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Facilitating Knowledge Sharing – Improving Sop Adaptation And Cross-Sectional Collaboration

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Abstract

Due to a lack of cross-sectional collaboration and standardization in job performance in a 'Finance and Accounting department', at a large public Danish University, the management decided on two interventions: Firstly, eight operations employees participated in a ten-hour Training Within Industry – Job Instruction (TWI-JI) course and secondly a trainer Community of Practice (CoP) was established.

The study followed the case in a ten-month period. Qualitative data for the employee perceived organizational change and the employee-assessed causes of the change shows that TWI-JI was mostly related to changes in training and less to knowledge sharing. Analysis of the time trainers used on training and on the development of job instructions (JI's) shows that trainers performed activity related to the change causes .

The study documents that the case company experienced a substantial positive change within the organizational capabilities 'Training' and 'Knowledge sharing', and that the TWI-JI intervention has played an important role. We propose that TWI-JI could play an important role in organizational knowledge sharing because the method can improve the organizational capability to develop knowledge through JI development and share knowledge through training sessions.

The lack of data describing process change and by this being a single organization case study limits the results.

1. Introduction

Public organizations are continuously required to improve both efficiency and effectiveness and consequently public organizations adopts improvement methods from the private sector. A frequently used improvement method is to standardize how work activities are performed by describing processes in Standard Operating Procedures (SOPs) that guide employees in how to perform their job.

The Finance and Accounting department of a large Danish University, attempted to standardize processes across eight sections but large variation in job performance across teams and sections remained. In general, a lack of commitment and belief in standardized work was a dominant characteristic of the case organization. In response, the management decided on two interventions: First, education of a group of operation employees as trainers and making them responsible for writing SOPs, training employees and sharing knowledge cross-sectional. The education comprised a ten hour Training Within Industry - Job Instruction (TWI-JI) (Dooley 2001) course to equip the eight operations employees with relevant competences and certify them as trainers. Secondly it was decided to establish a trainer community of practice (Wenger et al. 2002) (Called 'Trainerforum') where trainers could meet and interact.

TWI-JI is a method for educating operation employees in using a training method and writing SOPs to actively disseminate institutional knowledge (Dooley 2001). Despite TWI-JI's popularity among practitioners, few scholars have studied TWI-JI and its effect on knowledge sharing in operations. This paper studies the effect a TWI-JI intervention has on an organization and discusses it from an organizational learning perspective.

The study deploys a single organization case study method and follows a TWI-JI intervention during a ten-month period and qualitative data evaluates the effect of the TWI-JI intervention through employee perceived change, Trainerforum meeting minutes and quantitative data for the time use for training and SOPs developed.

1.1 Theory background

Training Within Industry - Job Instruction

Training Within Industry - Job Instruction (TWI-JI) consists of two parts: a method for breaking down a job in to a concise description of how the work is done (See figure 1) and a four step training method (See figure 2). The work descriptions are called Job Instructions (JI) and the text is divided into important steps (*What you do*), key points (*How you do it*), and reasons for key points (*Reasons for doing it*). TWI-JI trainers learn to break the work down into these elements. The four steps of the training method is prepare, present, try out, and follow-up and the trainers apply the method during 1:1 training sessions with employees.

Budget Beacon

Opdatering af skæringsdato på flere projekter.

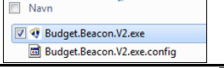
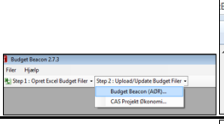

| Hvad | Hvordan | Hvorfor | Illustration |
|------------------------|--|--|--|
| 1) Opstart "Beacon" | 1) Åben "Program" Mappe 2) Start "Budget.Beacon" | 1-2) For at kunne opdatere flere projekter samtidig. |  |
| 2) Vælg sektion/område | 1) Åben "Step 2 Update" 2) Vælg sektion 3) "Vælg mappe" 4) "Close" | 1-4) For at kunne tilgå de ønskede projekter. |  |
| 3) Vælg projekter | 1) Marker alle ønskede projekter 2) Tryk "Opdater skæringsdato" 3) Vælg ønsket dato 4) "OK" | 1-4) For at kunne opdatere ønskede projekter. |  |

Figure 1: This is an example of a guideline developed by the trainers after having learned to describe a job in what (important steps), how (key points), and why (reasons for key points). Visual aids in the right column support the text.

| | |
|---|--|
| <h3>HOW TO GET READY TO INSTRUCT</h3> <p>Have a Time Table— how much skill you expect him to have, by what date.</p> <p>Break Down the Job— list important steps. pick out the key points. (Safety is always a key point.)</p> <p>Have Everything Ready— the right equipment, materials, and supplies.</p> <p>Have the Workplace Properly Arranged— just as the worker will be expected to keep it.</p> <p>Job Instruction Training</p> <p>TRAINING WITHIN INDUSTRY Bureau of Training War Manpower Commission</p> <p>KEEP THIS CARD HANDY GPO 16-35140-1</p> <p>Front of the Job Instruction Card</p> | <h3>HOW TO INSTRUCT</h3> <p>Step 1—Prepare the Worker Put him at ease. State the job and find out what he already knows about it. Get him interested in learning job. Place in correct position.</p> <p>Step 2—Present the Operation Tell, show, and illustrate one IMPORTANT STEP at a time. Stress each KEY POINT. Instruct clearly, completely, and patiently, but no more than he can master.</p> <p>Step 3—Try Out Performance Have him do the job—correct errors. Have him explain each KEY POINT to you as he does the job again. Make sure he understands. Continue until YOU know HE knows.</p> <p>Step 4—Follow Up Put him on his own. Designate to whom he goes for help. Check frequently. Encourage questions. Taper off extra coaching and close follow-up.</p> <p>If Worker Hasn't Learned, the Instructor Hasn't Taught</p> <p>16-35140-1</p> <p>Back of the Job Instruction Card</p> |
|---|--|

Figure 2: A card for the trainer contains a description of the training method. There are four training steps (prepare, present, perform and follow-up) and is guide that the trainer follows to provide a comprehensive training (Dooley 2001).

During the WW2 the 'The training Within Industry Service' agency established the TWI-JI program to support the American production of war material. The program was a response to the question asked by Army planners 'What can be done to turn out more tools, to build more plants, to make more people productively useful?' (Dooley 2001). Later adopted Toyota the program and incorporated it as a part of their Lean manufacturing system and their continuous improvement system.

Communities of Practice

A Community of Practice (CoP) is a *'Group of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis'* (Wenger et al. 2002, p.128). CoPs are informal by nature as they thrive on a shared interest and a motivation to interact, consequently organizations approach CoP development and support through soft management approaches (Wenger et al. 2002; Scarso et al. 2009). An intentional CoP development process is characterized by focusing CoPs on issues that are important to the organization, establish community goals and deliverables, provide real governance, and setting high management expectation (McDermott & Archibald 2010). Intentional CoPs are found to improve problem solving and knowledge sharing (McDermott & Archibald 2010). In combination with SOPs CoPs are found to increase SOP compliance (Fung-Kee-Fung et al. 2013; Schenkel & Teigland 2008), SOP quality and transfer of best practice (Kirkman et al. 2011; Barwick et al. 2009).

1.2 Case organization

The department of Finance and Accounting at the Technical University of Denmark employs around 250 people divided into five divisions. The biggest of these divisions is the division of Institute and Project economy and the case organization refers to this division. The division consists of eight economy sections. Each of the eight sections serves a number of institutes (The Technical University of Denmark consists of 24 institutes) and manages all tasks related to economy e.g. budgeting, project accounting, financial statements etc. A Finance manager (head of the section), two Team leaders and 15-17 Project Controllers (referred to as the operations employees) forms a section.

Today all economy sections sits together in one building in order to increase cross sectional collaboration and standardize processes. Historically, however, the eight sections were scattered around the DTU Campus in different buildings and not gathered in the same division. The current organizational setting is less than two years old.

2. Method

2.1 Interventions

This study follows the project in a ten-month period. In April 2017 eight trainers (one for each section) participated in a two day TWI-JI training workshop, followed by two weeks of practical experience, then a half-day follow-up training workshop, then another two weeks of practical experience before each trainer was certified as a TWI-JI Trainer in May 2017.

Primarily, the TWI-JI course offered a well-proven teaching methodology to equip the trainers with competences required to master training and develop Job Instructions (JIs); however, the course also taught the trainers how the project plays a role in LEAN process standardization. The course was led by external consultant RJ assisted by internal consultant TH. Concurrently, and in coordination with the TWI-JI course, all employees went to courses in feedback and dialogue skills.

After having completed the TWI JI course the eight trainers entered a forum (Trainerforum) purposely formed to discuss JIs, training, and related development projects. One internal consultant and one external consultant facilitated the Trainerforum meetings. In addition to the Trainerforum, JI development meetings took place in between the Trainerforum meetings. The JI development meetings devoted time to the trainers to develop and discuss details of JI's without support from consultants. Only the trainers attended the meetings.

2.2 Method

The study is a single organization mixed method case study (Robert 2017). A case study method was adopted because there is little empirical evidence for TWI-JI application in university administration, and we wanted to study the application and outcome in real life (Robert 2017). Additionally a mixed method research approach was adopted to study both 'how many', 'what' and 'who' and also to provide explanations of 'why' and 'how' (Kitchenham 2010). Prior to the intervention in April 2017 a baseline measurement took place with follow-up measurement ten months later.

The collection of the baseline data occurred at a kick off presentation to present and introduce the project. The employees answered two questions: ‘what will stop happening?’ and ‘what will start happening?’ in order to document what change the employees hoped that the project would bring. TH and RJ divided and categorized the baseline answers into four themes. The follow-up measurement took place at a division meeting ten months later and employees were asked to rate the change on a scale from -3 to +3 for each theme. The employees then had to identify a significant initiative that had caused the change.

Follow up measurements documents the time trainers used per month in the ten-month period on training and activities related to Trainerforum (including development of Job Instructions). For each Trainerforum meeting TH wrote meeting minutes and RJ read and themed the meeting minute.

3. Findings/results

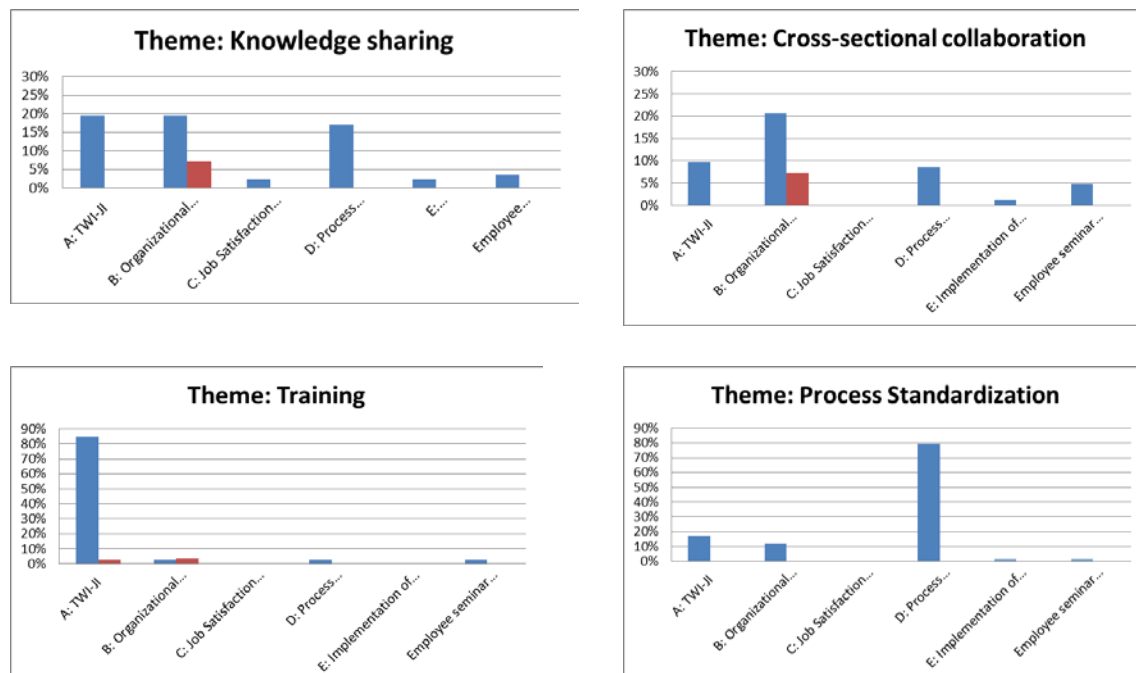
3.1 Exercise: “Away from - Start happening”

Baseline measurement: Before the start of the projects all employees from the case organization answered two questions ‘what will stop happening?’ and ‘what will start happening?’ in regard to what change in the organization the project could lead to. The answers could for instance be “more working together as a unit”, “less differences in work processes” etc. RJ and TH later analyzed the answers and grouped into four themes: knowledge sharing, cross-sectional collaboration, training and process standardization (see table 1).

Follow-up measurement: 10 month after the baseline measurement each employee had to assess how the organization had changed by giving each theme a score that indicated whether a positive or negative change had been perceived. The score went from +3 (most positive) to -3 (most negative) on a numerical scale where 0 was perceived as neither positive nor negative.

Each employee then chose one intervention among six selectable interventions, which had the biggest impact on the perceived change. In cases where no change had been noticed no intervention was selected. The six interventions were the following: A = Training within industry - Job Instruction, B = Organizational changes, C = Job Satisfaction measurements, D = Process Standardization, E = Implementation of new IT-systems, F = Employee seminar workshops.

Table 1 - The results of the employee responses after analysis



3.2 Training data

At the end of the ten-month period, each trainer registered the total of hours spent on training and hours spend on activities related to Trainerforum (including development of job instructions) in each month.

Figure 3, shows that the hours used on training highly fluctuates. The reason being that training mostly takes place when new employees are hired and as the recruitment of new employees follows a nonlinear trend so does the training activities.

Figure 4 depicts hours used on trainerforum and development of Job Instructions. The hours used on trainerforum includes development of the training plan, participation in trainerforum and work meetings and presentations related to trainerforum activities.

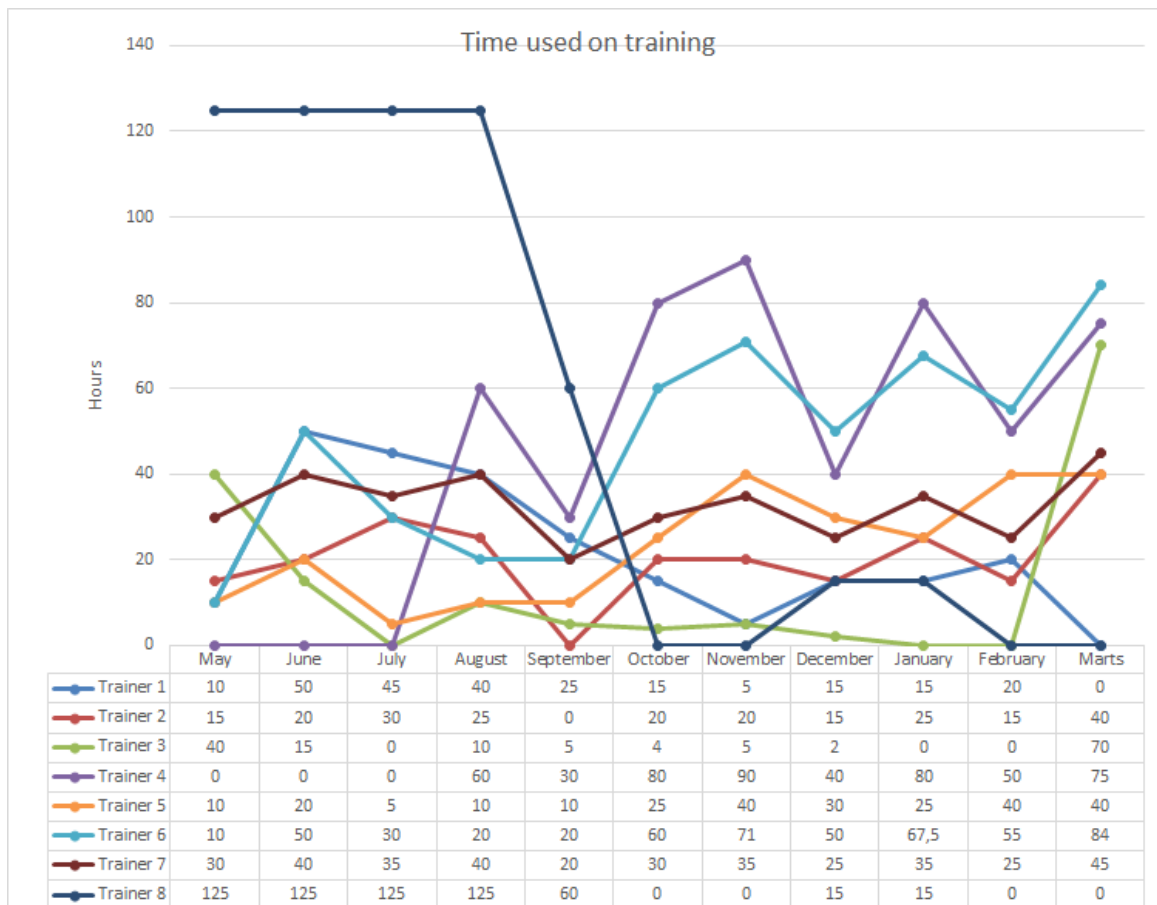


Figure 3: Time used on training

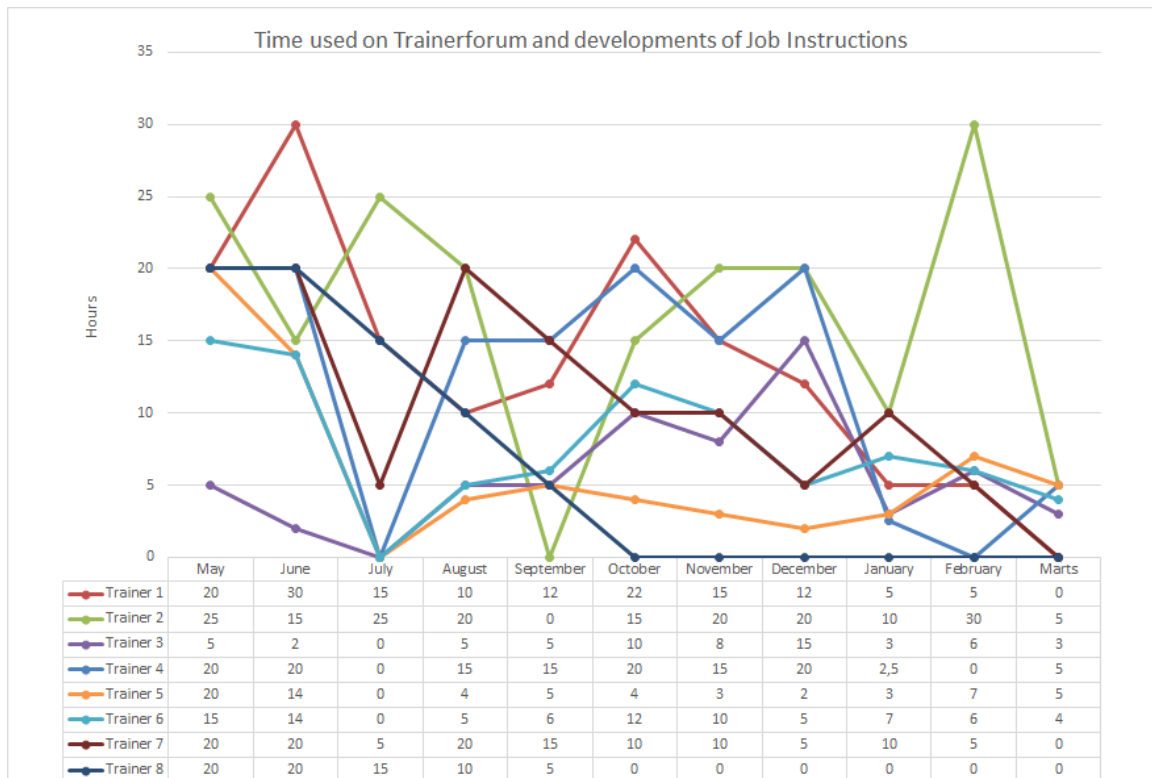


Figure 4: Time used on Trainerforum and development of Job Instructions

3.3 Trainerforum data

Within the ten-month period, the Trainerforum met on ten occasions with a stable show of participants (See table 2). TH and an external consultant facilitated the meetings.

The trainerforum data shows that the theme 'JI development' appears at each meeting. This theme covers either planning of which JIs to make or discussions about JI content e.g. use of words, graphics, or sequence. At 8 out of 10 meetings the theme 'Developing training tools' appears and this theme covers discussion about how to design a training plan or how the JI template should look. The trainerforum took responsibility for developing a training plan purposely designed for new hires.

During the latter part of meeting, sequence 'Training challenges' becomes a recurrent theme. Discussions about training challenges is where trainers share training experiences or ask for advice from other trainers on how to handle certain training situations. Examples of training challenges were a lack of resources for training, difficulties in training a specific personalities and back-up from supervisors.

From the text in the meeting minutes it emerges that two activities frequently take place in between Trainerforum meeting JI development meetings and LEAN process standardization efforts.

Table 2 - Meetings in Trainerforum (TX = Trainer X, IC = Internal Consultant, EC = External Consultant)

| Meeting nr. | Participants | Themes |
|----------------|--|--|
| 1 (2017.08.18) | T1, T2, T3, T4, T5, T6, T7, T8, IC, EC | - JI development |
| 2 (2017.09.04) | T1, T3, T4, T5, T6, T7, T8, IC, EC | - JI development - Training execution - Planning new meeting |
| 3 (2017.09.13) | T1, T2, T3, T4, T5, T6, T7, T8, IC, EC | - Updates from the PM - JI development - Training challenges - Planning new meeting |

| | | |
|--------------------|--|---|
| 4 (2017.10.12) | T1, T2, T3, T4, T6, T7, T8, IC, EC | <ul style="list-style-type: none"> - Updates from the PM - Developing training tools - JI development |
| 5 (2017.10.31) | T1, T2, T3, T4, T5, T6, T7, T8, IC, EC | <ul style="list-style-type: none"> - Developing training tools - JI development - Training challenges - Planning new meeting |
| 6 (2017.11.17) | T1, T2, T3, T4, T5, T6, T7, IC, EC | <ul style="list-style-type: none"> - Updates from the PM - Developing training tools - JI development - Training challenges - Planning new meeting |
| 7 (2017.12.08) | T1, T2, T3, T4, T5, T6, T7, IC, EC | <ul style="list-style-type: none"> - New trainers - Developing training tools - JI development |
| 8 (2018.01.23) | T1, T2, T3, T4, T5, T6, T7, IC, EC | <ul style="list-style-type: none"> - Developing training tools - JI development - Targets for the trainers in 2018 - Training challenges |
| 9 (2018.02.12) | T1, T2, T3, T4, T6, T7, IC, EC | <ul style="list-style-type: none"> - Organisational changes - New processes - Developing training tools - Training challenges - JI development - Targets for the trainers in 2018 |
| 10 (2018.03.10) | T2, T3, T4, T5, T6, T7, IC | <ul style="list-style-type: none"> - Organisational changes - New processes - Developing training tools - Training challenges - JI development |

4. Discussion

By comparing the results with organizational learning theory we see that the trainers contributed to both the feedback and feed forward processes (Crossan et al. 1999).

Feedback and feed forward

The feed forward took place during the JI development where the trainers to some extent defined how to do the job, and described an effective way of doing the job. The trainers collaborated about JI development and through shared interpretation they shared and developed knowledge that is integrated with existing organizational knowledge. Through the efforts of developing JI's trainers combined their tacit knowledge from their operations experience with the explicit knowledge from the existing guidelines. The JI development group share characteristic with a CoP as the trainers share an interest, interact ongoing and deepen their expertise (Wenger et al. 2002). Furthermore, the JI development takes place to develop the organizational knowledge about the practice (Wenger et al. 2002). However the the JI development is a task oriented process with a deadline and voluntary participation was not an explicit recruitment method, and these elements makes the JI development group more similar to a work group (McDermott & Archibald 2010; Agrifoglio 2015). There is a distinction between describing the process and developing the process and the trainers did both, however in the case where a job is solely described and there is no development or learning then there is no contribution to the feed forward process. This could be the case if non-practitioners attempted to describe the job in a JI but we

argue that doing and knowing is inseparable, consequently a non-practitioner is ill equipped to do so and further there would be no shared interpretation and account.

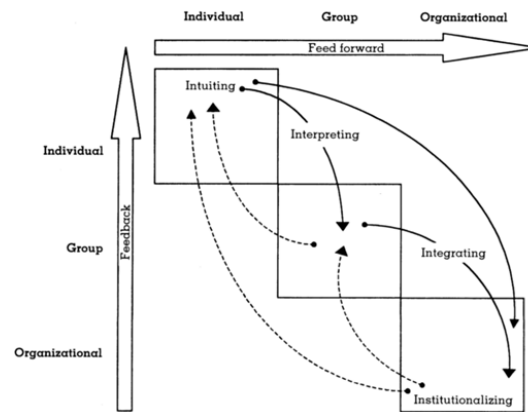


Figure 5: The organizational learning model (Crossan et al. 1999)

Trainers contribute to the feedback process by using the JIs in the training, which facilitates that knowledge that has been accepted by the organization and has become ‘institutional knowledge’ is brought to use at the group and the individual level. By using 1:1 training the trainees are provided a more comprehensive training as both the explicit knowledge in the JI and their individual tacit knowledge is applied during the training session. Additionally, using the JI in a 1:1 training is a change in how guidelines are disseminated, from the prior passive dissemination where guidelines were solely uploaded to a server to an active dissemination that improve guideline effectiveness (Grimshaw et al. 2004). The introduction of JIs also contribute to the feedback process because employees use the JIs for refreshing their memory, which we speculate is consequence of the JIs being significantly improved in terms of relevance and helpfulness cause by a changed layout and having practitioners author them.

We argue that TWI-JI contributes to organizational learning because it is a method that provides operations employees and managers tools and competences to share, develop and use knowledge. However, TWI-JI is not a stand-alone solution as the data (See table 1) shows how organizational changes contribute to knowledge sharing.

Cross-sectional Knowledge sharing

Cross sectional knowledge improves by trainers meeting regularly at the Trainerforum and JI development meetings and through training sessions. At the trainerforum and during JI development workshops each section is represented by a trainer and consequently each section’s perspective is shared, interpreted and integrated. However, other factors that could make an influence is organizational changes were employees change section and also the cross sectional work groups. Future research should study how organizational learning is facilitated across sections in a single organization.

The development of a shared account is an important process for OL and continuous improvement, however it is a process that requires a lot of resources by e.g. taking employees away from a production (McDermott & Archibald 2010; Schenkel & Teigland 2008).

The Trainerforum share characteristics with a CoP. Firstly, Trainerforum are responsible for developing the knowledge within the organization and their work is characterized as ‘long-view’, however this responsibility is also shared with other groups e.g. managers with a different decision competence, and Trainerforum is responsible for specific deliverables e.g. JI’s. Secondly, there is an informal leadership and participants greatly influence what to talk about during meeting. Thirdly, Trainerforum has an external focus as the participants offer their knowledge to colleagues and collaborate with other stakeholders. From the fourth perspective, Trainerforum share very little with a CoP as the participants are responsible for documenting the knowledge and organizing knowledge, and the Trainerforum is mainly responsible for describing the process and less defining or developing. Despite the limited similarity between the Trainerforum in general with a CoP there is difference between the Trainerforum activities, because the discussions the participants have about training

challenges is comparable to a CoP because the Trainerforum develop knowledge, in an informal setting, they seek new knowledge and are focused on sharing and developing knowledge about training.

5. Conclusion

The employees identified a significant change within the themes 'training' and 'knowledge sharing' and pointed out the TWI-JI intervention as a significant contributor to this change. Not surprisingly, the impact of TWI-JI was strongest on 'training' and organizational changes largely caused the change in 'knowledge sharing'.

The study argues that TWI-JI is a method that can support organizational learning and that the method is well suited for the operations and despite TWI-JI origins from production the method is applicable within a public administration. However as this is a single organization study then future studies should take place in different administrative or public organizations to obtain a deeper understanding of how TWI-JI can engage and support employees in organization learning activity.

The results of this study is limited by the lack of data to describe a process change however the employee feedback strongly indications that an intervention outcome. Another limitation is that the effect of the contextual factors, management at several layers and the role of internal consultants is not included, and these appear to be instrumental in bringing about a change.

6. Implications

The study provides practitioners with a structured approach to developing a skilled work force and increase knowledge sharing within an administration having attributes resembling to those in production. The study contributes to organizational learning theory by proposing a dedicated trainer team as a method to facilitate feedback and feed forward, and TWI-JI as method to improve SOP implementation.

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