prompted two centers to drop out. If the working situation is under high pressure, the focus is on exploiting existing competencies to deliver expectations; thus, there is little space for exploration activities. This pattern was similar to a previous study in the same context (Avby *et al.*, 2019). Paradoxically, the centers that could gain most from the program did not have the time to participate. Ambidexterity theory is helpful here, because it suggests that exploitation and exploration are needed at an organizational level (staff with one or the other competence) as well as at an individual level (each person can balance or specialize in exploitation or exploration behaviors).

The measures of the various subscales of the LOQ showed good internal reliability but did not then load similarly in the factor analysis. Further reflection on this is needed, as the employee exploration and innovation behaviors loaded together showed good reliability as individual measures. There was a strong positive correlation between the two subscales, perhaps indicating a more underlying common factor. The lack of uniform loading of the employee exploitation behaviors together on one factor in the analysis also bears further investigation.

The participation of the whole team was a defining and powerful feature of the program. This can be seen as an example of collective leadership development; qualitative results indicated that individual leader capacity increased among key persons that provided a potential pipeline for future leaders, and collective leadership capacity within the management also increased. After participating in the LearnOvation program, the management teams were better prepared to create an engaging workplace environment and utilize the entire staff's capacity for innovation by using methods and tools that support exploration and exploration activities. Thereby the result adds to plural leadership research that focuses on sharing leadership for team effectiveness (Denis *et al.*, 2012; Ospina *et al.*, 2020), but also to leadership *development* as a group, and methods to support this change (Kjellström *et al.*, 2020). The potential to improve ambidextrous behaviors through collective leadership development activities is a future fulfilling research topic.

Practical implications

The program has three main practical implications: (1) to direct leadership development activities to the entire management team for increased implementation power, (2) to consider

both exploration and exploitation activities to create sustainable innovation work and (3) to use methods that promote the fullest participation as possible. This may be especially important in the welfare system, given the highly structured system and functioning of this sector. Supporting opportunities for innovation behavior in such a structured arena may have a greater impact here than in some other sectors, such as technology, where innovation is a more core element of functioning. In this way, improvements in welfare services can be achieved, while also enhancing the work experiences of employees in this sector.

It is valuable to direct leadership development activities to the entire management team, instead of only the formal managers. First, an all-inclusive program increases team spirit, provides a clearer direction within the group and strengthens the overall change-making power. Second, it has practical advantages, for example, when someone is absent on one occasion, the other team members are there to pick up the work. Third, team leadership and the power of execution increased because they prioritized taking time for (reflection) working together to solve issues. Formal scheduled opportunities to meet and discuss matters of relevance to managers' learning are associated with workplace reflection and learning (Nilsen *et al.*, 2012), and thereby deliberately create on-the-job leadership development (McCauley and McCall, 2014).

A unique feature of this study is that ambidexterity theory was central both in the design and the content of the program. The results show that the program helped the management teams to "walk the talk" of innovation through the unique combination of theoretical knowledge and practical tools based on their mapped learning needs. A central element of the program and an important result is the value of the use of creative methods to involve staff in the production of novel and useful ideas. The exploration tools such as 1-2-4-all and TRIZ from Liberating Structures (Text Box 1) also provided boundary-crossing structures to enable reflection and the engagement of staff to contribute to a greater extent with ideas for improvement and innovation. These tools are simple to learn, and because the whole management team participated, they could go back and try it out with different professional groups at the primary care centers, which meant that there was inbuilt potential for greater spread of the program to all staff at the centers. LearnOvation also introduced exploitation tools, such as practicing corrective feedback, which is an important tool for triggering the production of ideas in teams. Based on the results, we suggest that both exploration and exploitation activities need to be considered to create sustainable innovation work.

Limitations

This is one of the first longitudinal programs in which the questionnaires that make up the LOQ are used together with qualitative data. A drawback was the unforeseen resistance from staff to provide names on the questionnaire, which eliminated the possibility of intra-individual follow-ups over time, as has been conducted in other studies (Gerlach *et al.*, 2020; Rosing and Zacher, 2017). With regard to the study protocol, there were some necessary design adaptations, but in collaborative research, the scientific approach must be flexible in the face of practical considerations. Ceiling effects showing that the highest value (totally agree) was used by a high percentage of the respondents have at least partially weakened the possibility of getting the effects as we had hoped. Our results show the value of using a mixed-methods design to gain deeper insight into the outcomes of innovation programs, and how those insights can lead to further interactive development of the program to meet the needs of the participating units.

Conclusions

When designing support and selecting programs intended to enhance the organization's implementation of creative ideas, the use of a collective approach that targets the whole

management team seems essential. Programs are complex, and when studying them, it is valuable to use a mixed-methods approach to capture different aspects. It is also important to work with creative methods that send out the message that everyone's perspectives and ideas are important and contribute to the organization's innovativeness. By targeting the whole management team, the skills of leading innovation can be distributed in the organization to better support the implementation of creative ideas. Innovation is about creating a fertile ground for exploration and exploitation processes of learning that support the organization's ability to meet goals and targets and follow routines, as well as the capacity to explore new ideas and allow experimentation.

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Learning seminar 1: Managing learning (3 h)	Learning seminar 2: Monitoring performance (3 h)	Learning seminar 3: Adjusting to requirements (3 h)	Learning seminar 4: Collaborating with others (3 h)
<p>Introduce theoretical conceptual frameworks of intervention. Cover knowledge about learning and how exploring and exploiting behaviors can promote innovation power</p> <p>Results from the survey are presented and discussed</p> <p>Practical group exercises are carried out. E.g. choosing duties that can be removed or performed to a lesser extent</p> <p>Introduction of assignment and exercises to work with before learning seminar 2</p>	<p>Follow-up the previous workshop and assignment. Share experiences with participants from other primary care units</p> <p>Create continuity of theoretical and practical knowledge on monitoring performance. Work systematically with quality improvement work, measurements and action plans</p> <p>Practical group exercises are carried out. E.g. each management group works on a challenge that has been identified at their unit, and set goals to meet the necessary change. Then, the management groups exchange goals with each other and through a creative process develop activities that may lead to goal fulfilment</p> <p>Introduction of assignment and exercises to work with before learning seminar 3</p>	<p>Follow-up the previous workshop and assignment. Share experiences with participants from other primary care units</p> <p>Focus on increasing compliance with existing policies, procedures and agreements. It also includes the theory in use and espoused theory and how to provide feedback</p> <p>Practical exercises with emphasis on behavior through giving and receiving feedback and highlighting defence mechanisms</p> <p>Introduction of assignment and exercises to work with before learning seminar 4</p>	<p>Follow-up the previous workshop and assignment. Share experiences with participants from other primary care units</p> <p>Continue learning about how innovation capacity is promoted by co-production and teamwork in complex systems</p> <p>Practical exercises are about identifying how the units/professionals cooperate with patient and other stakeholders; identifying the next step to improve innovation power at their own unit</p>

Table A1.
The content of the
learning seminars

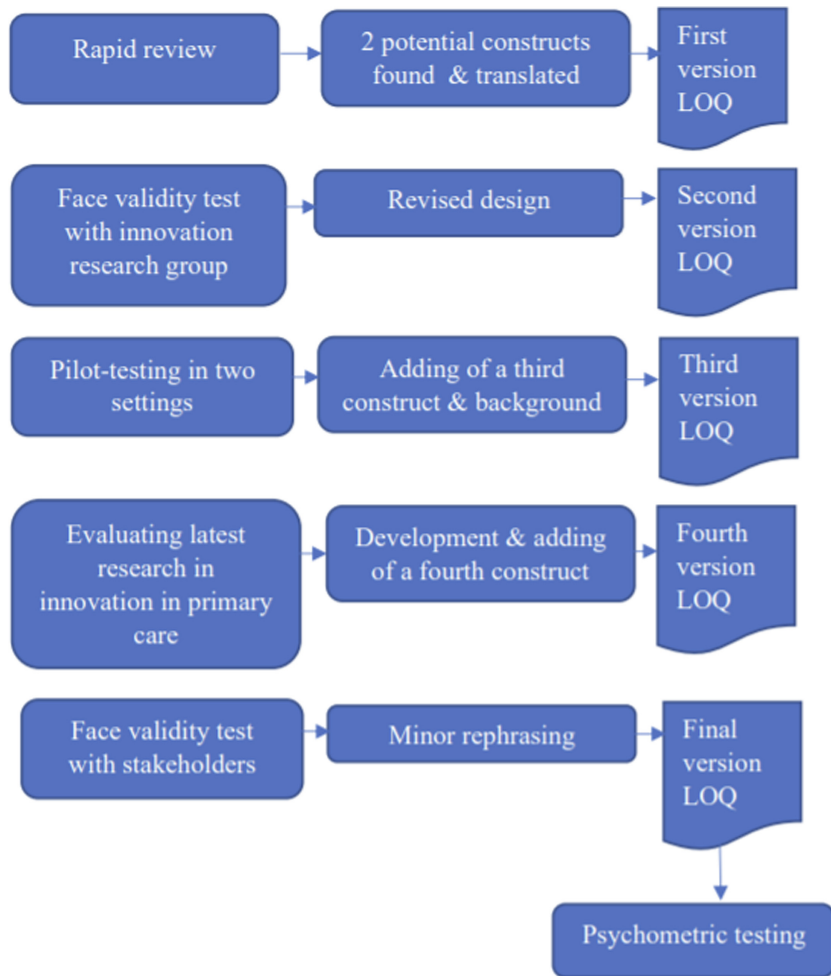


Figure A1.
Process of developing,
adapting and testing
the LearnOvation
Questionnaire

Table A2.
Results structured in
Kirkpatrick's model

Levels of learning	Categories	Quotes from the evaluations
L1 reactions	Motivating Boundary-crossing Experience sharing Team-building quality	Energy for change work we are already doing Good to get other people's views on what we do Good to hear how others are doing Very good with reflection time together in the management team, outside of their own workplace
L2 learning	Creating awareness New ways of thinking New tools for working	Not much "new theoretical knowledge," most of which we knew, but the program refreshes, picks up and points to existing knowledge. Get to know myself more. See my strengths but still weaknesses and what I can/must change/improve myself New ways of thinking and tackling challenges in everyday life; great and challenging! Very exciting theoretical models that can be implemented directly in the business through the practical exercises
L3 behavior change	New ways of working within the management team New ways of involving employees No behavioral changes	Follow-up on what we have decided. The management team is better at evaluating and following up Uses the tools introduced (especially 1-2-3-all) in several contexts, e.g. meetings and development days. The management team has given up some control and the profession's opinions are valued and taken care of better We have not tested anything together with our employees yet. What has happened is mainly between us who participated in the program
L4 results	Expectations Improvements of the workplace climate No results	So far, not so much impact, but hopefully going forward Experience that the staff also have more fun at work. More participation and more energy in the group Do not think the business has noticed any effects yet

Text box 1. The 1-2-4-all Liberation Structures to enhance creativity and participation

The 1-2-4-all method is one example of Liberating Structures that is easy to learn and to implement. The method is practicable when a group needs to explore a question and collect a number of ideas and solutions. The method begins with 1 min of personal reflection where each person gets the chance to formulate their own ideas or thoughts. The next step involves pair sharing with another person for 2 min. This step allows for your ideas to be confirmed, refuted or elaborated on. Then, two pairs line up with each another, creating a quartet, as they share their main insights and ideas so far but also look for patterns and common themes. In the final step, the ideas are shared within the large group, by, for example, moving along each group that contributes an idea until all ideas are collected. If necessary, the process can start all over again by exploring one of the ideas. In the basic model, the numbers equal the number of participants but also the time spent on each phase, which could be amended depending on the task.

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