An Action-oriented Understanding of Reflection

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Abstract

This paper explores commonalities in antecedents, context, process, outcomes, and techniques that foster action-oriented Reflection through the pragmatic methodological processing of reflection theories from Mezirow, Dewey, Schön, and Reflective Practice-based Learning.

Despite the widespread adoption of reflective practices across various fields of study and practice, reflection remains a complex and challenging concept to comprehend. One of the reasons why reflection is difficult to understand is that the scientific work around reflection has often focused on defining different conceptions of reflection using different semantics. When researchers study reflection, they tend to analyze definitions of reflection instead of focusing on the phenomenon of reflection itself. Semantically rooted definitions represent how we should act, and not necessarily what happens when reflection occurs.

Signs of actions in reflection across the theories and Reflective Practice-based Learning are analyzed and presented as a theoretical model for Action-oriented Reflection. The model visualizes the process from pre-reflective sensing to the effect of reflective actions.

Keywords

Reflection, Education, Reflective Practice-based Learning, Reflection-in-action

Introduction

Across research projects, it has been demonstrated that the ability to reflect does not develop unless the right preconditions are present in the

learning contexts. Reflective teaching grounded in an understanding of adult learning has a measurable impact on students' development (Chen, 2014). In Reflective Practice-based Learning (RPL), "reflection moves to the heart of the learning process as a means of creating the important connection between theory and practice…" (Horn et al., 2020), focusing on the development of professional practice through students' professional identity, judgement, and action competencies (Kjærgaard et al., 2021).

Although reflection is a central concept in professional education, its application within goal- and test-oriented educational discourses often reduces it to an assessment tool or individualized cognitive process. This instrumental use contradicts foundational epistemological perspectives from reflection theorists, who emphasize reflection to enhance perception and develop professional wisdom (Canning, 2011; Goh, 2019).

While reflection is widely recognized as essential to pedagogical development and adult learning, there is a notable lack of research into how reflection connects to action. This gap is paradoxical, as reflection is assumed to generate knowledge that informs and improves practice (Mälkki & Lindblom-Ylänne, 2012). An empirical study shows that although student teachers may report, respond, and relate reflectively, they often struggle to reason, reconstruct, and represent their reflections. The limited ability to articulate reflective processes hinders the development of meta-reflective competencies and affects their capacity to judge and act meaningfully in complex professional situations (Goldman & Grimbeek, 2015).

This leads to the scientific focus: How can we understand reflection through capturing what happens when we reflect to qualify professional actions (action-oriented reflection)?

The goal is to uncover how reflection can be understood in a learning context that connects experience, thinking, and action (Horn et al., 2020). This occurs through the integration of theory and empirical publications, drawing on insights from both theoretical and empirical analyses and resulting in a model for Action-oriented Reflection. The model is designed by extracting theoretical and empirical analysis of signs of reflective actions based on the condensed summary of Peirce's pragmatic methodology.

Pragmatic Methodology

The Pragmatic methodology aims to enable work across different ways of understanding and perceiving objects and the world. Here, disagreements often stem from various types of knowledge, differing purposes or interests, the attachment of different meanings to words (i.e., conflicting beliefs about what words mean), or from one or both sides in a disagreement using words without a clearly defined meaning (Peirce, 1982c). Although numerous definitions exist, these often prescribe how reflection should occur instead of capturing what happens when we reflect. It is challenging to act based on and apply reflection when we do not understand reflection (Peirce, 1982a). As presented above, the vague and ambiguous definition of reflection is a product of all these issues.

Peirce offers a pragmatic methodology for understanding complex phenomena, such as reflection, through simple heuristics for discovering and exploring knowledge (Peirce, 1982d). By sensing the phenomenon, getting ideas about these sensations, and establishing beliefs about what the phenomenon contains (conceptualization), we can develop beliefs, forming our habits we act upon (Peirce, 1982b). The meaning we assign to phenomena does not necessarily reflect the actual concept of the phenomenon; our conceptualization can be entirely incorrect, either due to a lack of knowledge as knowledge develops over time or because we have an interest in presenting the concept in a certain way (Peirce, 1982c).

The basic thesis for processing theory and empirical data is methodologically simple; nothing new can ever be learned by analyzing definitions, as these represent how we should act, not what happens in a given phenomenon (Peirce, 1982a).

Analytical framework

Building on these insights, observable signs offer a robust foundation for analysis. Peirce defines different types of signs emerging from 1) sensory impressions, 2) language (Peirce, 1982b), and 3) concrete actions (Peirce, 1982d). The signs play distinct roles. Sensory (or perception) signs provide the raw emotional and intuitive inputs, while language signs tend to oversimplify the inherent complexity of reflection. In contrast, action signs capture the specific behaviors and routines that embody reflection. This differentiation highlights the necessity of focusing on these tangible indicators to determine exactly when and how reflection occurs.

Complementing this approach, Peirce presents degrees of the signs' clarity. These degrees refine the analysis further. The first degree pertains to the logical, directly observable characteristics of reflection. The second degree abstracts these observations to define reflection more comprehensively by identifying inherent properties and excluding non-relevant aspects. The third degree assesses the practical effects resulting from reflective actions. Together, these insights culminate in the formulation of five essential analytical questions for the study.

Table 1: Analytical Questions

When does reflection occur? (Stimuli)	This question arises by pinpointing the specific stimuli—what is sensed—that trigger the reflective process (Peirce, 1982d).
How does reflection occur? (Action)	Here, the focus is on the actions—the observable behaviors and routines—that unfold as part of reflection (Peirce, 1982b).
What are the characteristics of reflection? (1. degree of Clarity, provided by the Action Signs)	In answering this, the study identifies the basic, factual traits of reflection that remain constant across contexts (Peirce, 1982c; Peirce, 1982b).
What are the properties of reflection? (2. degree of Clarity, provided by the Action Signs)	This question delves deeper by exploring the inherent features (Peirce, 1982b) and their oppositions (Peirce, 1982b), thereby providing a more abstract definition.
What are the effects of reflection? (3. degree of Clarity, provided by the Action Signs)	Finally, the analysis examines the outcomes produced by reflective actions and how these effects manifest in practice (Peirce, 1982b).

These questions are derived by mapping the stages of perception, thought, and action central to Peirce's pragmatic framework. They provide a structured way to differentiate between the observable processes and the abstract conceptualizations of reflection. By analyzing reflection theories and the data about RPL through these five questions, the methodology captures the dynamic interplay in reflection. It ensures that the model developed is both practical and testable. This approach enables a reflective and iterative process, where theoretical insights and empirical observations continually inform and refine our understanding of reflection in professional learning contexts. The pragmatic methodology

is a reflective tool (Peirce, 1982a) that can help the curious individual understand reflection and its mechanisms. This description includes an important time aspect: from the first verbalization of reflection as a phenomenon to the current conceptualizations that exist, a couple of thousand years have already passed. A final conceptual clarity of reflection has still not been achieved; achieving this clarity takes a considerable amount of time because we assign meaning to the world and phenomena when we sense them, often without thinking about where ideas regarding reflection are grounded (Peirce, 1982b).

Reflective Practice-Based Learning

The empirical component draws on data from the case study of RPL at University College Nordjylland (UCN) from 2013 to 2019. The data outline reflection in the educational settings of UCN before the organizational Program for Reflective Practice-based Learning published the "Whitepaper on Reflective Practice-based Learning" (Horn et al., 2020).

Between 2013 and 2018, RPL was loosely defined across organizational perspectives, philosophical questions, and pedagogical ideas. This loose definition led to a more diverse and less scientific approach to RPL, with a range of contributors publishing about RPL with less alignment in theoretical stance.

The publications about RPL after 2019 follow a narrower theoretical definition of reflection, all based on a cognitive understanding of reflection aligned with the presentation of theories and/or principles for learning and teaching as defined in the White Paper. The most significant publications on reflection after 2019 are Kirkegaard (2021), Bundgaard et al. (2023), Kjærgaard & Andersen (2023), and Gyldendahl, Georgsen & Dau (2023). These publications contribute in their way to the understanding of reflection in education, through the theoretical mapping of reflection and educational research that involves reflection. However, none of the publications define fundamentally different actions linked to reflection in RPL. Therefore, no new empirical analysis has been conducted. Instead, this paper positions itself as a contribution to reflection in RPL, drawing on publications from 2013 to 2019, with an emphasis on the following points from RPL after 2019.

In "Whitepaper on Reflective Practice-based Learning" (Horn, 2020), reflection is presented in learning contexts as learning to act in specific

ways in professional practice and, at the same time, being able to argue for the motivations behind the actions. The emphasis on actions as key to reflection in learning contexts continues in "Theory and Practice in Professional Educational Didactics" (Kirkegaard, 2021). Here, various reflection theories are presented in an educational context, with a focus on action. The abstract and intangible nature of reflection, also presented in this publication, underlines that reflection is difficult to understand clearly and distinctly. The phenomenon of reflection maintains its mysterious and indefinable conceptualization in RPL despite the publication offering one commonality across the many types of reflection presented: "…but what is common to all is that they emphasize how what has been learned can be applied in new situations in practice." Based on these two publications centered on reflection in RPL, reflection in professional educational contexts involves applying knowledge through argumentation and action.

The empirical processing

The empirical data consists of material from 120 units available in UCN's internal database or accessed through UCN's former Director of Education, Peter Møller Pedersen. Empirical material processed range from a special issue on Reflective Practice-based Learning in Cepra-Striben (Bjerre, et al. 2016), books (Dau, 2018; Pjengaard, 2018), communication materials (UCN, 2015a), video materials ranging from advertisements for individual programs to interviews with internal and external researchers (Professionshøjskolen UCN, 2016a; Professionshøjskolen UCN, 2016b; Professionshøjskolen UCN, 2017), documents related to projects on Reflective Practice Learning (Sørensen & Nielsen, 2018), PowerPoints and meeting minutes (UCN, 2015c; Dau, 2016b), UCN's institutional accreditation from 2017, strategic documents (Kirkegaard, 2018) and the draft for "Whitepaper on Reflective Practice-based Learning" (Horn, et al. 2019). This data set represents the documented attempt to define a pedagogical framework for adult learning in higher education outside the universities. Since Reflective Practice-based Learning has been incorporated as part of the pedagogical-didactic basis at several other educational institutions in Denmark (DMJX, CPH Business), the data is somewhat generalizable beyond the UCN setting.

Table 2: Search Protocol Reflective Practice-Based Learning

1. Define your research subject and describe the specific focus of the performed search:	2. List the aspects that your subject contains and the search terms for each of the aspects:		
"What has been written so far about Reflective Practice-based Learning at UCN? The focus is: Reflective Practice-based Learning.	Aspect 1 Refleksiv praksislæring/Reflective Practice-based Learning	Aspect 2 RPL	Aspect 3 Læringstilgang

3. Define your inclusion and exclusion criteria (both formal characteristics (e.g., study design, language, year) and content-related considerations)	
Inclusion criteria	Publication year 20013-2018 Language: Danish and English
Exclusion criteria	All documents where Reflective Practice-based Learning or RPL is not mentioned or is not described.

5. Search Results		
Source	Number of results and number of relevant results in parentheses	Date of performed search
UCN Intern	194 (120)	15/11-2018

4. The performed searches		
Source	Search query (paste your exact query from the searched source to include field codes in the search query)	Limitations (year, publication type, peer reviewed...)
UCN Intern	Refleksiv praksislæring OR RPL OR Reflective Practice-based Learning OR Læringstilgang	Publication year 2012-2018

The empirical data have since been processed through three condensations.

1. The empirical material for this paper is drawn from 97 pages of primary data on RPL. In the initial review, conducted in November and December 2018, passages explicitly addressing Reflection were identified.

2. Methodologically, the first review involved screening the full dataset to locate instances where the concept of Reflection appeared beyond the adjectival use of "reflective" in "Reflective Practice-based Learning."

3. In the second review—the basis for the present analysis—only those passages explicitly related to Reflection's action signs (meaning passages that can answer one of the five analytical questions described in the analytical framework) were retained.

This systematic approach excluded all material not directly concerning RPL, Reflection, and its action signs. Passages without identifiable action signs concerning Reflection were deemed unsuitable for understanding Reflection in RPL. While the broader RPL material contains various

conceptualizations of Reflection, these were excluded from the case unless explicitly connected to RPL as presented in Table 3.

Table 3: Empirical Action Signs Categorized by the Analytical Questions

When does Reflection occur? (Stimuli)
– When we start doing something, when we begin working with the material, engaging in teaching, and trying things out, we discover what we know (Professionshøjskolen UCN, 2016b, t. 11.02–11.23) – Learning to understand and accept one's own and others' defense mechanisms (Pjengaard, 2016c, s. 23) – When we experiment and try – Focus placed on experiences and/or practical encounters (Horn et al., 2019, s. 16)
How does Reflection occur? (Action)
– Taking ownership of our professional practice, critically examining our own learning, experiences, knowledge, and practice (Haastrup & Knudsen, 2016, s. 89) – Watching ourselves and others on video, noticing the small important details that can be applied in real professional settings, articulating what we do (UCN, 2015a, P4) – Using portfolios, logbooks, feedback, self-regulation, and systematic reflection exercises – Facilitating both a systematic reflection process, professional summaries, descriptions of learning outcomes, and feedback (UCN, 2015a, P1) – Acquiring professional knowledge at a higher level of abstraction than immediate practice- Being prepared by participating actively, using active listening, applying professional terminology, engaging critically (Næsby, 2016, s. 49) – Being thoughtful, evaluative, and assessing ourselves and our professional performance in relation to the profession and others – Turning other and past situations into mental and bodily representations that can be consciously recalled (Dau, 2016a, s. 70) – Interpreting interpretations (both the interpreter's and the interpreted's perspectives) (Næsby, 2016, s. 44) – Being influenced by interaction with the environment, including other people (Dau, 2016b, s. 2) – Challenging classical stimulus-response patterns and creating new meanings between stimuli and responses (Pjengaard, 2016c, s. 21+22) – Engaging ourselves in interdisciplinary contexts (Professionshøjskolen UCN, 2016a, t. 5.55–6.20) – Being argumentative, professional, and objective in our identity (Professionshøjskolen UCN, 2017, t. 1.15–1.28) – Structuring cognitively and metacognitively (Dau, 2018, s. 35) – Experimenting and testing the implications of actions (Horn et al., 2019, s. 16)
Characteristics of Reflection (1. degree of Clarity, provided by the Action Signs)
– Tackling challenges in our work with a kind of improvisation, challenging and developing practice – Seeing multiple and different aspects of the same issue, aligning expectations, setting clear goals, making the learning process visible (Næsby, 2016, s. 50) – Questioning concepts and models, questioning the conceptual framework present- Interpreting one's own and others' defense mechanisms – Reading not only between the lines but behind the lines to understand actions in practice (Pjengaard, 2016c, s. 22)

– Observation, abstract conceptualization, active experimentation, and thinking as an integrated circular process (Dau, 2016a, s. 72) – Linking experiences with conscious applications (Pjengaard, 2016a, s. 5) – Thinking beyond practice familiarity while being able to analyze and discuss it on a general and explicit knowledge basis (Bjerre, 2016, s. 39) – Progressive professional competence, meaning-making from experience to deeper understanding through interaction with others – Investigative processes and an element of critical thinking and metacognition- Being reflective human beings- Bridging theory and practice (Dau, 2016b, s. 4)

Properties of Reflection (2. degree of Clarity, provided by the Action Signs)

To be innovative, independent, and productive in the labor market; to think in terms of new solutions (UCN, 2015c) – the development of ourselves as individuals (UCN, 2015c) – Relating to oneself, taking responsibility for existence, entering into presence with others, understanding others' perspectives with empathy and self-awareness (Pjengaard, 2016d, s. 30) – stimulus and response are in a complementary relationship that emphasizes the individual's inner reflexivity and the group's dynamic co-creation and reflections; this complementarity distinguishes the approach from the most radical behaviorist theories (Pjengaard, 2016d, s. 33+34) – it provides meaning to why we should invest effort in learning (Pjengaard, 2016c, s. 19) – distancing ourselves from practice, rising above it, and socializing and mediating (Bjerre, 2016. s. 38+39) – exercising professional judgment that enables us to manage a given practice (Dau, 2016a, s. 75) – learning and independently and in collaboration with others developing and shaping our professional identity, our professional competencies, and our personal judgment (Pjengaard, 2016a, s. 6) – an integrative way of thinking that involves multiperspectivity or shifting positions (Pjengaard, 2016d, s. 34) – assessing whether a method, a concept, or a development project is beneficial for practice and the target group, and evaluating how and why and for whom it should be implemented (Næsby, 2016, s. 43) – critical examination of one's own learning, prior assumptions, knowledge, and practice (Næsby, 2016, s. 44) – mirroring what has been observed, recognizing what has been observed, referring to oneself, distinguishing between thinking about something, processing information, and communicating it (Næsby, 2016, s. 45) – we must not do too little (Professionshøjskolen UCN, 2016b, t. 10.44–11.00) – developing through an ongoing dialogue – making intelligent decisions (Kirkegaard, 2018, s. 1)

Effects of Reflection (3. degree of Clarity, provided by the Action Signs)

– Silent, bodily, social, mental/cognitive horizontal and vertical, and identity-developing activities – Differentiating between learning perspectives without fully separating or detaching them, using perspectives integratively and pluralistically (Pjengaard, 2016b, s. 17) – Learning together in and from practice – Seeing ourselves within the profession, mastering strategies, understanding the complexity of the profession, and acquiring relevant professional competencies (Pjengaard, 2016a, s. 6) – Developing ethical judgment based on knowledge, sensation, and experience (Dau, 2016a, s. 77)

– Taking ownership of our professional practice, bringing our personal values and identity into play (Næsby, 2016, s. 44) – Creating progress after reflection, deciding whether to move forward or step back (Professionshøjskolen UCN, 2016b, t. 10.23–10.35) – Contributing ideas from our own position, suggesting solutions, enhancing understanding of dynamics and challenges (Professionshøjskolen UCN, 2016a, t. 4.27–5.24) – Ensuring authentic reflection, Avoiding the blending of theory and practice, Developing reflective skills, changing perceptions, translating everyday concepts into scientific concepts- Providing a professional foundation for engaging with practice – Developing craftsmanship competencies, Applying knowledge, techniques, and reflection through practical expertise, Establishing synthesized understandings (Bjerre, 2016, s. 40+41) – Providing guiding principles for practice- Experiences from practice contributing to innovative solutions that make a difference (Pjengaard, 2018, s. 323) – Expanding reflective repertoires and shaping creativity (Næsby, 2016 s. 43) Developing and strengthening professionalism, being thoughtful and evaluative regarding practice and learning (Næsby, 2016, s. 43) – Understanding how different levels affect the ability to reflect, tell and mirror events or practices, integrate knowledge, and use it as practical skills in context (Kirkegaard, 2016, s. 84) – Seeing multiple and different aspects of an issue – Further developing the profession, associated learning, and identity understanding (Sørensen & Nielsen, 2018 s. 2) – Changing actions and finding new forms over time – Engaging in dialogue with tasks- Describing and explaining actions, collaborating to develop practice – Experimenting and testing the implications of actions – Always relating actions to both the external environment and ourselves (Horn et al., 2019, s. 16)

The empirical data approach reflection through similar conceptual lenses as those presented in the theories below. While it reflects a somewhat dualistic separation of theory and practice, it favors an integrative stance that seeks to dissolve this divide. In an educational context, the empirical material weaves together many of the theoretical insights, providing concrete tools and detailing learner interactions concerning the theories.

Reflection theories from Mezirow, Dewey, and Schön

The theoretical foundation of this study is grounded in dominant theories of reflection and learning, which are rooted in experiences, action, and thought, and philosophically informed by pragmatism. This study draws on the conceptual action signs analyzed in "How We Think" (Dewey, 1997), "Teaching Artistry Through Reflection-in-Action" in "Educating the Reflective Practitioner" (Schön, 1987), and "How Critical Reflection Triggers Transformative Learning" in "Fostering Critical Reflection in

Adulthood – A Guide to Transformative and Emancipatory Learning" (Mezirow, 1990).

The theoretical processing

The theoretical data have been analyzed and condensed twice. First, all sentences in the texts containing reflection have been marked. Next, only those passages explicitly related to Reflection's action signs (meaning passages that can answer one of the five analytical questions described in the analytical framework) were retained and categorized through the five methodology questions as presented in Table 4.

Table 4: Theoretical Action Signs Categorized by the Analytical Questions

When does Reflection occur? (Stimuli)		
Dewey	**Schön**	**Mezirow**
- An immediately experienced situation and its nature (problematic or confusing) - The impulse for exploration is awakened - Doubt, hesitation, confusion, or mental challenges - Spontaneous thoughts and ideas - Sensory perceptions - Feeling the problem's conditions - Memory - Past and future - Paralysis of action - Prior experiences - Lack of understanding; partial absence of meaning	- Knowledge-in-action - A surprising experience - Encountering surprise or wonder - A unique or uncertain situation - When we are somewhat conscious, even if not linguistically expressed - During developmental or challenging experiences	- Dilemmas and prior learning - Anomalies and dilemmas that do not make sense; trigger-events - The need to understand the meaning of our experiences
How does Reflection occur? (Action)		
Dewey	**Schön**	**Mezirow**
- We raise questions - Initiate ideas - Question our own habits - Turn themes of our habits upside down	- Construct our practice situations	- Interpreting dynamic interaction between meaning, habit, and an event - Mirroring and comparing an experience

- Subject themes to serious and coherent consideration - Engage ourselves in investigating what we do not understand - Choose to actively engage with experienced situations- Problematize experiences - Pursue knowledge and explore objectively - Examine grounds for opinions and perceptions - Investigate credibility, value, and intention of beliefs - Pose intellectual questions about what needs solving - Use spontaneous thoughts as guiding hypotheses - Initiate action based on inquiry to remove doubt and confusion - Process thought-states for possible solutions- Observe and assess the situation - Recognize the character of the situation - Engage with the facts - Test the value of indications - Examine guarantees supporting ideas- Think intellectually about prior ideas - Uncover relationships - Reason logically	*- Refer to sequences of operations and procedures, signs noticed, rules followed, and values, strategies, assumptions underlying "theories-in-use" - Question the assumed structure within knowledge-in-action; critical function - Learn to recognize and apply standard rules, facts, and operations - Make inferences from general rules to specific cases - Develop and test new forms of understanding and action*	*- Reviewing content or procedural assumptions - Checking if all relevant options for action are identified - Assessing consequences of alternative perceptions or hypotheses - Controlling variables- Using problem-solving methods - Carefully concluding based on evidence - Interpreting feedback from actions - Reflection before, during, and after decision-making - Examining the bias in problem framing - Focusing on procedures, methods, or premises - Subjecting ideas to rational and reflective discourse - Critically reviewing evidence and arguments - Withholding personal biases - Challenging established problem definitions - Critical review ensuring accurate identification of patterns and metaphors - Reevaluating assumptions underlying beliefs*
Characteristics of Reflection (1. degree of Clarity, provided by the Action Signs)		
Dewey	**Schön**	**Mezirow**
- Intellectual and practical commitment - Refers to situations - Mental elaboration of ideas or assumptions - Reasoning	- Reflecting after the surprising event - Pausing to reflect during the event - Reflecting mid-action - Transforming actions while acting - Integrated thinking and acting	- Validation of knowledge - Correction of distortions in reasoning and attitudes - Active interpretation of thoughtful action - Involves an element of critique- *Challenges the validity of prior learning assumptions*

- Identification of evidence through meanings and indications - Experimentation - Logical inference - Use of reason - Anchored in the reflectors' current context	*- Not necessarily relying on systematic consideration - Drawing on multiple insights simultaneously - Undergoing reflection without necessarily verbalizing it - Leads to rethinking parts of knowledge-in-action - Affects what we do*	*- Premise reflection - Concerned with "why"; the reasons and consequences behind actions - Reevaluation of problem framing - Reevaluation of personal orientations toward perceiving, knowing, believing, feeling, and acting*
Properties of Reflection (2. degree of Clarity, provided by the Action Signs)		
Dewey	**Schön**	**Mezirow**
Opposites: - Driven by impulses, unchecked desires, whims, or momentary circumstances - Insufficient critical assessment of ideas - Accepting that one thing indicates another without inquiry - Settling for familiar relations - Not using ideas for new observations Properties: - Inquiry and testing of facts and ideas - Investigating grounds for beliefs - Recognition of true meaning - Observation and judgment - Judgmental, understanding, and linguistic - Constructing purposeful and meaningful actions	Opposites: - Pushing surprise aside - Selective inattention - Reliance solely on knowledge-in-action Properties: - Critical function questioning assumptions - Thinking and acting - Learning new ways to apply existing competencies - Acting based on conclusions drawn from reflection - Thinking, learning, and acting integrated - Clear linguistic description of reflection-in-action - Reflecting on descriptions of reflection-in-action - Reflecting on phenomena and implicit understandings - Experimenting to generate new understandings	Opposites: - Rejecting perception and cognition - Escaping through defense mechanisms - Acting based on biases, distortions, and provincialism - Acting from past experiences without reassessment - Reflexive but not reflective behavior - Naive acceptance or rejection of validity claims Properties: - Judgment through stages of reflection - Immediate decision-making - Critical review of distorted assumptions - Evaluating why and how we perceive, think, feel, act - Reflection based on situation-specific "why" - Evaluation of implicit assumptions in beliefs - Integral to decision-making - Ex post facto critique - Reevaluation and potential transformation of meaning schemes - Challenging habitual expectations and perspectives - Accurate identification of patterns and metaphors in meaning frameworks

Effects of Reflection (3. degree of Clarity, provided by the Action Signs)		
Dewey	**Schön**	**Mezirow**
- Changing habits of action - Benefiting oneself and the world - Granting freedom - Influencing the future - Establishing lasting methodological habits - Modifying understanding of ideas - Leading to new actions - Providing practical applications of ideas - Generating action proposals - Courage to make mistakes	- Reconstructing strategies of action - Reconstructing understandings of phenomena and problems - Providing experimental approaches to new actions - Testing and confirming or rejecting tentative understandings - On-the-spot experiments influencing actions - Building and testing new categories of understanding and strategies - Challenging oneself critically - Uncovering tacit creative processes in practice - Shaping future actions - Developing new knowledge-in-action - Developing new theories or frameworks - Acquiring professional knowledge- Understanding uncertain situations - Effectively handling divergent situations in practice	- Correcting distortions in beliefs and reasoning - Reinterpreting to enable new actions - Critically questioning foundational assumptions - Discarding outdated knowledge- Reflecting back to assess prior learning validity - Deepening and strengthening frames of reference - Creating or transforming meaning schemes - Transforming nonviable perspectives - Acting based on transformed insights - Enabling transformative learning - Potentially changing social norms - Guiding better problem-solving strategies - Affecting how and why we act - Reorienting problem-solving efforts - Achieving perspective transformation - Developing critical awareness of limiting assumptions

Each theorist offers distinct but overlapping perspectives on the stimuli that initiate reflection, the actions through which reflection unfolds, the key characteristics and properties of reflective processes, and the effects on learning, action, and professional development.

Analysis

The analysis extracts and unfolds the key action signs from the empirical data and theories presented above. All sentences from the empirical data

and theories used in the following analysis are marked with cursive in Tables 3 and 4. The goal is to present a model of action-oriented reflection through simple prescriptions. The framework for the analysis is the three degrees of clarity. They provide a structured way to conceptualize action-oriented reflection across observable and basic traits – the "what is reflection", the more abstract inherent features – the "when and how to reach reflection", as well as the "effects of reflection".

1st Degree of Clarity: Characteristics and Actions of Reflection

Reflection is a **developmental circular process**. We **challenge** ideas, beliefs, and habits through **exploration, assessment**, and **testing** using our senses, thoughts, and actions to establish habits for action. Reflection has a beginning and an end, but one reflective conclusion can be followed by a new reflective start.

Through the reflective circular process (empirical data), we form ideas based on our interpretations (Mezirow, empirical data) of the dynamic interactions between meaning loss and our habits for action.

Understanding and actions challenged through exploration, assessment, and testing summarize the criteria for development to be characterized as reflective. These criteria highlight how reflection occurs, as we relate to multiple dimensions of the reflective process and challenge them. Challenging (empirical data, Schön, Mezirow) experiences, definitions, and patterns are a collective term for perspective shifts, questioning, and relating in the reflective process and summarize, along with development, the characteristics of reflection.

A central part of the exploration is questioning (Dewey, Schön, Mezirow, empirical data) what is happening/our experience, our habits/actions, and the assumed knowledge/thinking. We assess (empirical data, Dewey, Mezirow) the ideas formed, relating them to ourselves and the object of reflection across experiences, thinking, and actions. We test our ideas (empirical data, Schön, Dewey) throughout the exploration, combining acting and thinking to examine them. Engaging in tests confirms or refutes whether reflective-generated ideas contribute to understanding.

Development (Schön, empirical data) conceptualizes the process and goal of reflection. The process summarized by this term is a development across our interpretations of experiencing, thinking, and acting, both

alone and with others, as well as a description of our state of mind when reflecting.

Model condensation

This informs the model's layout: a circular developmental frame that flows towards new reflective processes with a defined beginning and end. Central to the reflective process is the challenging of ideas, beliefs, and habits. How to challenge these is outlined by the reflective actions: Exploration, assessment, and testing.

2nd Degree of Clarity: Properties and Conditions of Reflection

Reflection is **triggered** by **experiences** we can not make sense of. The reflection is conditioned by the complementary relationship between the **situated** experience, our **willingness to engage**, and **circumstances that foster examination**. In this process, i**deas, beliefs,** and **habits** are challenged to **develop understanding.** This enables us to **shift perspectives** to **establish, integrate,** and **evaluate** ideas, beliefs, and habits.

The state of us and our surroundings is as crucial as our capacity for reflective thought for reflection to be triggered (empirical data, Dewey, Schön, Mezirow, Peirce). Circumstances in our self and our surroundings influence the starting point for any reflection, making the properties of reflection situational (empirical data, Dewey, Schön, Mezirow) and placing the "when" of reflection outside cognition.

What we cannot make sense of refers to our need to construct meaningful actions (Dewey). The meanings we assign to a given context start as ideas (Peirce) that we examine. We gradually form beliefs (Peirce) about what we are trying to understand by sensing, acting in, and thinking about the world. Beliefs help frame the process by which we reestablish meaning (Dewey, Mezirow, empirical data), are the basis for our actions, and denote our habits of action (Peirce).

Trigger (Mezirow) is the comprehensive term for stimulus and response (empirical data), impulse (Dewey), sensory perceptions (Dewey), the somewhat conscious but not necessarily linguistically expressed experienced challenge (Schön), and the experience of not making sense and the need for making sense (Mezirow).

Actively engaging (Dewey, empirical data) with what we cannot understand refers to the starting point for how reflection occurs. This process can be either desire-based in the past or future (Peirce, Dewey) or

a necessity in the present (Peirce, Schön). "Willingness to engage" contains challenging one's own and others' learning, prior assumptions, knowledge, and practice (empirical data) as well as being open through inquiry (Dewey, Schön, Mezirow). Based on the challenge of developing understanding, we generate new insights (Peirce, Dewey, Mezirow, empirical data), developing our ability to shift perspectives (empirical data, Mezirow); establishing awareness that the conditions triggering reflection are not one-dimensional. This influences how we see the world and ourselves within it, allowing us to adopt perspectives beyond our own.

Integrating established ideas, beliefs, and habits possesses an evaluative property (Dewey, Mezirow, empirical data), combining assessments in the reflective process, both independently and in collaboration with others, develops and shapes our professional identity, competencies, and judgment (empirical data).

Model condensation

The conditions add a layer of situational context: when a trigger event is experienced. The conditions also inform how to reach reflection: through the individual/collective modus of willingness to engage and circumstances that foster examination. The conditions of reflection highlight that adopting perspectives beyond our own by shifting between acting, sensing, and thinking in the exploration, testing, and assessment of ideas, beliefs, and habits will shape our professional identity, competencies, and judgment.

3rd Degree of Clarity: Effects of Reflection

Reflection **changes habits** of action. It **develops** our ability to **understand coherence** between situations, our experiences, and different **ideas, beliefs,** and **habits** to **establish** or **evaluate actions.** The effect of reflection is to act as qualified as possible **over time.**

The third degree of clarity in reflection as a concept is its effect: understanding. Reflection results in actions based on understandings from the reflective process (Dewey, Schön, Mezirow, empirical evidence). Reflection affects how we interact with and engage in our surroundings. By challenging and examining one's own and others' interpretations of stimuli and actions, reflection determines how we behave and act in the future. Over time and through growing maturity, reflection enables us to validate actions through coherence (Dewey, Mezirow, empirical data)

in experience, thinking, and action across internal and external contexts and to a meta-level. All this to act effectively in practice (Schön). Coherence is processing many complex components, leading to understanding and acting as qualified as possible (Schön, Mezirow).

Based on the characteristics and properties of reflection and the added effect of coherence in reflection, four levels of reflection occur: 1) Challenge what is sensed to establish habits, 2) Challenging through shifting perspectives to develop habits, 3) Evaluating reflective habits to develop habits, 4) Developing the habit of sensing, thinking and acting in coherence while challenging habits in diverse situations in practice (Schön).

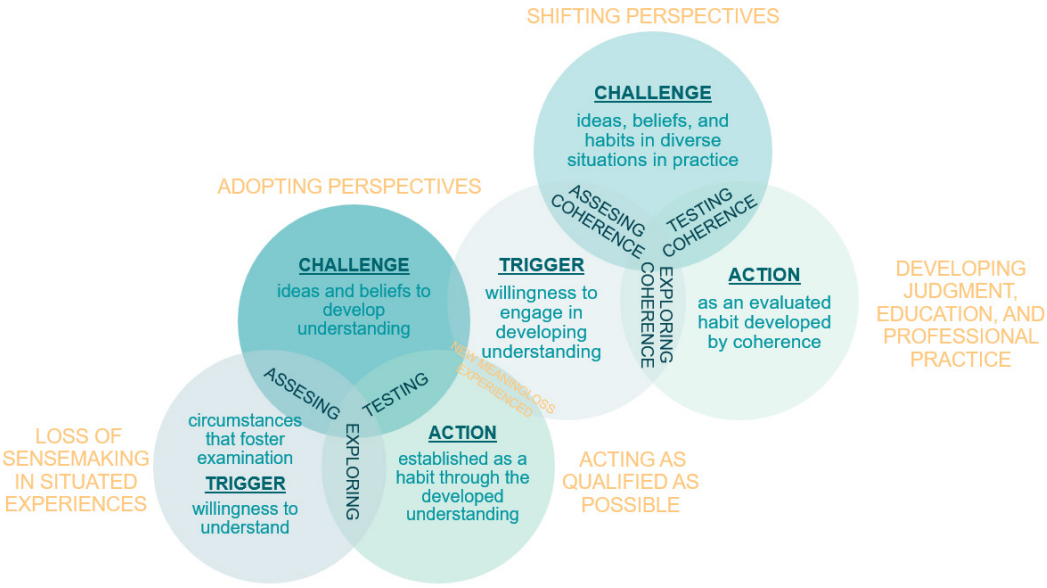
This means that reflection affects both a) individual reflective practice – the development of professional judgment and identity (empirical data), b) social understandings – for example, in educational contexts (empirical data, Dewey, Mezirow), and c) societal development – how we can qualify and develop professional practice through agency (empirical data, Schön, Mezirow). The effects of reflection in all three contexts are interdependent and develop each other. Common to all these effects is that, in practice, reflection affects how and why we act, think, and experience. Schön provides a fine formulation of the effects of reflection, including on itself: In reflection, we not only act based on already thought-out methods of consideration but also challenge and critically examine our reflection. Here, reflection has methodological, understanding-oriented, and action-oriented effects.

Model condensation

Adding the evaluation of habits to the model as a result of reflection marks the third level of the reflective process. Connecting two reflective processes visualizes the timely factor. Coherence will be implemented in the second reflective process to represent the fourth level of reflection. The effects of the circular process are the continuous development towards qualified judgment, education, and professional practice as the highest parameter for qualifying actions.

Model for Action-oriented Reflection

Model 1: Action-oriented Reflection



Conclusion

Understanding reflection and being able to reflect in higher education is a developmental process. To achieve reflection, we must foster circumstances that develop our willingness to understand and our ability to challenge the experiences, actions, or thoughts that trigger us. The suggestion that the emergence of reflection does not relate to a cognitive exercise is the most important finding in this paper. Both empirical data and the theories imply that reflection relies on both external and internal conditions being right. When these conditions are met, we can develop understanding through exploring, assessing, and testing by sensing, thinking, and acting. Along the way, several pathways can be integrated to attain different levels of reflection, always tracing a line that begins with the emergence of reflection and culminates in its effects. Reflection leads to the development of beliefs and habits of acting based on our reflective understanding. Not including empirical data on Reflective Practice-based Learning published after 2019 can be argued as a limita-

tion to the paper's validity. A triangulated analysis containing this data set and the data set from Gyldendahl Jensen, C., Georgsen, M., and Dau, S. (2023) would offer a more representative understanding of reflection across higher educational contexts.

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