

# Enhancing Learning and Collaboration in Organisations through In-house Crowdsourcing

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**Abstract.** Learning and innovation are central to organisations' development. Insights and innovative ideas occur to individuals. However, learning in organisations takes place at several levels which include individuals, groups, and the organisation itself. Thus, there is a need to enhance the transfer of insights, ideas, and concerns from individuals to groups and to the organisation. This paper explores the role of in-house crowdsourcing and the design of interactive technologies for organisational learning. We build upon our earlier work on the use of interactive technologies for organisational learning. The main research contribution of this work is the conceptualisation of in-house crowdsourcing scenarios to support the design and development of interactive technologies for organisational learning.

**Keywords:** Organisational Learning, In-house Crowdsourcing, Organisational Culture, Interactive Technology, Scenarios.

## 1. Introduction

Organisations often conduct facilitated workshops to identify employees' interests, share experiences and reflect upon issues of concern. The need for determining the relevant contents for the discussion during these workshops, which will also engage and motivate the participants, is a challenge for many workshop facilitators. Furthermore, follow-up activities that collect, support, and share the groups' experiences and learnings can be ineffective or absent altogether. We have identified crowdsourcing as a means of supporting organisational learning [1]. In particular, it could provide the basis for engaging and motivating activities for a broader audience than the selected participants of events such as workshops. Crowdsourcing could leverage on the wisdom and desires of the crowd, providing a better insight for the organisation's decision-making basis.

In this paper, we revisit our proposed framework for organisational learning, Improving Organizational Culture Using Interactive Learning Technologies (ICULT) [1], and describe scenarios for synchronous and asynchronous collaboration and in-house crowdsourcing. We describe two crowdsourcing scenarios to identify organisational activities to support learning among individual employees, groups, and

the organisation itself. The research aim is to conceptualise in-house crowdsourcing scenarios that will help to identify the requirements for interactive technologies for organisational learning. The main research contribution of this work is crowdsourcing scenarios that will support the design and development of the interactive technologies.

The rest of this paper is organised as follows: Section 2 reviews the theoretical background for this work; Section 3 describes the research context and methodology; Section 4 describes organisational learning using interactive technology; Section 5 describes two crowdsourcing scenarios; Section 6 concludes the paper.

## 2. Theoretical Background

### 2.1 Crowdsourcing

The aim of crowdsourcing is to achieve a goal via contributions from many individuals, and it is used as a method for problem solving [2]. Crowdsourcing is defined as "*an online strategy, in which an organisation proposes defined task(s) to the members of the crowd via a flexible open call, in order to harness their work, knowledge, skills, and/or experience*" [3] p.49. Organisations have systematically invited external actors for open innovation and for organisational learning through crowdsourcing initiatives, for example LEGO [4]. When used within an organisation with employees as participants, the term *intra-corporate crowdsourcing* is used for extending problem-solving to self-selected contributors beyond the formal internal boundaries of an organisation [5]. The term *in-house crowdsourcing* that empowers employees to partake in workplace innovation is also used [6]. Intra-corporate crowdsourcing and in-house crowdsourcing can be useful to extend organisational innovation and reap the benefits of the creativity among employees and at the same time maintain control of the associated intellectual property [5].

Four design dimensions regarding crowdsourcing have been proposed: what to crowdsource, who the crowd is, how to crowdsource, and how to incentivise it [2]. There are two important issues to consider when deciding what to crowdsource. They are: What will be shown and communicated to the crowd, and what kind of contributions are expected. In the process of describing the participants in the crowd, it is important to understand which crowds could contribute to achieve a goal, and that different crowds can be accessed through different channels [2]. There are different types of crowdsourcing systems that can support learning and collaboration in organisations, e.g., by using crowd rating systems, crowd processing systems, crowds solving systems and crowd creation systems [7]. The goal with a *crowd processing* system is to integrate individual contributions to find a correct result to a task. With *crowd rating* systems there is no right or wrong solution. The contributions are evaluated in a collective way where every contribution represents a vote. *Crowd solving* systems represent a more qualitative approach where the goal is to find a solution that is as close as possible to the best solution. *With crowd creation systems*, the goal is to produce a satisfying outcome to a task, and the contributions need to be evaluated in relation to each other. What kind of crowdsourcing system one should choose depends

on what the goal of the crowdsourcing is [7]. However, in every crowdsourcing project, it is essential to validate and aggregate the results produced by the crowd [2]. How organisations can use crowdsourcing for learning have not been explored extensively, but organisational learning has been considered as a valuable lens to theorise crowdsourcing. A longitudinal analysis of the LEGO Cuisinart platform showed that crowdsourcing can be an effective and a unique method for organisational learning [4].

## 2.2 Learning in Organisations

Organisational learning is defined as "*the embedding of individual- and group level learning in organizational structures and processes, achieved through reflecting on and modifying the norms and values embodied in established organizational processes and structures*" [8] p.87. Organisational learning is aimed at utilising knowledge and information to change and improve the organisation continually [9]. Learning in organisations is often discussed in the context of individuals within organisations, and in terms of their knowledge, which advances an organisation [10]. Argyris and Schön take this notion further by connecting the knowledge to action [11]; that learning takes place when knowledge is used or applied in the actions of individuals. They enhance the ideas further by arguing the importance of reflecting upon the actions for enhancing the understanding and learning [12]. Kolb described learning as the process of knowledge creation by transformation of experience [13]. In fact, several theories of learning take inspiration from Schön and Kolb and describe the process of learning through reflecting upon one or more experiences. One such theory is the Computer Supported Reflective Learning (CSRL) Model which describes a learning and reflection cycle, where experiences could be shared among individuals, within groups as well as across groups, potentially stimulating a culture of sharing experiences within organisations and learning from each other's experiences [14].

Insights and innovative ideas come from individuals and not from organisations [15]. Thus, the role of individuals is important for organisational learning. However, Kim [10] discusses the risks of losing the balance between the individual learning and the organisational learning. Kim discusses the learning cycle, where the individuals' actions and knowledge impact the organisation's actions, which has consequences to its environment, which includes the individuals, highlighting the importance of the interactions between individuals and the organisation [10]. In addition, the literature identifies a third entity that is important for organisational learning and describes three levels of organisational learning in every organisation: the individual level, the group level, and the organisational level [16].

Organisational learning "concerns growing competence among individuals in communicating and solving dilemmas and problems successfully, both in the short and the long term" [17] p.193. Several frameworks have been identified in the literature. One framework that does not look within an organisation, but rather considers organisational learning as an organisation scanning, interpreting, and learning from its environment was proposed by Daft and Weick [18]. An overview of organisational learning frameworks was provided in [19]. Several of the frameworks addressed multiple levels of learning, e.g., either individual and the organisational levels, or the

individual and group levels. One framework that includes the three levels of organisational learning, the individual, group, and organisational levels, is the 4I framework [19], which is shown in Figure 1. The 4I framework identifies the relationship between individual and the organisation as a feed forward relationship and the inverse relationship between the organisation and the individual as a feedback loop, thus incorporating the idea of the learning cycle described by Kim [10]. Furthermore, Crossan et al. [19] describes these relationships in terms of cognitive processes where individuals have intuitions, which are interpreted and integrated before they could be institutionalised for an organisation to possibly act upon them, to affect their individuals. The process of intuition pertains to individuals and their personal experiences, while interpreting could involve sharing and discussions of ideas, knowledge, and practices at the group level. Integration involves a common understanding and mutual adjustment at the group and organisational levels. Finally, institutionalisation is a means of organisations leveraging on the learning at the individual and group levels and making them a part of the organisation. For example, even if some individuals or groups leave the organisation, the knowledge does not leave the organisation as they are now institutionalised as routines or procedures in the organisation and indeed are a part of the organisation’s culture. Zietsma et al. [20] added attending and experimenting as two action-based learning processes. Attending describes the process of actively searching for and absorbing new ideas at the individual level. Experimenting describes the process of attempting to implement and use new learning through practices of change at the individual and group level. The feed forward and the feedback loops link the three levels of learning to the six learning processes [8]. One of the limitations of the 4I framework is that it does not address the socio-political processes and dynamics within an organisation and how that may affect organisational learning [21].

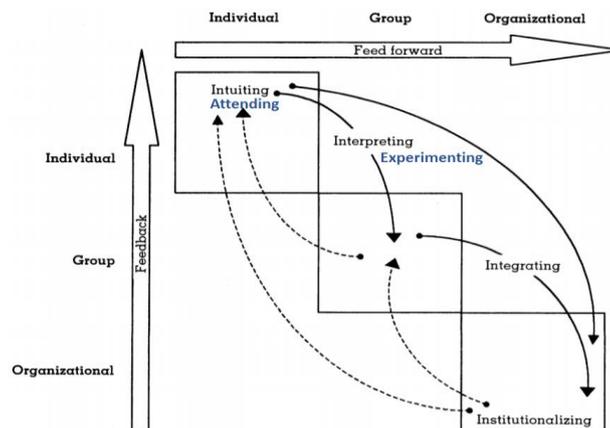


Figure 1 The extended organisational learning framework adapted from [20]

Crowdsourcing may contribute to the socio-political dimension of organisational learning. The “ambient organisational learning” framework, illustrated as a pyramid, is based on crowdsourcing as a form of organisational learning [4]. It is based on the 4I

framework of organisational learning [19], and can be relevant for in-house crowdsourcing. The framework illustrates traditional organisational learning with IT involving organisational members, while organisational learning with crowdsourcing with non-members are illustrated on the sides, with IT as an enabler. See fig 2.

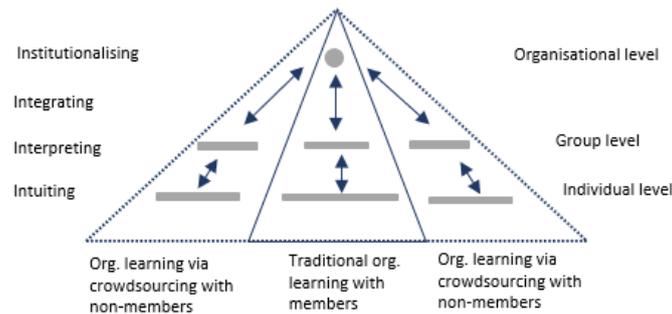


Figure 2 Ambient organisational learning framework adapted from [4]

In this setting, crowd members are intuiting when they individually develop ideas. Interpreting refers to explication, collaboration, discussions, and selection of ideas through a digital technology. Integration includes feed forwarding of ideas and interpretation to the core organisation, evaluation of ideas, and feedback of the outcomes back to the crowd. Institutionalisation of learning from crowdsourcing involves new practices being established in the organisations as a result of crowd-based learning and crowd-developed solutions. Feed forward refers to expressing ideas (illustrated as upward arrows in the figure) and feedback refers to receiving reactions and feedback of the learning process (the downwards arrows in the figure) [4].

### 3. Research Context and Methodology

The research context is an intercorporate and multidisciplinary research and development project where interactive technologies are used to enhance experience sharing among employees in an organisation to cultivate and nurture the organisational culture. Interactive technologies are used to bring forth the employees' experiences and concerns related to their daily work to facilitate the exchange of experience and knowledge within an organisation with the intention of changing people's mindset and affecting their behaviours. The aim is to use interactive technologies combined with new principles for management and governance to create a positive change in the organisational culture. The overall research approach for the project is Action Research to address questions and key issues in communities or organisations [22]. The project context has provided us the basis and opportunities to explore innovative ways to engage employees, facilitate experience and knowledge sharing and learning at the individual, group, and organisational levels, and obtain feedback from the users. For this paper, we have used scenarios as a methodology to challenge existing assumptions and to identify novel lines of inquiry [23]. Scenarios of how humans interact with

technologies have been identified as a means of understanding the interactions and how the technologies are used, supporting the design of artefacts [24]. Scenarios can be abstract, yet specific, and they provide the flexibility that is required to explore the design space, engaging the potential users in a participatory process prior to implementing the technology. Furthermore, inspired by the work of Shirani et al. [25], we have enhanced our ICULT framework [1], and the design of the technologies by exploring synchronous and asynchronous group communication, and by investigating how crowdsourcing could enhance learning in such settings. In addition to the inspirations from theory, the specific scenarios described in this paper were also inspired by discussions in a workshop with the project partners, followed by a journey mapping and a session of Crazy Eights [26].

#### **4. Organisational Learning Using Interactive Technology: ICULT Framework**

The conceptual framework ICULT was designed to guide and enhance the use of interactive learning technologies to support organisational learning to improve organisational culture [1]. The framework can also provide guidance for interactive and collaborative organisational processes where the aim is for individual employees to collaborate and reflect on dilemmas and their beliefs and values, and to think beyond time-bound and planned group activities. The framework addresses learning in three levels: individual, group and organisation. The framework was proposed during the COVID-19 pandemic-related lockdown period in 2020. It was inspired by the need to support not only collaboration among the employees within an organisation, but also the need for organisations to ensure the health and well-being of their employees and to promote an organisational culture that ensures the engagement of its employees at all levels. Moreover, the increasing need for digital interactive technologies were identified and hence, the design of the conceptual framework has been inspired by the need to support the experience sharing and learning processes within organisations where digital technologies played a significant role in enabling and enhancing the learning processes at the individual, group, and organisational levels.

The ICULT framework consists of five steps and is shown in Figure 3. The five steps are 1) initiation, 2) using the technology in planned group events, 3) knowledge sharing, 4) interpretation, and 5) actions. Step 1 in the framework is initiating and planning an event, such as a time-bound and physical workshop. Such an event would normally include several participants such as a group of people. This step may be initiated and conducted by a team manager or the human resource manager. The planning of such events would include determining the aim of the event, the potential participants, expected outcome and eventually how the outcome(s) would be used for the benefit of the organisation as a whole as well as the individuals and the groups. Step 2 is the actual event planned in step 1 which could be considered as synchronous engagement and crowdsourcing experiences from all participants to enhance individual and group level learning through sharing experiences and ideas and discussions. Step 2 is likely to start a reflection process for the participants, which can continue beyond the time and space

of a workshop and can lead to discussions and new ideas and Step 3 describes this. Step 4 is when the organisation, which could be a group or higher-level management, receives the input from the types of activities related to Step 3 and interprets and reflects upon them to decide what actions to take, when and how, in Step 5 [1]. The scenarios described in Section 5 illustrate these steps in more detail.

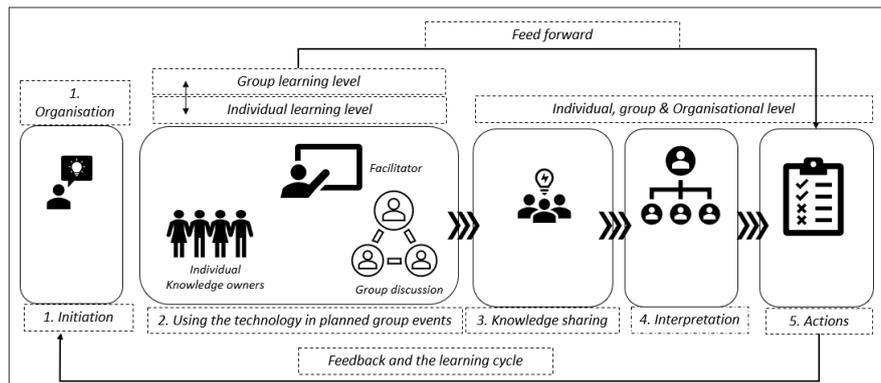


Figure 3 ICULT Framework adapted from [1]

The individual processes in Step 2 of the ICULT framework can be considered as the intuiting process identified in the 4I framework [19], shown in Figures 1 and 2. Similarly, one way of considering learning at the organisation level can be the institutionalisation of knowledge and when, for example, a procedure or practice, becomes a part of the institution rather than within a specific group. Causal connections within the planned events, such as facilitated workshops in Step 2, are important for organisational learning [10]. The feedback loop in the 4I framework, from the organisation to the individual, indicates this. Similarly, the ICULT framework describes recurring learning processes within an organisation, where the knowledge from step 5 must impact the individuals, thus should influence the activities and contents of steps 1 and 2. This is well aligned with the work we have conducted so far in the project, where we have focused on experience sharing workshops among groups of employees, initiated and led by facilitators (step 1 and 2) and how the learning outcomes from such time-bound and physical workshops could be communicated and provide value to the rest of the organisation (step 5). Steps 1 and 2 are currently supported by an interactive technology that crowdsources contributions from individual participants during the workshops. These contributions are used as the basis for reflections and discussions during the workshop as well as to provide a valuable source of information for the organisation to take future action, to meet the needs of the employees and foster organisational change in the future. The contributions are currently in the form of concerns or issues experienced by the participants, structured as dilemmas, and the possible means of resolving these situations [1].

## **5. Crowdsourcing Scenarios**

Literature emphasises the need for considering several types of processes for successful organisational learning, such as cognitive processes [19], socio-political processes [21] and activities [20]. Crowdsourcing through interactive technologies offers new opportunities for organisations to design activities that can engage and motivate employees and include them in their decision-making processes. Engaging and motivating people to contribute and share their ideas can be challenging. Since people will contribute according to their motivation, selection and implementation of incentive mechanisms is important [2]. In-house crowdsourcing can be strengthened with influencing factors such as the feeling of accomplishment, money, gratitude, feedback, processing time, and the role of the supervisors [6].

In the following sub-sections, we describe two crowdsourcing scenarios to illustrate how crowdsourcing and interactive digital technologies can be used to engage and motivate employees both within and beyond time-bound events to support organisational learning. The scenarios are also designed to illustrate the synergies among the different steps in the ICULT framework and to inform the design of technologies.

### **5.1 Scenario 1 – Enhancing time-bound workshops with synchronous crowdsourced communication and collaboration**

The first scenario is based on engaging the participants in step 2 of the ICULT framework, e.g., during a time and space-bound workshop, by sharing and contributing their experiences and knowledge, engaging in the discussions and reflections as well as contributing to the definition of the outcomes from the workshop and actions that could be taken after the workshop. The focus is on crowdsourcing contributions from the participants to shape the outcomes and actions. The actions form a part of the interface from the workshop to the rest of the organisation, and links step 2, 3, 4 and 5 in the ICULT framework. In particular, such an activity will help to bridge steps 2 and 5, enabling the feed forward process described by Crossan et al. [19]. This scenario can benefit from crowdsourcing and synchronous participation and sharing of experiences within the time and space bound workshops. Organisations often conduct facilitated workshops to identify employees' concerns, share experiences and reflect upon issues that concern many. The need for determining the relevant content for the discussion during these workshops, which will also engage and motivate the participants, can often be a challenge for the workshop facilitators. Using interactive technologies lowers the barriers for contribution and provides opportunities for everyone to contribute, which may otherwise be hindered due to time constraints or the socio-dynamics of the group. Three ways crowdsourcing, supported by interactive and shared technologies, could enhance the quality of a workshop and its outcomes, and contribute to accelerate the feed forward process from step 2 to 5 of the ICULT framework are illustrated in Figure 4, and described in the rest of this section.

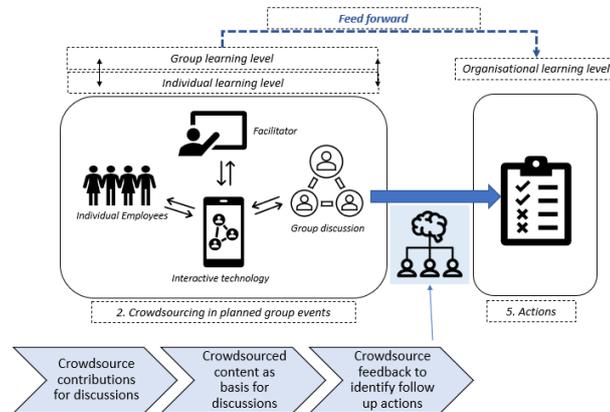


Figure 4 Synchronous crowdsourcing to enhance group events in the ICULT framework adapted from [1]

*Crowdsource participants' contributions to highlight and enrich the topics for discussion during the workshop:* The goals here are to engage and motivate the participants and to ensure that the issues discussed are relevant to the participants. Contributions from the workshop participants, who are individual employees, are crowdsourced by inviting them to share their own experiences related to the topic in a facilitated and time bound workshop. This is done using interactive technologies such as a mobile application, where participants could provide their input in a structured manner. The crowdsourced contributions are then shared with all the participants via interactive and/or shared technologies such as a shared screen, mobile or web-based application, or indeed a blend of several such interactive technologies. This crowdsourced content could form the basis for a group discussion.

*Crowdsource participants' contributions during facilitated group discussion for in-depth interactions:* The goals here are to support a facilitator in the process by giving input to adjust the dialogue accordingly and to provide a platform for the participants who may not be comfortable to share their thoughts and ideas. During a facilitated group discussion, the participants can contribute their thoughts, ideas, and opinions through technology on a presentation screen, in real-time. This could provide for a more dynamic and inclusive dialogue in a facilitated group discussion, for example, by giving all participants a platform to share their thoughts and ideas, e.g., by adding comments, emojis or by selecting or rating contributions. The contributions could be made visible to all participants, e.g., through a shared presentation screen.

*Crowdsource participant's contributions after facilitated group discussion for an updated abstraction of knowledge and the identification of follow-up actions:* The goal here is to ensure that the voices of the participants and their reflections based on the discussions in the workshop are captured and could have an impact beyond the time- and space bound workshop. After a group discussion and as part of the wrap-up of a workshop, the participants could send their contributions through the technology based

on the shared experiences and knowledge created during the group discussion. Enabling participants to reflect upon the knowledge that has been shared and give their individual contribution through the technology, e.g., by rating which topic to work on in the next workshop, select an experience that could be relevant for other parts of the organisation, or by contributing to a workshop summary that will be shared with the management.

This scenario represents a synchronous way of using the interactive technology for knowledge sharing and learning. Here, the feed forward loop starts with learning at an individual level through intuition and attending with employees learning about the topic, sharing their experiences through the technology for co-workers to see and reflect upon as well as selecting between possible solutions to situations that have been expressed and shared in the digital platform (intuition). In this scenario, employees actively explore the other co-workers' contributions and absorb their ideas (attending). The learning process then builds further to the group and organisational level through interpretation and integration in facilitated group discussions. To enable experimentation of new learning and to accelerate the process from step 2 to step 5 in the ICULT framework, the system could have supporting functions, e.g., access to a personal diary where employees can register change of practice afterwards or an action plan based on the group discussion. Reports with summaries of lessons learnt and targeted sharing of learning outcomes that should be addressed by the top management can contribute to the institutionalisation process. Further, it's important to develop functionalities and incorporate mechanisms that create a good feedback loop by enabling utilisation of the knowledge and to guide how the employees think and act.

## **5.2 Scenario 2 - Beyond time-bound workshops using asynchronous engagement and crowdsourcing**

The second scenario focuses beyond the time-bound workshop (in step 2) and on how the outcomes from a time and space-bound workshop, as described in scenario 1, could be used to create value for the organisation, by further engaging the individual employees, i.e., the feedback loop as Crossan et al. [19] describes it. The workshop is an event or an experience that could trigger reflection among the individual participants which could lead to additional feedback and ideas, which may surface after the workshops (e.g., experiential learning described by Kolb [13]). Furthermore, the outcomes from the crowdsourcing activities in the workshops in step 2 of ICULT could be shared with other individuals and groups within the organisation, as knowledge sharing and interpreting activities, which are described by steps 3 and 4 of the ICULT framework. In this scenario, the process is initiated by the management by selecting a relevant topic to be crowdsourced. By using digital shared screens in common shared spaces (e.g., in the hallways) and/or digital information platforms (e.g., social media platforms at the workplace such as Yammer), the participants are invited to contribute. The employees can choose to participate in a less controlled and facilitated way compared to scenario 1, which might make it more challenging to recruit participants. This might require more work on the design of the invitation to the employees and the visualisation of the process to raise awareness and to encourage employee participation.

However, by designing the concept in ways where it is easy, fun, and not time-consuming to participate, this may be an efficient method to engage more employees compared to selecting some employees to participate in time-bound workshops.

In step 5 of the ICULT framework, the organisation may decide that the outcome from one or more of the events in step 2 could be shared with a broader range of participants from the organisation and their ideas, experiences and feedback could enhance the organisational learning. Thus, activities in step 5 could trigger activities in steps 3 and 4, through diverse crowdsourcing activities as shown in Figure 5 and these are described in the rest of this section.

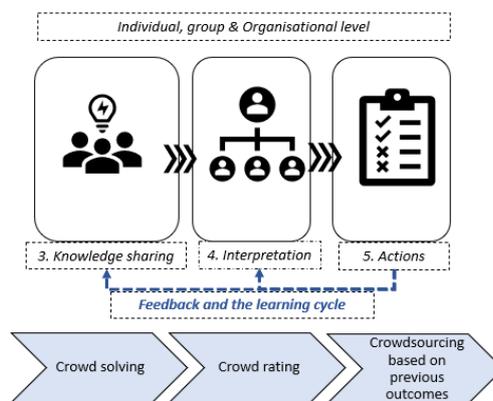


Figure 5 Asynchronous crowdsourcing in the ICULT framework adapted from [1]

*Crowdsourcing through crowd solving:* The goal is to find the best possible solution to one or more issues by involving employees to propose solutions. Here, the employees can contribute by suggesting solutions to an issue. The proposed solutions are shared with all (or selected) employees through interactive technologies. Sharing the crowdsourced proposals for a solution could promote reflection among the employees, stimulate engagement and motivation to contribute, and prompt employees to contribute and share their ideas with the organisation.

*Crowd rating of crowdsourced issues and possible solutions:* The goal is to obtain employees' feedback before a solution is decided upon or to determine which actions or solutions are preferred by the employees. Employees could be invited to rate the crowd solved proposed solutions, i.e., crowd rate the proposed solutions. The outcome of the ratings can be shown on a shared digital display screen, in real-time, to communicate the solution options and the preferences of the employees, and to provide instant feedback to the crowd. Through crowd rating, the most preferred solutions, with the most votes, at any point in time could be displayed more prominently.

*Crowdsourcing through co-creation of content.* The goal is to foster an organisational culture where engaged and motivated employees share their views. Here, the employees can contribute with their own ideas, experiences, concerns, issues, and solutions as contributions, outside of formalised events, such as the time-bound and physical workshops described in scenario 1 (step 2 of ICULT).

This scenario represents an asynchronous way of using interactive technology for knowledge sharing and learning. Here, individual level learning occurs by reading a specific task to be solved and by selecting between different suggestions through crowd rating (intuition and attending). Group communication will not be facilitated directly, it will happen through technology and not necessarily simultaneously. However, showing results in real-time can lead to shared understanding and practice. Further, it might lead to participation and engagement that leads to formal and informal discussions about the topic. Since there is no facilitator to lead this process in real-time, it is important to consider how to store and visualise the contributions in a way that makes it easy to understand for both decision makers as well as the crowd. Also, since more employees can be involved, it might result in collecting a lot of information that needs to be evaluated, making the steps from 3-5 in the ICULT framework more complex.

### **5.3 Implications for Design**

The scenarios help to identify the different situations where crowdsourcing may be used and thus help to clarify the specific crowdsourcing activities and how they should be designed. They also inform the design of interactive technologies in many ways. It is important to determine what content can be shared with whom and when, and to provide the desired level of privacy and anonymity to the contributors. In some situations, it may be more effective with personal technologies such as a mobile device, where the contributors have their time and space to contribute and determine who they want to share their contributions with. Similarly, there are times when access to shared content in a timely manner may stimulate a wider group of participants to contribute, discussions and reflection processes across groups of individual employees or indeed express their preferences, thus influencing the decisions made by the organisation. The choice of synchronous and asynchronous activities also influences the choice of technologies. The scenarios that have been described in this paper highlight the need for blended interactive technologies ranging from personal technologies such as mobile devices to more ubiquitous technologies such as shared interactive displays, perhaps with QR codes or touch screens. Exploring the most appropriate technologies for the various synchronous and asynchronous organisational learning activities through crowdsourcing will be a part of our future work.

## **6. Concluding Remarks**

Learning in organisations take place at several levels which include individuals, groups, and the organisation itself. Studies show that insights and innovative ideas occur to individuals and not to organisations. Thus, there is a need to enhance experience and idea sharing as well as identify the concerns of individuals. This paper explores the role of in-house crowdsourcing and the design of interactive technologies for knowledge sharing and collaboration among individuals, groups, and the management within an organisation. This work enhances the ideas proposed in the

ICULT framework for organisational learning by focusing on knowledge sharing and leveraging on individual contributions via in-house crowdsourcing to enhance organisational learning. The main research contributions of this work are crowdsourcing scenarios that can support the design and development of interactive technologies for organisational learning.

The contributions of this paper are crowdsourcing scenarios that have informed the design of the technologies and pilot studies. We are currently developing the technological solution for the scenarios described in this paper and conducting studies in two organisations. One of the limitations of this work is the lack of empirical evidence through studies related to the scenarios. We are in the process of gathering data from an ongoing asynchronous pilot and we aim finish the evaluation within the year through a mixture of research methods such as semi structured interviews, questionnaires, and analysing data logs.

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