

Shared theoretical background and key concepts in MIRROR

White paper to be included in the deliverables D3.1, D4.1, D5.1, D6.1, D7.1 and D8.1

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Introduction

The purpose of this white paper is to **summarize our current understanding of reflection** in MIRROR and to provide a **common set of basic concepts to apply across the deliverables D3.1, D4.1, D5.1, D6.1, D7.1 and D8.1**. The text will be included in all these deliverables.

The document is based on continuous work in the first year of MIRROR to identify and agree on a shared set of concepts. The white paper does **not** include emerging theory based on the empirical work in MIRROR. The set of shared concepts will be refined over the course of the project.

The document starts with an outline of concepts related to the individual process of reflection, followed by a section on reflective learning on individual, collaborative and organizational levels. Next the concept of reflection session is elaborated, providing a link to the MIRROR requirements process and the storyboards with test bed specific requirements (to be documented in **D1.3**). Finally there is a section on the roles of tools in reflection, pointing towards the MIRROR design space.

The reflection process

Reflective learning refers to “those intellectual and affective activities in which individuals engage to explore their experiences in order to lead to new understandings and appreciations” (Boud et al. 1985). In MIRROR we base our understanding of the process of reflective learning on the model of Boud et al (1985), in which the learner re-evaluates past experience by attending to its various

aspects, thereby producing outcomes (Figure 1). This process is a core element in collaborative reflection and in organizational learning

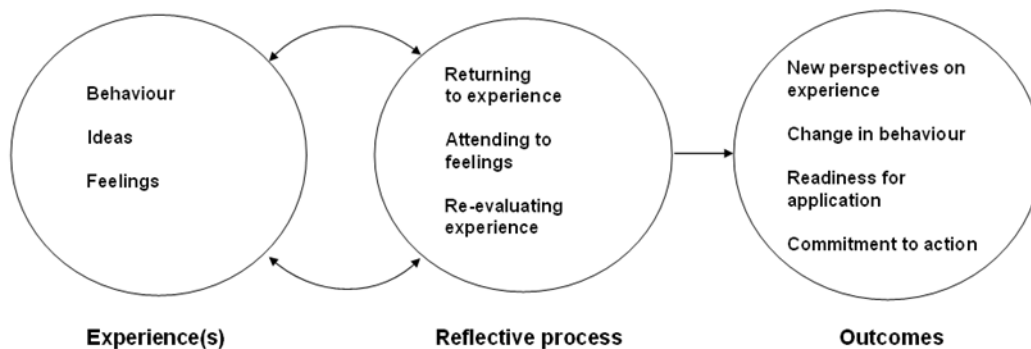


Figure 1: The process of reflective learning (Boud et al. 1985)

In everyday as well as academic language ‘**experience**’ refers both to single experiences (of specific events or situations) and general experience in the form of knowledge/skills/attitudes collected and developed over time. Also, experience can be seen as a continuous “flow” of which people can be more or less conscious.

In the reflective learning process (Figure 1) we can consider the experience returned to as a single experience or as a set of such single experiences. A **single experience** is defined as **the total response of a person to a situation**, including behavior, ideas and feelings. Given the differences between individuals, the experience of one and the same event will be different in different persons.

In the reflective process, the re-evaluation of experience requires generalization and abstraction from the concrete experiences as well as attention to their emotional aspects. The learners’ knowledge serves as a resource for – and outcome of - the re-evaluation.

The outcome of reflective learning can be cognitive, affective, and/or behavioural. A reflective process, through its outcome, always results in some “resolution”, even if the outcome does not necessarily have an immediate and/or measurable impact on the work practice in question. **For our purposes (in MIRROR) we consider reflection and reflective learning to be the same thing.**

A key aspect in making a reflective process happen is the presence of **triggers**. Triggers are unexpected situations (e.g. disturbances and perception of uncertainty, or positive situations like surprising success) creating awareness of discrepancy between expectations and the current experience. Reflection might be triggered by an external event or agent (external trigger/incident) or might develop from one’s own thinking (internal trigger/inner need to reflect).

Reflective learning on individual, collaborative and organizational levels

Reflection can take place **individually** and **collaboratively**. For reflection to be collaborative, the participants need to share experiences and relate to others’ experiences in their own reflection, resulting in a spiral-like interaction between individual and collaborative reflection. Collaborative reflection may be based on experiences of shared events and situations of collaboration between the participants, but also on individual experiences that are not related to the same events but are comparable through a **shared context** (e.g. experiences from similar, individual work tasks taking

place at different times and/or different locations). Individual and collaborative reflection has different advantages and can complement each other in workplace learning.

Reflective learning can also be viewed on the level of the organization. **Organizational learning**, an organization's improvement of its task performance over time (Argyris and Schön 1996), can be seen as a consequence of the learning taking place in individuals and teams in the organization in the context of their work, e.g. through a **bottom-up** learning process. Learning in an organization is also framed by the organization's **top-down** management of its processes, which may be more or less explicit about the role of informal learning and employees' reflection on work experience. Management in an organization may reflect on their own performance (and that of the organization) on the basis of data from the organization; this data may originate in processes of work but also in processes of reflection through which the employees share their ideas and views.

In workplace learning, reflection and **problem solving** can be seen as closely related and feeding into each other (D. Schön 1983).

The reflection session

By **reflection session** we refer to a time-limited activity framing and supporting processes of reflection. Reflection sessions range from the small, individual, spontaneous pause in between work tasks to the scheduled, elaborately organized and facilitated workshop in a team. Key **dimensions that can be used to characterize reflection sessions** are Objectives, Content, Process, Outcomes, Support, and Timing. These dimensions, to be elaborated below, are not completely independent.

Objectives

The objective(s) of a reflection session link the reflection to work processes. The objectives may be more or less explicit. Objectives can be characterized in more detail outlining whether they are on **individual, team and/or organization/management level**, in which **specific work/business processes** and the objective(s) originate (e.g. day-to-day needs of individual work practice, plan for individual competence development,..), to which **roles** they relate, and what are the **more specific goals** (e.g. related to sense making, problem solving, improvement or performance)

Content

By content we refer to 'the thing reflected upon'. The content can be characterized in more detail by outlining whether the reflection is addressing **individual experience and/or shared experience** (e.g. among the members of a work team), whether the reflection is addressing a **single experience** and/or a **set of experiences**, whether the reflection is concerned with **one work process** or issues that **span several work processes**, which work process(es) are in focus, and whether **other representations** of the relevant work practice (e.g. best practices, standards, simulations such as in a serious game) are being used in the re-evaluation of the experience

Process

This refers to how the activities in the reflection session are being conducted. These processes can be **individual and/or collaborative**.

Outcomes

This refers to the results of the reflection session, e.g. what is being produced, some of which may be planned and some unplanned. In characterizing the outcomes of a reflection session, the following

should be considered: Which **articulated knowledge** is developed/constructed (e.g. lessons learned, creative solutions, proposed changes to certain work processes, and refined/annotated/aggregated data from a work process), which **artifacts** are produced (e.g. reports and personal notes), to which **roles** and **processes** the outcomes are relevant, which knowledge and artifacts are intended to be **shared** (and with whom), and what are the actual **changes in work practices**

Support

This refers to support or **scaffolding** for reflection, which can be provided by a human coach/facilitator and/or by tools. Support can be characterized by the way **access to data** from the work process is being provided (subject to numerous considerations regarding availability, privacy, representation/presentation, sharing etc.) by the **roles in the reflection session** (e.g. is there a facilitator), by the **procedural support** (e.g. guidance through certain steps), by the support for **articulating and sharing knowledge** within the reflection session and in the creation of its outcomes, and by the specific techniques/approaches used (such as creativity techniques and **serious games**).

Timing

This refers to when the reflection session takes place, in particular how it is scheduled with respect to work processes. It also refers to the duration of the session. The timing can be characterized by outlining to what extent the reflection session is **separate from, or intertwined/concurrent with, the work process** (If reflection happens in frequent, small steps, e.g. in between work tasks, it may be convenient to consider these steps together as one reflection session), whether the session is a **pre-scheduled activity or initiated upon need or convenience**, and what are the **criteria and conditions for starting and terminating the session**. The start of a session may for instance be based on the learners' initiative (e.g. on the occurrence of a trigger for a reflective process) and/or on some form of prompting. The termination of the session may be based on time allocated/elapsed, the occurrence of certain events in the work process, the completion of certain outcomes, etc.

The roles of tools in reflection at work

Tools may have different roles in supporting reflection at work (Krogstie 2009). Two key categories of tool use are **gathering data from the work process** and **providing support for the reflection session**.

Tool support for a reflection session includes providing **access to data** from the work process. Some of this data may serve to trigger reflection, other data may be used to make sense of (recall, reconstruct) the experience(s) in question. Tool support for the reflection session may also take the form of **process guidance**, e.g. guide its steps. Further, tools may support the **articulation and sharing of knowledge** in a reflection session and in producing outcomes of value to the surrounding work and business processes.

Finally, in considering support for reflection we need to consider **tools that support the work process** more broadly, since tool use in day-to-day work and reflection may be closely intertwined and one may impact on the other.

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