



PROMISE

Professional Noticing to Improve
Entrepreneurship Education

State of the Art Review on Professional Noticing in Entrepreneurship

www.professionalnoticing.eu



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TABLE OF CONTENTS

01	Introduction	3
02	Search Method and Process	5
03	Professional Noticing	9
04	Entrepreneurship and Professional Noticing	18
05	Quantitative Analysis of Research History in “Professional Noticing”	27
06	Research Agenda	34
07	Bibliography	36

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By
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01

INTRODUCTION



INTRODUCTION



This semi-structured literature review was conducted for the PROMISE project by Isabell Grundschober (University for Continuing Education Krems, Austria) and Vesa Hautala (University Turku, Finland), supported by the PROMISE consortium and educational experts through feedback loops.

The goal of this deliverable is to understand the history of research on “professional noticing” as well research traditions of published articles, referring to “professional noticing” and to synthesize the state of knowledge of researchers on “professional noticing”. The deliverable identifies relevant theories and terminology connected to “professional noticing” and it outlines transversal aspects of “professional noticing”. The results of the semi-structured literature review give first insights on how “professional noticing” and entrepreneurial competence development are connected and how competence development could be reinforced through professional noticing. As an outlook for the next phase of the PROMISE project, an agenda for further research is suggested.

The aim of the state-of-the-art review is to develop a **common and current**

understanding and teaching of Professional Noticing, particularly as to **how it can apply to entrepreneurship teaching**. (PROMISE proposal, p. 45) Therefore, the state-of-the-art review is **the initial step** for the whole project. The proposal didn’t specify the methodology of the state-of-the art review, except that it could be done **online**, through **focus groups** or **consultation with entrepreneurship education stakeholders** (individuals with expertise in the field of entrepreneurship education and/or education sciences). (PROMISE proposal, p. 45).

The method of a **semi-systematic literature review** was chosen based on the scattered research on professional noticing in different disciplines and the lack of research on professional noticing in entrepreneurship competence development.



Unlocking the Power of Professional Noticing for Entrepreneurship Higher Education



02

SEARCH METHOD & PROCESS



SEARCH METHOD & PROCESS

A **semi-systematic literature review** was used, as professional noticing has been conceptualized differently by various groups in researchers within diverse disciplines.

To review every single article that could be relevant to the topic is not possible, since there are different terminologies used by different groups of researchers. (Snyder, 2019) Especially in entrepreneurship, there is no research on “professional noticing”, but research on connected theoretical frames.

Therefore, the goals of this

semi-systematic literature review are:

- to understand **the history of research on “professional noticing”** as well **research traditions** of published articles, referring to “professional noticing” (through quantitative analysis).
- to **synthesize the state of knowledge of researchers on “professional noticing”** (through content analysis).
- **to identify relevant theories and terminology** connected to “professional noticing” (through content analysis).
- to identify **transversal aspects of “professional noticing”** through content analysis.
- **to gain insights how “professional noticing” and entrepreneurial competence development** are connected and how competence development could be reinforced through professional noticing (through content analysis).
- Creating an **agenda for further research** in the PROMISE project.

2.1

Used databases and search tool

For literature search in English and German language, the a “**smart citation index**” called **scite.ai** was used.



In 2021, scite has a database of **more than 880 million classified citation statements**, including open access repositories and publishers like Sage, Wiley, Cambridge University Press, etc. Scite provides a variety of tools common to other citation platforms such as Scopus, Web of Science or other information retrieval software. These also include **a literature searching functionality**, which was used for this literature review. The

citation statements shown in the search results are accompanied by surrounding citation context. This makes it easy to check in a very fast way if the found papers are relevant for the questions to answered through the literature review. Furthermore, the “**scite assistant**”, a large language model provided by scite, was used to identify relevant literature.

2.2

Conceptual structure

For this literature review, the conceptual structuring is based on the **point of view** that there are **transversal aspects** of “professional noticing”, that can be transferred to various disciplines. Originally, the method was **tested in the field of teacher professionalization**, later it was adopted in the field of **health professionals**.

Therefore, we want

to find answers to the

following question:

- How is professional noticing defined?
- Which theories are connected to professional noticing?
- What are the transversal aspects of professional noticing?
- What kind of learning settings are supporting the professional noticing skill development?

The PROMISE team believes that professional noticing also can be **adopted to the professionalisation of entrepreneurs**. The central idea is to find how the development of entrepreneurial skills is connected to professional noticing skills.

The question we want to answer through the literature review is:

How does professional noticing contribute to becoming an entrepreneur?

In order to answer this question, several other questions need to be answered first:

- How is “entrepreneurship” defined? What are entrepreneurial skills?
- What are aspects of the entrepreneurial processes related to professional noticing?
- How can professional noticing support entrepreneurship skills development?

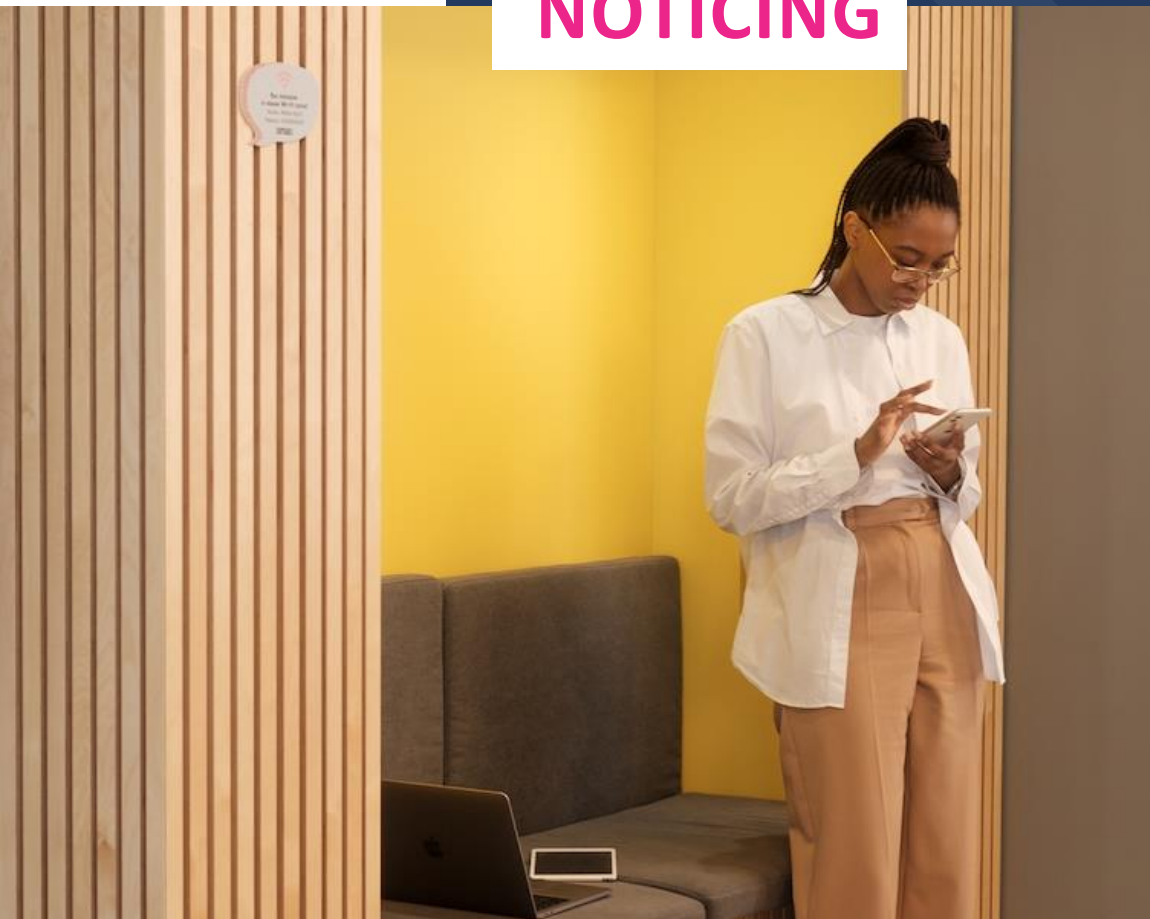
Furthermore, the PROMISE team believes that professional noticing of entrepreneurs can be **scaffolded in higher education classes through learning settings, that are dedicated to developing professional noticing skills**. Therefore, another question we want to answer in the literature review is: What kind of learning settings are supporting the professional noticing skill development?

There also is a specific aspect that we do NOT want to attend to in the literature research: Very important in this literature search is, that we **DO NOT investigate how teachers/lecturers in entrepreneurship education can be professionalized by using professional noticing**. The target group, which should use professional noticing are entrepreneurship students. The role of the teachers is to support the students in developing professional noticing skills. They provide suitable educational settings for the skill development.



03

PROFESSIONAL NOTICING



PROFESSIONAL NOTICING



3.1 Definition

“Every observation made speaks as much about the observer as it does about what is observed. Reality is not an experience; it is an argument in an explanation”
(Mason 2021 citing Maturana 1988).

When **developing from a novice to an expert** in a field and also when **acting as an expert in a field**, professional noticing is a crucial factor. **To act professionally**, it is necessary to notice salient aspects (like significant deviations from the anticipated flow of events) and **to be able to respond** confidently, without delay and appropriately (Rooney & Boud 2019, Jacobs et al., 2010). This includes the **observation, identification** of salient aspects, their **interpretation** as

well as **making an informed decision how to respond**. **Novices** usually have **difficulties in noticing salient aspects when observing** a certain situation or artefact. Consequently, they **cannot respond professionally** in practice. Noticing is an **intentional** act, that **can be learned** through a variety of activities on campus or at work. Furthermore, **noticing promotes learning** itself (Rooney & Boud, 2019).

Prerequisites for

professional noticing are

- **Intention to notice and to learn** (connected with self-direction and self-regulation of learning)
- **Mindfulness, being attentive** (Mason, 2002)
- **Professional knowledge**: Propositional and procedural (Rooney & Boud, 2019)

3.2

Professional noticing in higher education

In higher education, the **students are novices** to a certain field and want to develop professional competence. Without professional noticing skills, students **won't be able to transfer** what they have learned **into practice** and **operate successfully at the workplace** (Rooney & Boud, 2019). Therefore, it is crucial to support the students in developing professional noticing skills and not only to have an intention to

notice when observing, but also got build practical professional knowledge. Latter is also called "**professional vision**" (Goodwin, 1994) or a "**professional frame**" (Borich, 2016), which is used to make sense out of identified aspects in a practical situation. Both terms describe the capacity to "read" unfolding actions in a specific professional context.

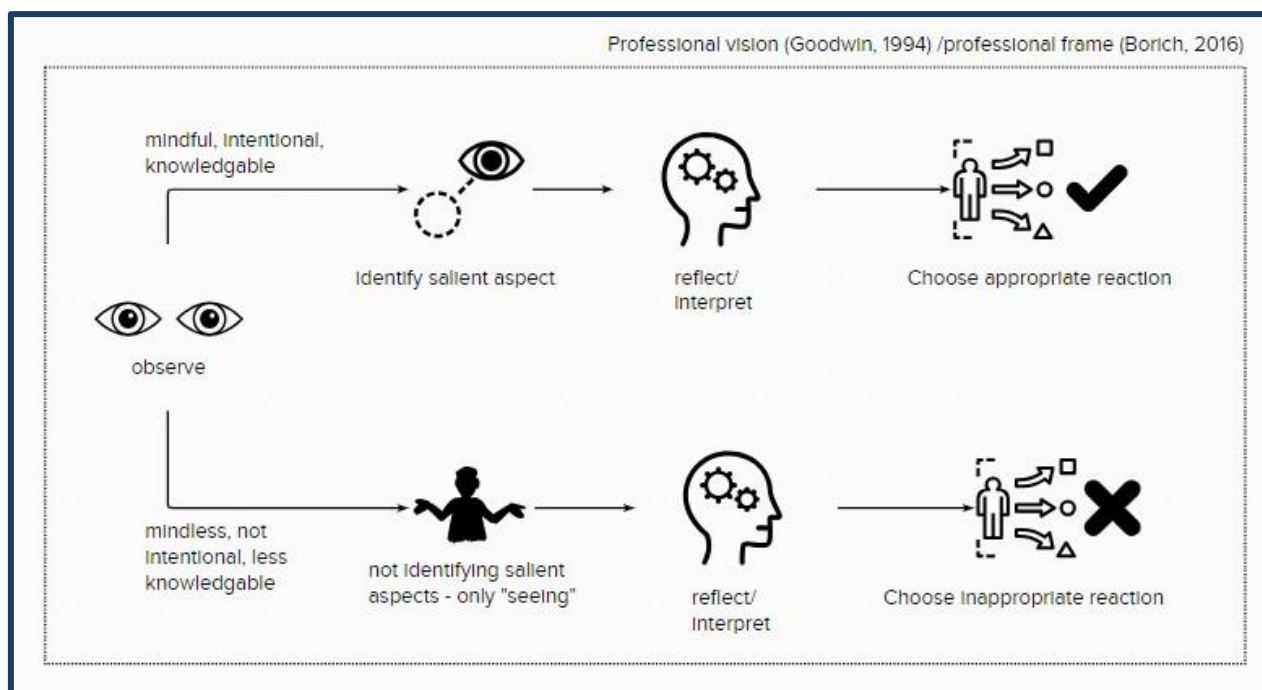


Figure 1: Professional noticing is based on observation but observing alone doesn't guarantee that salient aspects are noticed, and that sense is made of what is observed within a social context or community of practice.

3.3

Professional vision

Laypersons are not able to see the same aspects as experts do in a certain field. Experts and laypersons may see the same phenomenon but interpret it differently. A **community of competent practitioners perceive and categorize phenomena in similar ways** that are relevant to their work, tools, and artifacts that constitute their profession (Goodwin, 1994). For example, two practitioners from the same

profession who have never met each other before notice similar aspects when observing a specific situation. They can engage in a discussion about the interpretation of what was noticed. A **novice isn't part of this community yet**, as they are not able to see the world in the eyes of an expert and therefore **cannot contribute to discussions** in the field of the profession.

Professional vision can be developed through the following practices (Goodwin, 1994):

Use of coding schemes: Coding schemes are categories relevant to a certain profession. The use of coding schemes helps to organize the **perception of nature, events, or people** within the discourse of a profession. The coding scheme provides an orientation toward the world. A straight-forward example for this process is scientific work: *„In order to generate a data set, collections of observations that can be compared with each other, scientists use coding schemes to circumscribe and delineate the world they examine“* (Goodwin, 1994, p. 3). For professional vision it needs the knowledge about coding schemes as well as skills of how to identify if a phenomenon or artifact fits a certain category. It might be necessary to use tools to identify the right category.

Highlighting practices: Some features and aspects of a phenomenon or artifact can be difficult to see. To make them visible to others, and to show others the features/aspects and therefore evidence for a certain categorization, highlighting is used. An example: *„Faced with such a dense perceptual field, workers in many settings highlight their documents with colored markers, handwritten annotations, and stick-on notes. In so doing they tailor the document so that those parts of it which contain information relevant to their own work are made salient.“* (Goodwin, 1994).

Articulation of visual representations to organize perception: Graphic representations are central for the professional discourse in many fields: *„Instead of mirroring spoken language, these external representations complement it, using the distinctive characteristics of the material world to organize phenomena in ways that spoken language cannot—for example, by collecting records of a range of disparate events onto a single visible surface.“* (Goodwin, 1994, p. 611). An example for visual representations are maps in the archaeology profession. Maps are one form of professional literacy that constitute archaeology as a profession.

Next to the noticing practices outlined by Goodwin (1994),

Rooney & Boud have identified 3 main forms of noticing.

Noticing in context: Usually, multiple professional practices happen in authentic situations. The scope of **practices that constitute a domain and how they are connected** can be **identified in the messiness of everyday professional situations**. When noticing in an (authentic) context, professional practices and **how they manifest in reality** are identified by the observer. Observers **not only notice isolated activities** but activities in an unfolding context. There are three dimensions for noticing in context according to Lasater (Lasater, 2007):

Focused observation:
The observer knows where to look and what to look at, monitors a wide variety of features/aspects to uncover useful information.

Recognizing deviations from expected patterns:
Recognizing not only the most obvious, but also subtle patterns and deviations from expected patterns during observation and use them to judge the situation.

Information seeking:
Looking for information in observation to plan a reaction or intervention.

Noticing of significance: There are **deviations from routine situations** noticed during observation. Significance is noticed and it is **evaluated in action** what to do about the unexpected situation: *“Experienced professionals notice significant deviations from the anticipated flow of events and will initiate responses confidently and without delay”* (Rooney & Boud, 2019).

Noticing learning: There is a cycle of noticing, reacting, reflecting on the outcome of the reaction in the situation, leading to further noticing, reacting, reflecting. Noticing is a central element of reflection and connected to **learning from reflective practice**, as described by Schön (1983). **Self-direction and self-regulation** are initiated or preceded by noticing. Noticing learning is as important for pre-service professionals as it is for continuing learning for experts.

3.4

What kind of learning settings are supporting the professional noticing skill development?

„Noticing, then, is both an intentional activity that can be learned [...] as well as an activity that promotes learning in itself [...]“ (Rooney und Boud, 2019, p. 443).

What pedagogical methods are needed to prompt different kinds of noticing? Professional noticing can be supported through work placements, tightly linked to coursework, or through on-campus learning experiences, which can be used as a preparation prior the placement or also as a substitution, if a placement is not possible. The pedagogical design needs to foster all three forms of noticing. It is not enough to expose students to the complexities of practice without equipping them with the tools to guide what they are expected to notice (e.g., structured observation guide). It

needs a **practice-based pedagogy** (Rooney & Boud, 2019). **Noticing of learning important, but often overlooked**, there is a career-long demand for professional learning and therefore noticing.

Examples for work placements: Internships, fieldwork, service learning – combined with the use of reflective journals, which aid noticing for learning. When **work-related activities are less tightly linked** to the course learning outcomes, the activities to promote noticing are often absent.



Case studies

Case studies are textual accounts of professional practice. They are requiring students to notice features. They should be more than brief, text-based description of a situation (would only allow cognitive noticing). They should not be decontextualized or abstract cases, because there is little opportunity for professional noticing.

Observations, job shadowing

Professionals engaged in authentic practice can be observed either at the workplace directly or captured on video. A teacher gives observations guides or verbal instructions and therefore helps novices to notice specific or salient features:

- Students should be prepared before the observation with a structured observation guide.
- **“Practicum booklets” or observation/noticing guides:** Guide them in their observation of experienced professionals in practical situations, including prompts.

Observations, job shadowing

Novices are exposed to aspects of practice through simulation and simulations are often used as “intermediate practice” instead of placements. Simulations represent a link between abstracted practices in coursework and full immersion of placement. It includes:

- **Noticing through observation, passive role of student:**
- Students observe a controlled situation (compared to a work placement) and prompted to notice through a structured observation guide.
- **Advantage of “passive observer”:** Being able to see the “big picture” without being “in” the picture (i.e. noticing of significance but not noticing in context), external overview, have critical distance to the action
- **Disadvantage of “passive observer”:** non-attention can diminish what they observed, they need to be attentive, therefore observer guides should be available before attending class
- **Structures observer guides:** contain a series of features of practice to look out for, including:
 - prompt to notice what they have learned from observing their peers
 - connect it with theory/key concepts they have already learned
 - structuring observation through prompt sheets, helps observers to focus more directly
 - not overdetermined that students are blind to anything not explicitly prompted
 - tailoring guides to the needs of the observers and noticing learning
- **Important:** Engage “passive” observers in debriefing and schedule enough time for debriefing, validation of importance of observing and helping students to develop learning intent

Observations, job shadowing cont.

- **Noticing through performing, active role of student:** Practicing noticing in context, caught up in the situation sometimes leads to missing significant features
- **The role of a facilitator:** Could be the expert and the facilitator at the same time, prompting student noticing through questioning and “noticing aloud” – guides acting students to take note of features in context and unfolding action.
- **Debriefing session:** Students engage in activities to make sense of what they have noticed (in action or as passive observers)
 - reveals if “passive” observers also noticed in context, for both the performing and the observing students,
 - revisiting the action, seeing what they have missed or misinterpreted (demanding task for facilitator, little time and high level of skill needed for debriefing),
 - use of records made during the simulation, students can ask questions
 - questions for performing students: Reflect their feelings, experiences, identify areas for improvement
 - Not too broad, will generate short responses
 - General climate of practical situation
 - How actors in practical situation behaved
 - “Passive” observers have more capacity to notice as they are not immersed in the situation as performers.
- **Important:** Engage “passive” observers in debriefing and schedule enough time for debriefing, validation of importance of observing and helping students to develop learning intent

3.5

Which theories are connected to professional noticing?

- Reflective Practitioner (Schön, 1983)
- Professional Vision (Goodwin, 1994)
- Professional frame (Borich, 2016)
- Teacher noticing: Noticing (Mason, 2002 and 2021), Professional Noticing of Children's Mathematical Thinking (Jacobs et al., 2010) and conceptualizations of teacher noticing by van Es & Sherin (2021)
- Situation specific skills in the teacher profession: Blömeke et al. (2015)

What are the transversal aspects of professional noticing?

In short, learning to notice in particular ways is part of the development of expertise in a profession.” (Jacobs et al., 2010, p. 170).

There are transversal aspects of professional noticing that apply to the development of expertise in various professions (Jacobs et al., 2010):

- **Attending to relevant details:** Professionals in various fields need to be able to focus their attention on important details and incidents within their domain of expertise. This involves being able to identify significant moments, patterns, or behaviors that are relevant to their practice (Jacobs et al., 2010). For example, in computer science, professionals may need to notice specific coding errors or identify patterns in data.
- **Interpreting and making sense of observations:** Professionals need to be able to interpret and make sense of the information they observe or notice. This involves analyzing and understanding the underlying meaning or significance of the observed phenomena (Jacobs et al., 2010). In different professions, this could involve interpreting data, analyzing patient symptoms, or understanding customer behavior.
- **Decision-making based on observations:** Professionals need to make informed decisions based on their observations and interpretations. This involves considering various factors, such as best practices, ethical considerations, and desired outcomes (Jacobs et al., 2010). For example, doctors make treatment decisions based on their observations of patient symptoms and test results, while engineers make design decisions based on their observations of system behavior.
- **Reflecting on and learning from observations:** Professionals should engage in reflective practice and continuous learning based on their observations. This involves critically analyzing their own noticing processes, evaluating the effectiveness of their decisions, and seeking opportunities for improvement (Jacobs et al., 2010). Reflective practice is essential for professional growth and development in any field.

It is important to note that while the specific content and context of professional noticing may vary across professions, the underlying processes and skills involved are similar. The ability to attend to, interpret, and make decisions based on observations is a fundamental aspect of professional expertise in any domain.

Rooney and Boud (2019, p. 442) underline that students need noticing to make an **effective transition into practice of various professions**: „While there is some discussion of noticing in discipline-specific literatures, we propose that it needs to be located as a central concern of higher education more generally given the increased emphasis on students gaining experience of practice through work-integrated learning in courses for which this was not previously expected (Cooper et al. 2010; Higgs et al. 2012). Without a well-developed capacity for noticing, students may not make an effective transition into practice, nor operate successfully within the world of practice.“

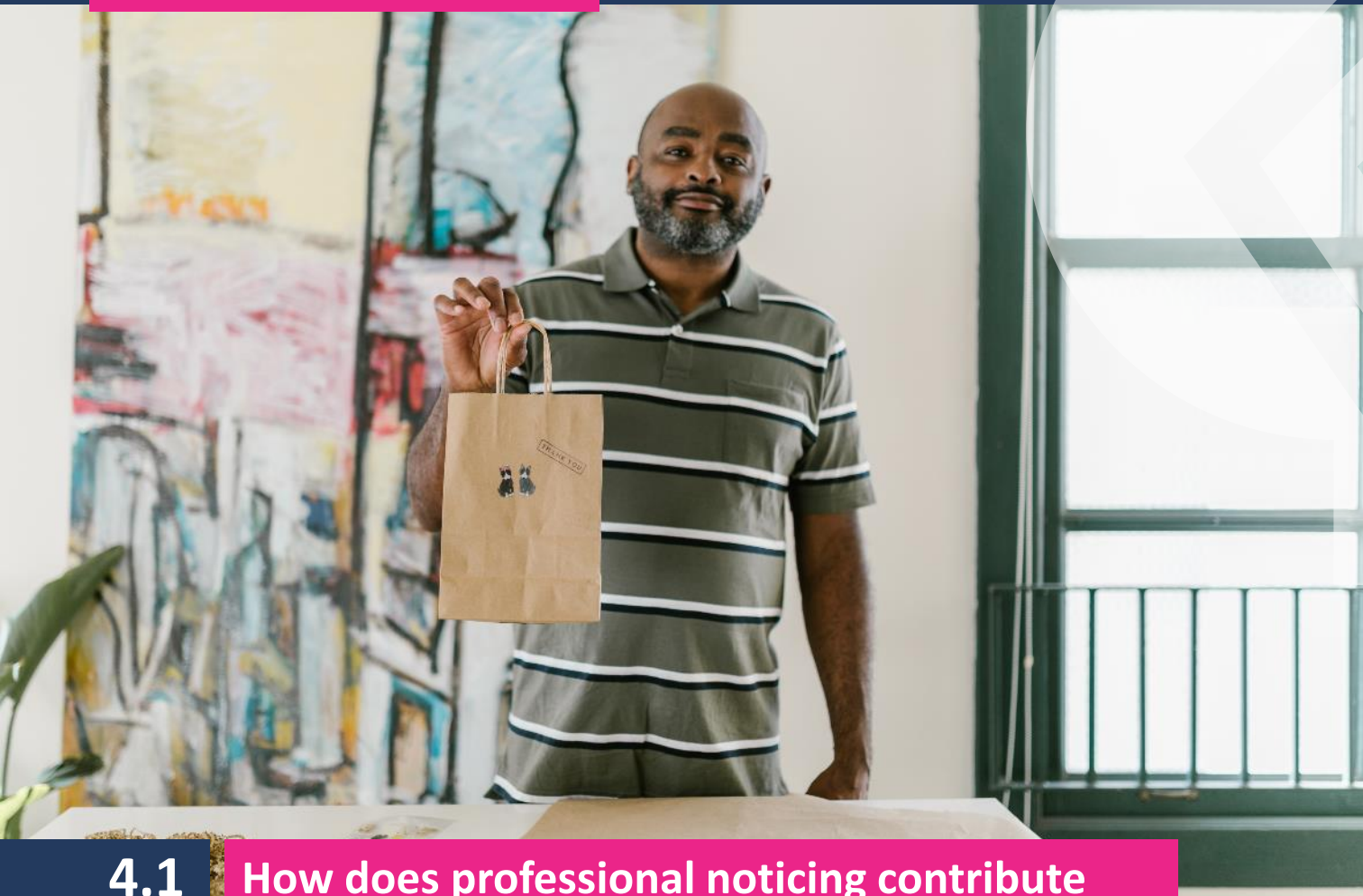


04

ENTREPRENEURSHIP & PROFESSIONAL NOTICING



ENTREPRENEURSHIP & PROFESSIONAL NOTICING



4.1 How does professional noticing contribute to becoming an entrepreneur?

Living in a more and more connected, complex, agile, and globalized world, entrepreneurs need to handle risks and non-predictive situations.

Unlike traditional causal reasoning in entrepreneurship, which relies on predicting and controlling outcomes, the effectuation theory focuses on leveraging available resources and co-creating opportunities with network partners. This approach is particularly relevant for entrepreneurs who

are operating in dynamic and uncertain environments, as it allows them to adapt and respond to changing circumstances (Gangi, 2017). Therefore, we decided to utilize the effectuation theory in the PROMISE entrepreneurship education learning and teaching scenarios.



4.2

About the effectuation theory

To find a learnable and teachable “core” to entrepreneurship, Saras Sarasvathy studied several successful entrepreneurs. She found that they are using different kinds of logic of thinking in creating a new venture to the traditional managerial logic.

While the managerial logics, causal thinking and strategical thinking use given means respectively given and acquired means to achieve a predetermined goal, the successful entrepreneurs use entrepreneurial thinking to imagine possible new ends using their given set of means. She named this entrepreneurial thinking as Effectuation (Sarasvathy, 2001).

Effectuation is a form of expertise in entrepreneurship that is characterized by non-predictive decision making and the ability to leverage available resources to create opportunities in uncertain environments (Read et al., 2009). Effectuate entrepreneurs can identify and exploit opportunities through a process of effectual reasoning, which involves iteratively testing and adapting their ideas based on feedback

from the market (Welter et al., 2016). Effectuation provides a cognitive framework for entrepreneurs to navigate uncertainty and make decisions that are aligned with the principles of value co-creation (Read et al., 2009).

Effectuation is a cognitive approach and decision-making process that operates under the premise that entrepreneurs shape their own destiny through taking action and making things happen. The Effectuation theory describes five principles which entrepreneurs use in creating opportunities and solving problems by using the resources that are available to them, instead of making predictions and trying to plan for the future (effectuation.org, o. J.).



4.3

Principles of effectuation

The principles of effectuation can be adapted
by anybody (effectuation.org, o. J.):

01

Bird in the Hand Principle (Means)

Expert entrepreneurs start with who they are, what they know, and whom they know – that is their means and imagine possibilities they can achieve with those.

02

Affordable Loss Principle (Focus on Downside)

Instead of focusing the potential profits, expert entrepreneurs limit their risks by estimating what they afford to lose. Therefore, if the venture is unsuccessful, they can try another opportunity.

03

Crazy Quilt Principle (Co-Creation Partnerships)

Expert entrepreneurs are creating partnership with various key stakeholders, suppliers, and customers to reduce the uncertainty.

04

Lemonade Principle (Leverage Contingences)

Expert entrepreneurs embrace surprises, because in their view the unexpected can lead them to a valuable opportunity.

05

Pilot in the Plane Principle (Worldview)

Entrepreneurs generally choose their career because they want to be their own boss and choose their path. Expert entrepreneurs also focus on activities within their control. They feel that when you can control your future, you don't need to predict it.

Effectual cycle and the connected effectuation

Using these principles leads to dynamic, on-going effectual cycle illustrated in the picture above. Expert entrepreneurs use it in the early phases of the new venture creation where there is a lot of uncertainty about information, markets, product and the venture itself. Using the effectuation, expert entrepreneurs can gain customers and committed partners early, and further, with their resources and

viewpoints to create new means and new goals. Instead of a pre-set goal, expert entrepreneurs can use the gained new means and new goals to create a new venture in ways they hadn't expected, while embracing surprises as they present themselves and bring new possibilities (Read et al., 2009).

The researchers of the Hull University Business School made an extensive literature review on the Entrepreneurial skills.

Their analysis confirmed that there are specific skills known as "entrepreneurship skills" that are distinguishable from, but closely related to, established definitions of management and leadership skills. Entrepreneurship skills involve the ability to identify or create opportunities, take advantage of them, and possess a range of skills related to developing and executing business plans to realize those opportunities. Research indicated a positive connection between entrepreneurship skills and certain measures of business success. However, the impact of education, training, or support programs aimed at promoting entrepreneurship on business performance is limited. This suggests the need for further experimentation and systematic evaluation (Johnson et al., 2015).

The evidence showed that some entrepreneurship skills can be taught or learned. However, entrepreneurs tend to learn less effectively through traditional didactic approaches commonly used in education. The most effective methods for

developing entrepreneurship skills involve experiential learning that focuses on practical tasks and real-world business problems. Effective approaches primarily rely on experiential learning (Johnson et al., 2015)

Chell, E. (2013) identified 22 entrepreneurial skills related to business creation. There is considerable research directed at identifying and understanding the (in particular) cognitive capabilities of entrepreneurs in this process. This research relies on opportunity recognition which is the dominant theory in entrepreneurship. Chell (2013) develop a coherent framework in which to understand entrepreneurship skills based on the contributions of a range of researchers (Chell, 2013).

Chell's entrepreneurship skills were simplified to a table by Johnson et al. (2015). The table demonstrates the broadness of the categories of the entrepreneurial skills, which can be in many cases be inter-related.

One paper was found, referring to “professional vision” in entrepreneurship. Since “professional noticing” and “entrepreneurship” led to zero results, this is the next best iteration for finding existing research on professional noticing in entrepreneurship.

Professional vision is an important theoretical foundation for professional noticing and therefore a relevant keyword. In Campbell’s paper „Entrepreneurial uncertainty in context: an ethnomethodological perspective”(2020), the author refers to “professional vision” through an ethnomethodological approach and underlines the importance of shared sense-making in entrepreneurship:

By attending to the specificities of entrepreneurial work in context, this study adds to our understanding of what entrepreneurs actually do, and, by extension, it enriches existing theories of entrepreneurship. It transforms our understanding of recognized entrepreneurial concepts, such as sensemaking, by revealing their micro-foundations to be socially constructed in the turn-by-turn interactions of teammates by and for themselves

The research results originally included 3 papers all in all,

but 2 papers were discarded because of the following reasons:

- One study is referring to professional noticing of teachers in entrepreneurship education (Kaminskiene et al., 2023).
- The other study is referring to motivations and barriers to entrepreneurship in journalism, professional vision was mentioned, but not in the focus of the study (López-Meri et al., 2021).

4.6

How is professional noticing contributing to becoming an effectuate entrepreneur?

According to Bazerman's ideas from 2014, entrepreneurs and business leaders should develop the skill of paying close attention to their surroundings and picking out important details in order to make smart business decisions. This skill can be developed through "professional noticing". Being able to professionally notice things helps entrepreneurs spot and take advantage of resources, networks, and opportunities. These aspects are crucial for the entire entrepreneurial journey and for using practical and effective approaches to achieve their goals.



05

QUANTITATIVE ANALYSIS

OF RESEARCH HISTORY IN

“PROFESSIONAL NOTICING”



5.1

Quantitative analysis of research history

in “professional noticing”

A first research on scite.ai showed, that this English term “professional noticing” was also used in several articles in other languages than English. Nevertheless, also translated versions of the term have emerged, for example in German, professional noticing is often referred to as “professionelle Wahrnehmung”.

Following keywords

were used:

- “Professional noticing”
- “Professionelle Wahrnehmung”
- “Professional noticing” and “entrepreneurship”
- “Professional vision” and “entrepreneurship”

A first analysis of the search results had shown that especially in **teacher education**, professional noticing was also called **“teacher noticing”** and sometimes authors only referred to the method as “teacher noticing”. As we do not focus on teacher education in this literature review, “teacher noticing” was discarded as a keyword. **“Professional noticing” and “entrepreneurship”** as well as “Professional vision” and “entrepreneurship” **generated zero results** in the scite search. Therefore, it was **necessary to find different terms**, which might have been used in entrepreneurship research and entrepreneurship education research. This led to a further question, which was added to the conceptual structuring: **“Which theories are connected to professional noticing?”**

Keywords	Number of search results	Number of relevant search results	Database
“Professional noticing”	185	175	Scite.ai
“Professionelle Wahrnehmung”	37	37	Scite.ai
“Professional noticing” and “entrepreneurship”	0	0	Scite.ai
“Professional vision” and “entrepreneurship”	3	1	Scite.ai



5.2

Criteria for retaining or discarding literature

- Removing duplicates
- Removing search publications, which only mentioned “professional noticing” was only mentioned in author bios and not in the paper itself
- Removing search results, which were corrections to papers
- Removing a search results, which is a book review an not actually about the paper (which wasn’t in the search results itself)
- Removing a search results, which was not about professional noticing, just accidentally slipped in (randomly used “professional noticing” in the paper but wasn’t about professional noticing)
- Removing search results with wrong metadata
- All in all, 10 publications were removed according to these criteria in the search “professional noticing” and “Professionelle Wahrnehmung”. In the search “Professional vision” and “entrepreneurship” two criteria for discarding literature were added:
- No “teacher noticing” in entrepreneurship education
- “Professional vision” and “noticing” need to be a focal point of the study.
- Therefore, 2 out of 3 papers were discarded.

4.5

Cross-checking search results

The project partners shared contributed 13 relevant literature sources on “professional noticing” and on “entrepreneurship”.

The six shared literature sources on “professional noticing” were used to cross-check the quality of the search results on scite. Five of the six source could be found in the scite search results. One source wasn’t found, because it was a dissertation and not indexed. The seven shared literature sources on “entrepreneurship” were not found in the search “Professional vision” AND “entrepreneurship” in scite. The literature sources shared by the consortium members did refer to entrepreneurship education in

general and not specifically to professional noticing or professional vision. One of the shared literature sources specifically referred to “recognizing opportunities”, which is a recurring research topic in entrepreneurship education, where we could find links to professional noticing. Among other factors, this led to the decision of the Consortium to choose **the “effectuation” perspective on entrepreneurship** as a focus for further research

5.4

Timeline of publications on “professional noticing”

From 2010 on, professional noticing was more and more often mentioned in research publication, peaking in 2021. The decline in 2023 is due to missing data of publication in 2023, since the review was conducted in June 2023.

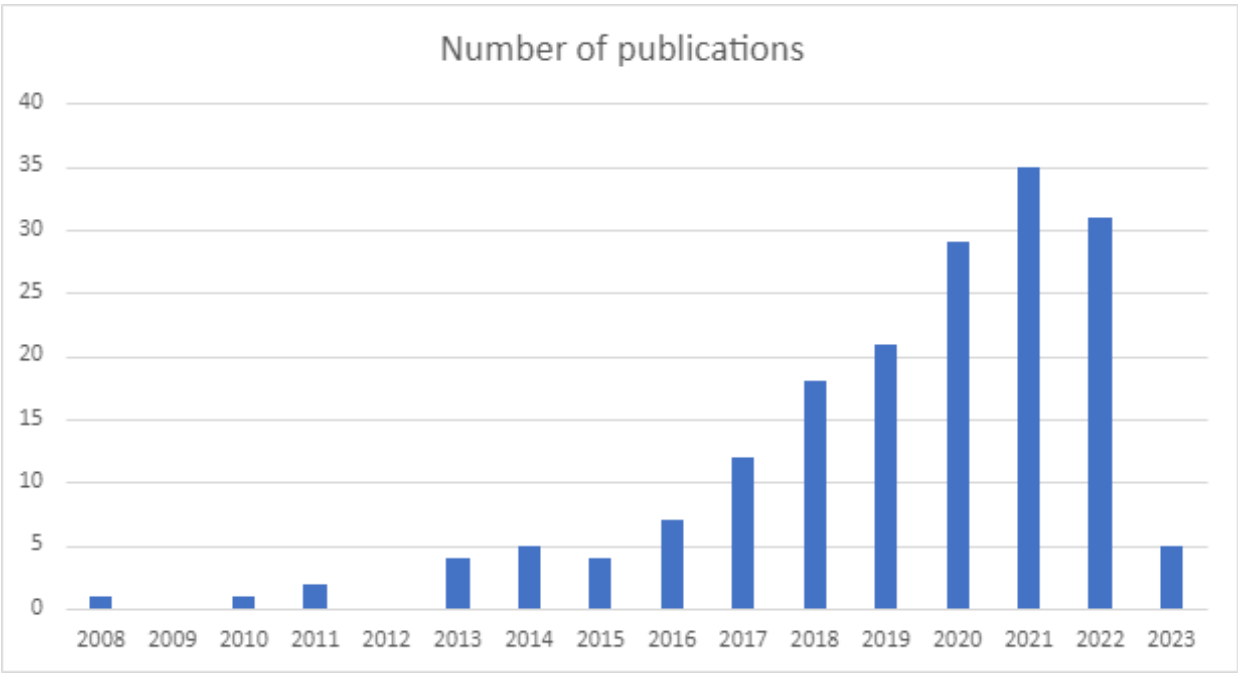


Figure 4: In the last decade there is a rise of publications about "professional noticing".

5.4

Timeline of publications on “professional noticing”

Also “**professionelle Wahrnehmung**” was mentioned more often since 2016:



Figure 5: Professionelle Wahrnehmung" was first mentioned in 2006, earlier then "professional noticing".

Interestingly, 2006 “professionelle Wahrnehmung” was first mentioned by Baumert & Kunter, building on the works of Schön (1983) as well as early works of Sherin, who later on published various papers on teacher noticing.

Professional fields publishing research
on “professional noticing”

Until now, “**professional noticing**” mostly was used in papers on subject-specific pedagogy and instructional design, but also in the health profession.

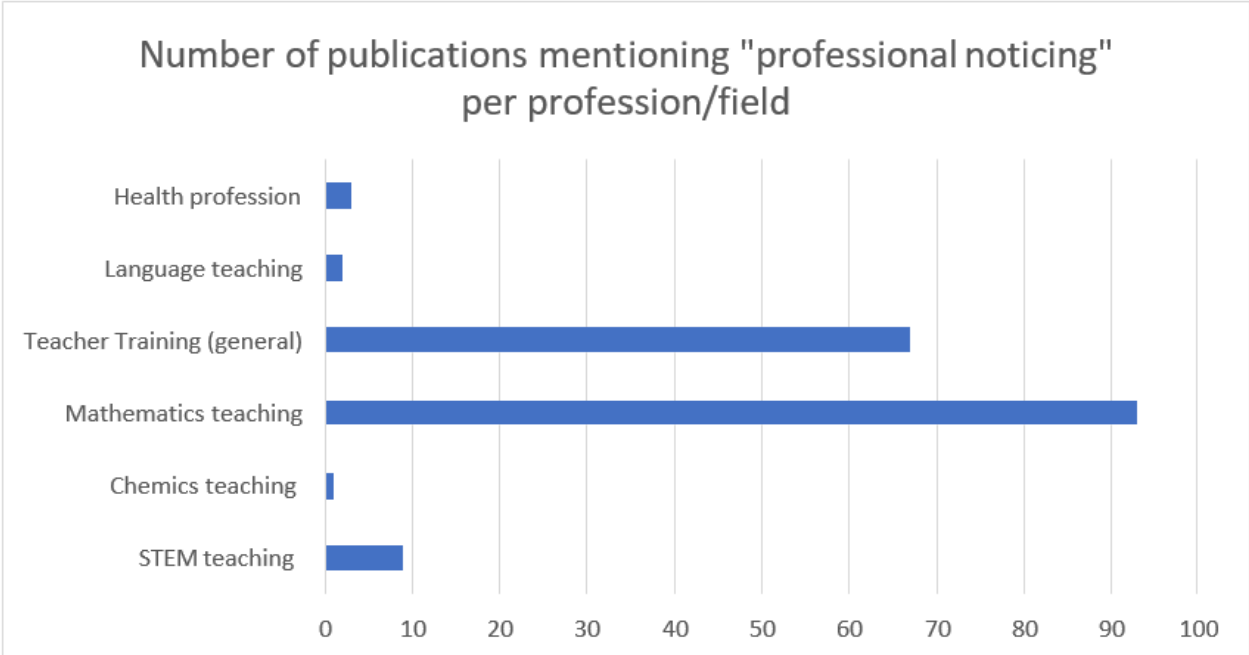


Figure 6: Most papers mentioning “professional noticing” were published in the field of mathematics education.



5.5

Professional fields publishing research

on “professional noticing”

Also, “**professionelle Wahrnehmung**” was mostly mentioned in mathematics education research:

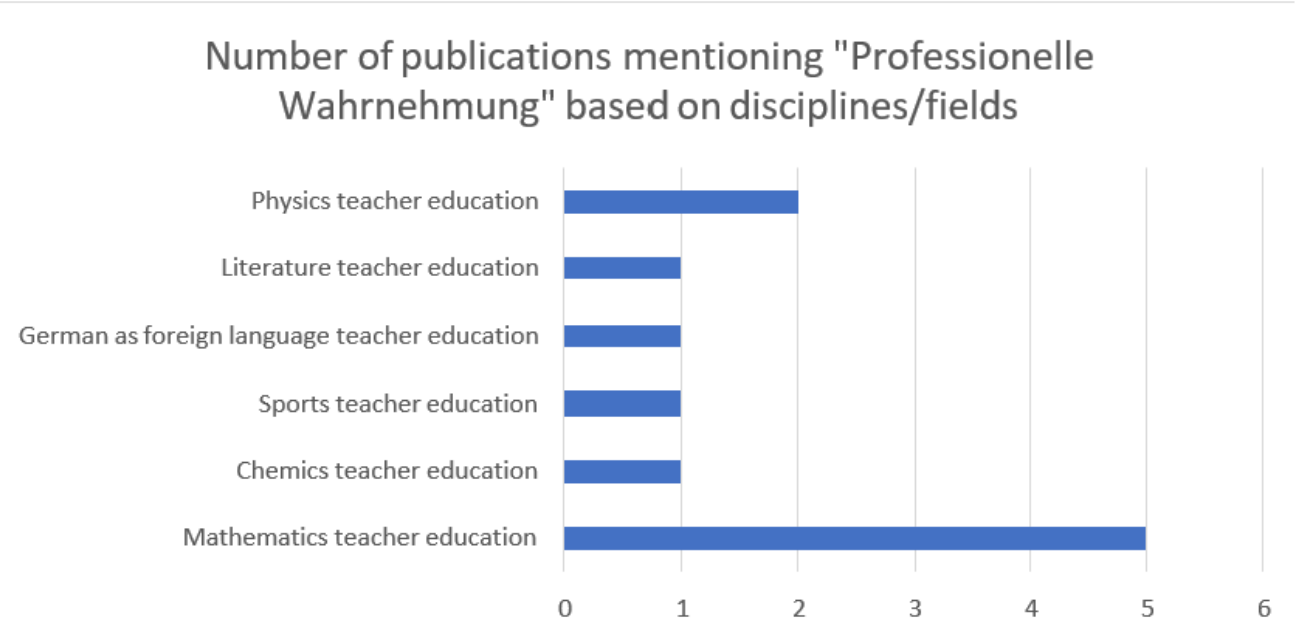


Figure 7: Also, the search for "professionelle Wahrnehmung" showed that teacher education mostly used the term in their research. education.

5.6

“Professional noticing” and digital tools

A common methodology for professional noticing is recording videos, video analysis and eye-tracking. All in all, 17 studies make use of video-technology. Furthermore, one

study used an application, another study used a technology-enhanced environment and one study used blogging as a tool for professional noticing.



06

RESEARCH AGENDA



RESEARCH AGENDA



In the literature review, it was found that professional noticing enables individuals to pay attention to and analyze their experiences, actions, and interactions in relation to their professional identity.

Therefore, we want to

further investigate through

empirical research within

the PROMISE project:

- How can professional noticing contribute to various phases of the effectual cycle?
- “Observation” in professional noticing is mostly based on visual senses. Which other senses are relevant to professional noticing in entrepreneurship? How can a more holistic perspective be gained?
- What are main aspects of “professional vision” in entrepreneurship?
- How can “professional vision” be identified through professional noticing?
- How can existing entrepreneurship education be adapted to support the systematic development of professional noticing skills?
 - Which teaching and learning settings in entrepreneurship education support the development of professional noticing skills?
- How does
 - the experience level of the target group
 - the complexity level of learning outcomes of the entrepreneurship program (to be considered in a learning and teaching design)support the development of professional noticing skills?



07

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