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Product-Related Learning Activities and Their Impact on the Effectiveness of the Onboarding Process in a Software Development Team

Bachelor of Science Thesis in Software Engineering and Management

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Product-Related Learning Activities and Their Impact on the Effectiveness of Onboarding in a Software Development Team

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Abstract—The effectiveness of the onboarding is of importance to Information Technology (IT) companies since it determines how fast and how well the novice becomes integrated and independent in his or her new role as a developer. The onboarding process in most IT companies is often insufficient or non-existent. In this paper, action design science was conducted to investigate the current onboarding process in Ericsson to find areas for improvement. Two areas were found to be subject for enhancement – technical knowledge, and organizational knowledge. A product-related workshop was developed and integrated into a development team at Ericsson to examine it's effect on the effectiveness of the onboarding process. The workshop consisted of Pecha Kucha presentations to enhance technical knowledge, and LEGO building workshop to enhance organizational knowledge. The workshop showed a modest positive improvement of the organizational knowledge, and no improvement of the technical knowledge.

Keywords— *Product-related learning, onboarding, evaluation, LEGO, Pecha Kucha, active learning, team-building*

I. INTRODUCTION

Onboarding is the process of socialization when a novice, such as a new employee or current employee that enters a new team or project, is comprehending and adjusting to technical and social aspects of a new team, project and/or system [1]. A developer who is established and integrated in a team or project spends around 50 percent of the time on understanding the system, while developing accounts for only 15 percent [2]. During onboarding, the novice often faces challenges particularly regarding the understanding of the product. This indicates that the most time demanding task for a developer, is also the most demanding task for a novice [3]. An even more considerable issue is that, in many cases, no formal onboarding process is present at all. In the cases that they are present however, the process is seldom quality controlled [4]. The absence of quality control means that it is not measured or evaluated whether the onboarding prepares the novice well-enough in understanding the often big and complex product on which he or she will be working.

For the novice to achieve sufficient knowledge and skills about the product through the onboarding process, the following tasks are essential; (1) comprehension of the code and its connection to other development artifacts, (2) understanding of the development process, (3) knowing who to contact for what issues, and (4) which approach is usually taken to handle issues. These activities, also must follow a learning curve, scale to a larger number of novices and to be diverse enough to cover different intended learning outcomes [5].

Ericsson is one of the leading telecom companies in the world that compete for the release of 5G. To remain

market leaders, the company is presently going through a re-organization that requires repositioning current employees as well as hiring new employees. These are aspects that bring out the importance of an effective onboarding process. The effectiveness of an onboarding process describes how the characteristics of the individuals, the onboarding and the organization influence the learning activities and their outcomes. For an onboarding process to be effective, it needs to meet the needs (quick and product-related knowledge acquisition) of the organization and the individual during and after the onboarding.

To make the onboarding process at Ericsson more effective, a new learning activity is introduced to the onboarding process. A clear connection of the learning activity to concrete product-related learning outcomes is anticipated to help the novice become product proficient faster. Additionally, it is also anticipated to help the novice become independent and confident in solving issues and taking help from the right people [5]. Product-related learning refers to tasks that are explicitly related to the product, in the form of user stories and concrete development tasks, as well as issues regarding the environment around the product, such as troubleshooting, architecture and design, and continuous integration machinery.

The goal of this study is to introduce a learning activity that generates a more product relevant outcome of the onboarding process in one of Ericsson's newly formed teams in the organization CNA. The learning activity and its evaluation is also the main contribution of this study. The learning activity is created and developed by conducting an action design research study [7]. Further, the scientific and technical contributions that this introduced learning activity yields include:

- the investigation of the intended learning outcomes of the onboarding process of one team within the CNA organization in Ericsson,
- what learning activities are implemented to fulfill the learning outcomes,
- what impact these activities and outcomes have on the effectiveness of the onboarding, and
- how the effectiveness is evaluated.

II. RELATED WORK

To develop a learning activity that aims to enhance onboarding effectiveness, it is important to be guided by aspects that make up a successful process, as described by Johnson and Senges [5]. Based on the four aspects [5], (1) comprehension of the code and its connection to other

development artifacts, (2) understanding of the development process, (3) knowing who to contact for what issues, and (4) which approach is usually taken to handle issues, that this learning activity must be created. Further, Johnson and Senge [5] mention the importance of following a learning curve that is steep enough to stimulate the learning of each individual, but not so steep that the learning seem unreachable.

Before the development of the artifact can take place, it is also important to research the concrete problem in the development team and compare it to the general problem domain as described by Tiarks [3] and Graybill et al. [4] to establish the concrete problem's generic discourse relevance.

Adequate learning styles, or ways of learning, is another area that impacts the development and evaluation of a learning activity in the onboarding process. When designing the learning activity it is important that it is created to yield the best possible outcome for the team members in their learning. Active learning is described as resulting in high knowledge retention in the students or participants of such an activity. Therefore, during development of the learning activity, Edgar Dale's [8] Cone of Experience is studied to design activities that require active participation of the team members to ensure high remembrance.

In this study, a team-building learning activity was introduced to enhance the product-related learning. According to research [16][17][18], team-building interventions' effect on productivity are difficult to measure due to the predicament to determine correlation and causation. Buller and Bell [16] conducted a study where they analyzed the effect of team-building (and goal setting) on productivity. Their results were inconclusive but indicated a small improvement in some performance and strategy measures. However, the study could not deduce the team-building to be the absolute cause of the improvements. Salas et al. [18] suggest a non-significant improvement on performance from team-building interventions. According to their conclusions, only around 1 percent of the possible factors of fluctuation in a team's performance can be derived to team-building interventions. The study also concludes that the effect of the team-building interventions diminishes as the size of the team increases. Klein et al. [17] study is an update on Salas et al. [18] study summarized above. In contrast to Salas et al., Klein et al. arrive at the conclusion that team-building has a "positive moderate" effect on factors like performance. The study also investigates how team size effects the team-building impact, indicating that small (less than 5 members) and medium teams (5 to 10 members) showed a modest positive effect from team-building. However, teams with over 10 members seem to have a greater positive impact from team-building. These papers were used to understand the impact the team-building might have on the team in this study.

III. RESEARCH METHODOLOGY

In order to understand the state of the art of the onboarding at Ericsson and how the onboarding effectiveness can be improved the following research questions were formulated:

RQ1: What are the intended learning outcomes of the onboarding process in the organization CNA within Ericsson, and what learning activities are involved to complete the outcomes?

RQ2: What learning activities can be introduced to the current onboarding process to enhance product-related learning?

A. Action Design Research

Contingent on the research questions, which require gathering of complex and versatile information from individuals within a restricted population with a unique context, where an artifact (the learning activity) is developed and integrated, action design research (ADR) was identified as beneficial for the conduction and outcome of this study. ADR allows for the creation of an ensemble artifact [7], whose creation cycle is not sequential and does not separate development and design from organizational and social context, even upon idea initialization. ADR further allows for the problem formulation, development, intervention and evaluation to happen in parallel to learning and reflection. This leads to a cyclic and iterative nature of artifact development – ensuring that the context in which the artifact is placed, is not disregarded. ADR favors a constructivist approach where the artifact is not isolated from its social context. ADR supports two contrasting issues: (1) engaging in a problem situation occurring in a specific organizational setting, through intervention and evaluation, and (2) the construction and evaluation of an artifact that tackles the class of problems represented by the specific situation and organizational setting. This method is suitable for addressing the RQs, that together form the same concrete contrasting issues: (1) intervention and evaluation of a given situation in a real and unique organizational setting – i.e. the specific team in Ericsson, and (2) constructing and evaluating a learning activity that will be part of the onboarding in the same unique organizational setting. The context is fitting for ADR since many team members are still undergoing onboarding while this study is conducted, which promotes iterative intervention and evaluation throughout the development [7].

In this study, the research was divided into three cycles, or iterations. The first cycle, idea initialization, focuses on the investigation of the current situation of the onboarding, as well as an idea formulation with input from the sample team and the knowledge body. The investigation of the current situation includes learning about the existing onboarding process and its intended outcomes (RQ1). The second cycle, artifact development, was focused on developing an artifact from the knowledge gathered in cycle 1. This development was done together with the team through brain storming, and through intervention with relevant research in the knowledge body (RQ2), such as papers on Pecha Kucha Presentations [15], LEGO workshops [9][12] and active learning [8]. In the end of this cycle, the artifact was implemented with the team. Cycle three, artifact evaluation and analysis, focuses on evaluation and analysis of the implementation of the artifact. The evaluation assesses whether the artifact did

enhance product-related learning according to Kirkpatrick's [11] evaluation model (RQ2).

B. The Team

The sample team was a development team that is responsible for support of parts of continuous integration (CI) machinery. They work with a wide range of different tasks from trouble reports to visualization tools, and they closely interact with mainly four other CI teams. The sample team consists of five people, who are all developers with various experiences and backgrounds. All team members were novices in the team.

Additionally, there was one more team participating in the workshop. This team was not part of the sample for this research, but participated to enable the learning outcomes for the sample team.

C. The Cycles

Cycle 1 - Idea Initialization During this cycle, the team members were interviewed about their onboarding process - resulting in a total of five interviews. The interviews elicited the team members' opinions about the onboarding in order to yield an understanding of what the intended learning outcomes are and what activities are involved to reach said outcomes. Based on this information, the idea was formulated to comprise an activity that could improve the effectiveness of the onboarding. Further, the concrete information and idea based in this team, was conceptualized into an instance of the problem domain. Meaning that there was a connection between the common discourse and the concrete problem in the team, where the onboarding process was ad-hoc - no formal onboarding process was present, and it was not quality controlled - just as described by other researchers [3][4]. This instance and the generic problem domain were also congruent in the aspect that most novices face challenges in understanding the product in its organizational context [4][5]. The interviews and the research body lead up to the formulation of two learning outcomes that could be added to the onboarding to enhance the effectiveness; technical knowledge, and organizational knowledge.

When the state of the team's onboarding had been investigated and the two learning outcomes established, research within the pedagogical and learning field was consulted to elicit effective ways to reach these learning outcomes. According to Panadero et al. [9] and Dale [8], active learning activities are effective for completing learning objectives and enhancing the learning experience for the participant. An active learning activity can be identified by the participation in, for example hands-on workshops and collaborative lessons where the participants engage with each other to solve a real problem. According to Dale's [8] cone of experience, the participant can remember 70 to 90 percent of an active learning activity. Activities where the participant do not practice active learning, but rather read or listen, only 10 to 20 percent of the content is remembered.

Together with the possible high knowledge retention from active learning [8] and the eventual modest positive im-

pact from team-building [16][18], the idea of an interactive workshop was formulated. Klein et al. [18] suggest that a larger team size (greater than 10) are prone to more positive impact than a smaller team size. Since the workshop initially was supposed to include four teams (a total of around 30 participants), team-building could possibly be anticipated to be beneficial for the teams.

Cycle 2 - Artifact Development During this cycle, the artifact was developed based on the idea formulation from cycle 1. After the data collection in cycle 1, the development of an interactive workshop focused on the learning outcomes of technical and organizational knowledge was initiated. This cycle was dedicated to reviewing various examples of active learning workshops within software engineering that focused on enhancing team building and technical skills. During the development of the artifact the works by Panadero et al. [9] and Lynch et al. [12] on LEGO-workshop were used to learn how interactive LEGO-workshops effected the intended learning outcomes. Panadero et al. [9] suggest that the active learning LEGO-workshop that they conducted enhanced and stimulated the learning of the participants compared to other non-active learning activities. The LEGO is meant to act like a method or a proxy to achieve the actual learning outcome - in this case, the organizational knowledge. Lynch et al. [12] imply that their LEGO-workshop to ground agile development principles did not significantly enhance knowledge retention of the participants compared to lectures. However, the LEGO-workshop was conceived as more enjoyable, an aspect that the researchers deem valuable.

Miller Beyer's [15] research on Pecha Kucha presentations compared to plain power point presentation was used to understand the effect of Pecha Kucha as a way of presenting information. In the paper, Miller Beyer suggests that Pecha Kucha was useful compared to power point, in the sense that it was more enjoyable during creation and had higher quality during presentation. Pecha Kucha (20x20) [10] is a way of presenting a topic in a concise and efficient way. It can be described as a form of Power Point presentations where each slide is shown for exactly 20 seconds, and the presenter is only allowed to use 20 slides. As mentioned earlier, listening merely amounts to around 20 percent remembrance in the participant [8]. To make the Pecha Kucha presentations become an active learning activity, the team was supposed to create the presentations together, and as a final task in the workshop - discuss and present what they learned during the presentation. In this way, the team would participate in designing and performing a presentation which can yield up to 90 percent knowledge retention, according to Dale's [8] cone.

Cycle 3 - Artifact Evaluation and Analysis

During this cycle, the workshop was evaluated and analyzed. Two types of evaluation data was collected, quantitative in the form of surveys and qualitative in the form of observations of the participants during the workshop.

Final Evaluation of the Learning Outcomes.

When the design and implementation of the learning activity were done, the workshop and the learning outcomes

were evaluated. The evaluation was done according to the first two levels of Kirkpatrick's [11] four levels of training evaluation model. Below follows a description of all four levels of evaluation. In this study, only level 1 and level 2 were conducted due to time constraints.

Level 1 – Reaction: This level aims to elicit the feelings, perceptions and experience the participant had of the training. For this study, a survey was conducted to understand how the participants experienced and valued the workshop. This assessment was focused on the organizational knowledge outcome.

Level 2 – Learning: This level aims to elicit the learning outcomes of the training. For this study, a test about the other team's product before the workshop to assess the knowledge of the participants, and the exact same test after the workshop to assess the learning outcome of the activity. This assessment was focused on the technical knowledge outcome.

Level 3 – Behavior: This level aims to elicit how the participants practice and utilize their learning, and if and how it has changed their behavior. .

Level 4 – Results: This level aims to elicit the effect the learning outcomes have on the business and the working environment.

Qualitative data – Observations:

During the workshop, the groups were observed in their way of working together and in their communication. These observations were used to document the possible changes in behavioral or communication patterns of the participants throughout the workshop. The observations were recorded through field notes. When the observation was completed, the field notes were studied and coded to elicit common or special patterns or behaviors among the participants.

D. Threats to Validity

The threats to validity of this study are recognized and analyzed below.

Construct validity, is under threat by not finding a valid model or method according to which the evaluation of the effectiveness of the learning activity can be measured. To mitigate this threat, a recognized model for onboarding or training effectiveness evaluation was used. This model was first developed in 1959, and has been refined by its creator, Kirkpatrick, as well other researchers. The model has been widely used for purposes similar to this study ever since its creation [13][14].

Internal validity, could be under threat since I personally know all the team members. The relationship could cause them to give more positive feedback during evaluation of the new learning activity than would it have been introduced by someone they do not know. To mitigate this threat, the risk will be brought up with the team members and we will discuss how false positive feedback can have negative effects on the study. Emphasis during evaluation will be laid on the importance of honest answers and opinions.

Even though caution was taken during the study to avoid internal validity, the questions of the workshop evaluation

could lead the participants to give exaggerated positive feedback. The positive results of the workshop should therefore be interpreted with vigilance.

Another threat is that the evaluation and measurement of the effectiveness of the learning activity is not valid or does not have clear definitions. Because of this, it is important to use a recognized and detailed evaluation model and measurements, to ensure that the results and outcomes of this study are credible. The extensively used [13][14] model by Kirkpatrick [11] was used for this purpose.

The small team size and whether that sample is generalizable for the population or other companies might be a threat to external validity. However, in favor of data of quantitative measure, this study narrows down to qualitative data points that will be studied in depth over time. The sample is small, and it is not possible to establish whether or no the data collected in the study is generalizable for a wider population. But, as mentioned, this study is context-dependent in its nature.

The reliability of the study is threatened regarding the evaluation and measurement of the learning activity. If there is no recognized model according to which the effectiveness of the learning activity is measured, this study's results cannot be repeated in any other setting. As above-mentioned, Kirkpatrick's model was used.

IV. RESULTS

In this section, the answers to each research question are presented.

RQ1: What are the intended learning outcomes of the onboarding process in the organization CNA within Ericsson, and what learning activities are involved to complete the outcomes?

The data collected during the five interviews of cycle one (Idea Initialization) indicates that there is no structured or formulated onboarding process existing for the team. However, for new Ericsson employees there is an "onboarding-event" where the new employees attend presentations about the company's goals, products and different organizations. This is not related to anything concrete about the product-detailed level of the team, but more of an overview of the entire company Ericsson. The interviews also indicated that there are no formulated learning outcomes of the onboarding, and no evaluation or quality control.

"They try to communicate, in a way. They tell me to work on this thing, in this way. And I say, for what reason? And they say, well, now we're working on it. But why? It's a part of the system. Yes, it's a part of the system I know but. Its these questions which doesn't really fit anywhere. My questions aren't being answered." Says one interviewee as he/she explains if and how learning outcomes of the onboarding were presented to them.

Regarding the onboarding specifics for this team, in the interviews, three areas of improvements could be found common among all interviews. These are:

- Need of organizational context. *"In my case, as developer, I would expect to learn first about the organiza-*

tional environment, in general about the company. And then where is your team and what you are going to do located in that general map for the company. I mean, from the big thing, to the specific thing. That would be easier for everyone, who get onboarding in Ericsson. And I didn't get that map. So that was hard. It's a complete world, and there are many abbreviations, So I was lost in the beginning. Could be much easier if I had a one page map. This is Ericsson, this our area, this our team, and this is what the team will do for this product, and then for this area, and then for Ericsson." One example of an interviewee expressing his/her feeling of lack of organizational context in the onboarding process.

- Need of technical context. "They think like just because you are watching the RBS [an Ericsson product], its like magically trying to get into your head. Which is, nah, that's the wrong way of thinking about it. But that's what they want basically. They think that people learn way too quick"
- Need of knowledge of whom to ask. "I had problem with some [Internal Product] thing, and I sent emails to [Other Team] asking if they know anything. And they are like, no, but we are working on it. I was working on this for like a week and then [Team Member] comes by and says like: Hey, have you asked this guy? And I was just like, No. And then I email him and then 5 minutes later he just send me this 33 pages long API content, and I'm like, You have been sitting on that one? That's kind of a good way of explaining how things work here, some people know it. And you gotta know who to find. And you are probably not gonna find them, until its too late." An example of how an interviewee experienced finding people outside of the team to ask for help.

The interviews also conveyed that the onboarding tasks are product-related in the sense that the novices were always working on items from the back-log. They do, however, not get much guidance when taking on the back-log items, but have to rely on help and time from their colleagues. "And I started to ask questions to others, whoever were like, if I feel like they have some time for me. I started to learn by asking questions actually." This is one interviewee expressing how he/she learned about the backlog items through asking other team members. "And I've been on my own basically. I could ask people. [Manager] told I should ask people, and I did. But still its my own way of coping with it. I like to learn by myself, but I don't think everyone like to do that." Another interviewee on the same matter.

RQ2: What learning activities can be introduced to the current onboarding process to enhance product-related learning?

Based on the data retrieved from RQ1, to answer RQ2, a workshop was developed and conducted.

A. The Artifact

The artifact had the form of a learning activity aimed to enhance the product-related learning of the onboarding

process. The learning activity was a two hour long workshop divided into two learning outcomes;

- technical knowledge, which entails the knowledge about other products, projects and tools that were developed by other teams within the organization, and how the team's own product might be related to said items,
- organizational knowledge, which entails the knowledge about the technical skills and knowledge of other teams within the organization.

For technical knowledge, a presentation part was performed. The teams had to design presentations according to the Pecha Kucha style [10], where each presentation slide is shown for exactly 20 seconds. This creates concise and clear presentation that do not risk getting stuck in too much detail. Before the workshop, guidelines about how to create Pecha Kucha presentations were sent out to all participants via email.

For organizational knowledge, a LEGO building part was performed. Here, the teams were divided into groups with members from both teams. The groups had the task to build a Lego city together. There was a backlog with 11 items, each representing a building or item of the city (such as, shop or bus). All together, 55 minutes were dedicated to the Lego building. These 55 minutes were divided into three "Sprints". The first two sprints lasted for 20 minutes, and the third for 15 minutes. During a sprint, the team chose as many items as they estimate that they can finish. They built the item together, and when they were done, they integrated with each other's items to form a city. In the end of each sprint, the groups evaluated their building process, their strategies and the result. By practicing team-work during the LEGO building, the learning outcome can be reached through actively working on a hands-on problem together with the people relevant to increase the organizational knowledge. The LEGO-building acts as a simulation of real world problems, where the participants have to collaborate, come up with strategies and communicate to solve the problems [9][12]. These are skills that are important to achieve organizational knowledge – being able to work and interact with other teams.

The whole workshop ended with each team discussing and summarizing their learnings during the workshop.

Bloom's [19] taxonomy is a framework to design and evaluate learning objective or learning outcomes. It is however, not to be mistaken as knowledge evaluation of a student. The framework aims to define the cognitive process while learning new skills. The framework is characterized by sequential levels of difficulties, where the first level has to be mastered before the second can be understood.

The technical knowledge outcome intends to cover the levels:

- (1) knowledge – remembering the information presented by the other team, such as product and projects, team members' skills and their Way of Working,
- (2) comprehension – being able to understand the other teams product and projects,

- (3) application – using the information they remembered and understood from the other team’s while answering the knowledge test after the workshop,
- (4) analysis – connecting the products and projects of the other team to their own products and projects,
- (5) synthesis – summarizing the important parts of the other team’s presentation to use in the final presentation at the end of the workshop,
- (6) evaluation – presenting what they learned at the end of the workshop.

The organizational knowledge outcome intends to cover the levels:

- (1) knowledge – remembering the names and skills of other team members,
- (2) comprehension – being able to understand and communicate the instructions during the workshop together with the other team members,
- (3) application – following the instructions to build the LEGO items together with the other team members and interacting with each other to do so,
- (4) analysis – analyzing and communicating across the groups to combine the LEGO items to form a coherent LEGO city. This includes comparing building size and building placements and organization,
- (5) synthesis – creating the actual LEGO items and LEGO city together, and presenting what they learned at the end of the workshop,
- (6) evaluation – evaluation of the group’s own progress during the sprint. This includes being able to describe their building process, strategy and difficulties, and compare these to previous sprints.

Initially, four teams within the CNA organization were supposed to take part in the workshop. One of these teams was the sample team. The other three teams were targeted since they are interacting with or working on related projects as the sample team - hence they were important for the sample team to reach the learning outcomes. Due to a busy schedule, only one of the three additional teams were able to attend the workshop, meaning that the sample team and one additional team ended up participating in the workshop. In total, all five members from the sample team, and three members from the other team participated. The teams were divided into three groups during the workshop. The groups were distributed so that each group had one member from the other team. That would enable the possible achievement of the organizational knowledge learning outcome for all participants.

B. The Sprints - An Observation

During the sprints, the teams were observed to elicit patterns, or changes in behavior over time. Over all, the observations showed unstructured collaboration in two out of three groups during the first sprint. After the first sprint, the collaboration within and between the teams improved. Below follows a chronological summary of the field notes of the observations.

Sprint 1: During the first sprint, only one team was working systematically and structured. The team started by gathering a pile of LEGO, and then discussed their building strategy before stating. During the building phase, the team often stopped for discussions, and re-evaluation of their building. All team members in the team were actively taking part in the discussion. In the other two teams, there was no structure. Each member was focused on themselves and their own building, and all members were building on the same thing at the same time without discussions about a shared view for a final result. Instead of stopping to discuss and re-evaluate, it resulted in frequent exclamations about stress and frustration among some members. It also resulted in the buildings falling apart during construction several times, due to too many hands working on the same thing. All teams managed to finish their items on time before the sprint ended.

After the first sprint, there was a break of 15 minutes. The plan with the break was to make the participants talk to each other outside of their roles as colleagues. The goal with the break was not revealed to the participants. During the break, the participants all actively took part in discussion about various personal matters, ranging from previous working experience, sports and cultural differences among them.

Sprint 2: During the second sprint, the two unstructured teams displayed a difference in their behavior. The systematic team did not show much difference, but continued to work efficiently in the same manner. In the other two teams, the members’ took on different roles. In both teams, one member would take the role of a ”gatherer”, collecting the LEGO while the other two members were building. During this sprint, it was also possible to see that they were discussing the intended end results within the teams and making plans on how to build their items accordingly. The noise level in the room also became much lower, due to less frequent exclamations of stress and frustration. The teams put effort to build more complex and esthetically appealing items during this sprint. Interestingly, all teams also started to look at their own and other’s previous items for size references.

Sprint 3: In the third sprint, the teams did not display much difference in their behavior compared to sprint 2, but they continued to work systematically and stop for discussions and re-evaluations.

After the presentation and LEGO-sessions were done, the teams were asked to discuss within their original development teams what they had learned about the other development team’s members. All participants expressed that they got to know members of the other team better. That they understood that they could work well together under pressure, even though they have different backgrounds. And that if you have a common goal, you can work with anyone sharing that goal. During the presentation, all participants expressed that they feel like it would be easier to cooperate with the other team after this workshop.

After the workshop, the team filled in a form where they got to evaluate the workshop. Please see Figure 1-6 for results. Four out of five team members filled in the form. The team also filled in a knowledge test, one before the workshop,

What was your over-all impression of the workshop?

4 responses

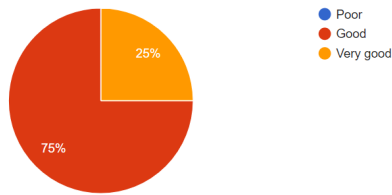


Fig. 1. Answers to Question 1 in survey

The workshop objective/learning outcome was clear to me

4 responses

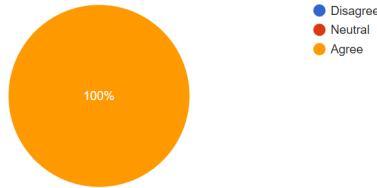


Fig. 2. Answers to Question 2 in survey

and one after. Five out of five team members answered the knowledge tests. The knowledge tests do not show improvement after the workshop. The team members already answered all questions correctly before the workshop.

To conclude RQ2, the study showed some indication of improvement regarding the organizational knowledge. The participants expressed through their final presentations during the workshop that the LEGO-building enhanced the collaboration between the two teams. In the workshop survey, the results indicated that the workshop was relevant for their job and that it had stimulated their learning. The knowledge test showed results that the technical knowledge learning outcome was not improved from the workshop.

V. DISCUSSION

Regarding RQ1, the findings in this study are congruent to the literature describing the general problem [3][4], there was no standardized onboarding process in the team. The team members expressed that they lacked introduction on how to navigate the system – both technical and organizational, and to understand the context in which they are working. This

The content was relevant to my job

4 responses

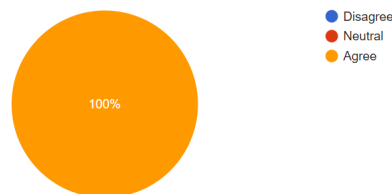


Fig. 3. Answers to Question 3 in survey

The workshop activities stimulated my learning

4 responses

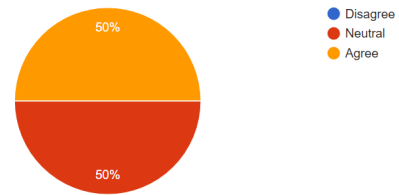


Fig. 4. Answers to Question 4 in survey

What was most valuable of this workshop?

4 responses



Fig. 5. Answers to Question 5 in survey

includes the relationship of their products to others, as well as what team or what person to contact when a problem arises. Such an onboarding could be developed in the near future. As of now, the team is newly formed and the area in which they are working is also in the start-up phase in Ericsson, which could explain the lack of a formal onboarding.

Regarding RQ4, the evaluation of the workshop implied that the participants found the workshop to be valuable for their job. However, these results are possibly biased since the questions in the survey could be leading towards a positive answer. Another aspect is also that the team members know me (the writer), and I work in their team, which could lead to a more positive evaluation of the workshop than had they not known me.

During evaluation of the workshop according to the first two levels of Kirkpatrick's model, results showed the following:

Level 1 - Reaction: The results here indicate that the team members found the workshop to stimulate their learning and that the learning outcomes of the workshop could be of value for them in their future work. Again, these findings are supported by other studies that suggest that active learning activities, such as LEGO building, have a positive effect on the effectiveness and experience of the learning [8][9].

Level 2 - Learning: the Pecha Kucha presentations did not improve the knowledge of the team members. The main reason for this is that the team already had basic knowledge about the products and tools that this other team

What was least valuable of this workshop?

3 responses

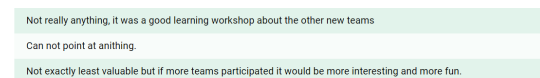


Fig. 6. Answers to Question 6 in survey

is developing, another reason could be that the teams did not put enough effort into their presentations, and instead of strictly following the Pecha Kucha principle of concise and effective presentations, the teams crammed a lot of information into the slides and spoke in very high speed. A future suggestion would be to try to allocate time for a Pecha Kucha introduction to all participating teams. Sending guidelines via email did not seem to be enough for the participants to be able to follow the Pecha Kucha concept fully.

Interestingly, the break during the workshop show indication that, after chatting freely with each other, the team work improved from being unstructured and centered around the individual's own building to being cooperative and including discussions about the end result. However, this could also be the cause of the teams feeling more secure in the second sprint. They knew what was expected of them and were able to focus on the anticipated end result. It is not possible to derive which of these two factors play the role of the change, if it was a result of a combination or if it was a different cause all together. According to Buller and Bell [16], Klein et al. [17] and Salas et al. [18], the impact of team-building on team outcomes is rather ambiguous. It is difficult to point to team-building as the main factor among others for improved outcomes. Also in this study, it is not possible to derive exactly what factors that caused the team to perform better after the first sprint.

To conclude, a product-related learning activity in the form of a workshop focusing on technical knowledge and organizational knowledge (team-building) through active learning showed indications that the organizational knowledge could be enhanced. The results points towards an improvement on the team-building. However, there is a risk of biased outcomes due to the fact that the writer is a colleague of the sample team. The short time is also a constraint, meaning that to yield strong results, the team needs to be studied over time for evaluation of level 3 and level 4 of Kirkpatrick's [11] model. According to the knowledge tests, the technical knowledge did not show any indications of improvement after the workshop. The team already displayed good knowledge of the other team's projects before the workshop. Had all four initial teams been able to participate, the outcome probably would have been different since the other teams do not work as close as the two teams that participated. Therefore the sample team probably do not have as good prior knowledge about their products, and the other teams' Pecha Kucha presentations might have taught them something.

VI. CONCLUSIONS

The objective of this paper is to describe the process and the results of how a product-related learning activity impacted the effectiveness of the onboarding in a development team in Ericsson. A product-related and interactive workshop was developed and implemented. The workshop had two product-related learning outcomes: technical knowledge and organizational knowledge. The workshop consisted

of two parts: a Pecha Kucha presentation focused on the technical knowledge, and a LEGO-building session focused on team-building to enhance the organizational knowledge. The results of the evaluation of this workshop suggest that it might have had a positive impact on the onboarding, since results indicate a moderate enhancement of the organizational knowledge of the members of the development team. It is however, not possible to declare team-building as the factor of this enhancement in organizational knowledge. The workshop showed no indication on improved technical knowledge among the team members.

Future work will include following up this study with an evaluation according to Kirkpatrick's [11] evaluation model level 3 - where the everyday behavior and social interaction between the two teams will be evaluated through interviews and observations, and level 4 - where the manager will be interviewed to understand if and how the quality of the team's every day work has been impacted.

Further, when time can be allocated with the other teams that were intended to join the workshop, one more workshop will be conducted and evaluated according to the same model. Should the second workshop yield a modest positive impact on the learning of the team members and the effectiveness of the onboarding, there is a possibility this workshop could be implemented in other teams within CNA as well. If time and circumstances allow, that future work could be done as an update or continuation of this study.

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